

Design document for disclosure market experiment

Purpose: To study the effect of disclosure regulations on market outcomes including price complexity and shrouding, consumer and producer surplus, and volume of goods sold.

Experimental overview: We propose a series of studies in which participants will act as buyers or sellers. Sellers will choose the pricing structure for their product and are compensated based on profits (quantity sold x price). Buyers will choose to buy a good from one of the sellers. They are compensated based on the product’s quality (which is the same across products) and the price paid. Markets in different experimental conditions will vary in terms of disclosure rules, that is, the information that is automatically provided.

Our proposed experimental conditions are as follows:

Full information condition (baseline)	Sellers will choose values for each of 10 prices. All of those prices will be revealed. Each buyer will take a “comprehension” quiz, which requires them to recall those prices. Buyers who perform well on the quiz will receive a small bonus.
Price-1 condition	Sellers will choose values for each of 10 prices. Price #1 will be revealed. Buyers can search for information on the other prices for 10 tokens each; if they search, the prices will be revealed in order. Each buyer will take a “comprehension” quiz, which requires them to recall those prices. Buyers who perform well on the quiz will receive a small bonus.
Comprehension condition	Price-1 condition, plus: For each buyer that does not successfully recall at least 5 fees, the corresponding seller is fined 50 tokens. The buyer will lose the purchase.
Performance condition	Price-1 condition, plus: Each seller has a 25% chance of being “audited” each round. Sellers whose products have a total price above a given value are penalized 3 times the difference from the value.

Timeline

		Repeated 4 times, with different order of disclosure conditions for each session					
Informed consent [In person, from contractor]	General instructions (applicable to all disclosure conditions)	Condition specific instructions	Practice rounds (as buyer and seller)	10 game rounds	Survey, including, risk preferences, numeracy, and basic demographics	CFPB disclosure (including meta-experiment) [In person]	Payment [In person]

Experimental detail:

- Disclosure conditions: We will run three markets per session. In each session, each market will experience all four disclosure conditions. We will track the order of disclosure conditions across sessions, making sure that all 24 combinations are played once.

- Market:
 - Each market will be comprised of 2 buyers and 2 sellers. Participants will be randomly assigned to a market group each round.
 - Additionally, the role of buyer and seller will be randomly selected each round.
 - All participants will be anonymous.

General Instructions (Applicable to All Disclosure Conditions and Roles)

Introduction

Values may be modified to allow for problems that arise during pretesting.

Welcome to our research study.

In this study, you will be playing 40 rounds of a game. Each round, participants will be assigned one of two roles: a buyer or a seller. Sellers will decide on prices for an object they are trying to sell. Buyers will decide which seller's object they want to buy. You will be randomly reassigned to being a buyer or a seller each round.

The game is divided into four parts, each of which lasts ten rounds. There are different rules for each set of 10 rounds. We will provide more instructions about each of the parts as we reach them.

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[next]

First, let's review what will happen. In this game, each participant will be assigned one of two roles: a buyer or a seller. All roles will be reassigned each round.

Every time you play as a seller, you will be trying to sell an object worth 500 tokens. You will choose prices for the sale of this object.

Every time you play as a buyer, you will choose which seller's object you want to buy. You will also be asked to remember the prices for the object that you bought.

You will be paid based on the choices that you make in this study.

Sellers will earn more money when they sell a greater number of objects at a higher price.

Buyers will make more money when they buy an object at a lower price.

[next]

You have just been assigned to your group for the first round. We will describe the rules for this round on the next few pages. There will be new instructions after 10 rounds.

[next]

Seller instructions

Contains some condition-specific text. This text should be displayed for each participant as appropriate.

Imagine that you are playing as a **seller**. Each round, you will be placed into a group with two buyers and one other seller. You will be asked to sell an object that has a value of 500 tokens. The other seller in your group will be selling an identical object with the same value.

Your job is to choose prices for this object. You have the chance to set 10 prices for this object. Each price can be set between 0 and 100. An example is shown in the table below.

Price 1	26	Price 6	25
Price 2	64	Price 7	13
Price 3	72	Price 8	0
Price 4	0	Price 9	83
Price 5	99	Price 10	17

Full information condition: Buyers will see all of the prices that you have assigned. If a buyer chooses to buy your product, they will be asked to report the values that you set for all 10 prices.

Price-1 condition: To start, buyers will see only the price that sellers have assigned to Price 1. For example, if you used the prices above, buyers would know that price 1 for your object was 26. In order to see the other prices, buyers will have to pay a fee of 10 tokens per price. If a buyer chooses to buy your product, they will be asked to report the values that you set for all 10 prices.

Comprehension condition: To start, buyers will see only the price that sellers have assigned to Price 1. For example, if you used the prices above, buyers would know that price 1 for your object was 26. In order to see the other prices, buyers will have to pay a fee of 10 tokens per price. If a buyer chooses to buy your product, they will be asked to report the values that you set for all 10 prices.

There is a 50% chance that the buyer's report will affect their purchase. Specifically, in 50% of the rounds, the buyer's report will get checked. If they have not exactly report at least 5 of the prices on this report, you will lose 50 tokens and they will not buy the object. If they exactly report 5 or more of the prices, they will purchase the object and you will be paid as normal.

Performance condition: To start, buyers will see only the price that sellers have assigned to Price 1. For example, if you used the prices above, buyers would know that price 1 for your object was 26. In order to see the other prices, buyers will have to pay a fee of 10 tokens per price. If a buyer chooses to buy your product, they will be asked to report the values that you set for all 10 prices.

In addition to this report, there is a 25% chance that your pricing scheme will be "audited." In the case of an audit, if the sum of your prices is above 500, you will lose three times the difference between your price and 500. For example, if the sum of your prices was 600 tokens and you were audited, you would lose 300 tokens [$300 = 3 * (600 - 500)$]. If the sum of your prices was below 500, there will be no effect.

All conditions: For each object you sell, you will receive the sum of the prices you set. For example, if you sold to one buyer using the prices above, you would receive 399 tokens ($399 = 26 + 64 + 72 + 0 + 99$

+ 25 + 13 + 0 + 83 + 17). If you sold to both buyers, you would receive 798 tokens. If you did not sell any objects, you would receive 0 tokens.

[next]

Seller comprehension check

Q1. Correct answers are: Full information condition = “All of the prices” and all other conditions = “Only Price 1”

If the answer is correct, move on to the next question. If the answer is not correct, display the appropriate error message. Specifically:

Full information = “In this game, buyers will see all of the prices that you set.”

All other conditions = “In this game, buyers will automatically see only price 1. They can see other prices by searching for those prices.”

SellerQ1. What information will buyers automatically see from you?

- All of the prices
- Only Price 1
- I don't know

[next]

Q2. Correct answers are: Comprehension = “I will lose 50 tokens + I will not sell them the object” and all other conditions = “Nothing.”

If the answer is correct, move on to the next question. If the answer is not correct, display the appropriate error message. Specifically:

Comprehension = “In this game, buyers must report at least 5 prices correctly. Otherwise, you will lose 50 tokens and will not make the sale.”

All other conditions = “In this game, buyers' reports have no effect on making a sale or your payoffs.”

SellerQ2. What happens if a buyer who tries to purchase my object reports only 3 out of 10 prices correctly? (Mark all)

- Nothing
- I will lose 50 tokens
- I will not sell them the object

[next]

Only display this question before round 1 – do not display before rounds 11, 21, or 31.

Q3. Correct answer is “0 tokens”

If the answer is correct, move on to the next question. If the answer is not correct, display “Remember that you only receive tokens if you sell an object. If you do not sell to any buyers, you will receive 0 tokens.”

SellerQ3. How many tokens will you receive if you don't sell an object?

- 0 tokens
- 500 tokens
- It depends on the prices I set

[next]

Only display this question before round 1 – do not display before rounds 11, 21, or 31.

Q4. Correct answer is “It depends on the prices I set”

If the answer is correct, move on to the next question. If the answer is not correct, display “Remember that you will receive tokens according to the prices you set. In the case of a sale, the higher the price, the more tokens you will receive.”

SellerQ4. How many tokens will you receive if you sell an object?

- 0 tokens
- 500 tokens
- It depends on the prices I set

[next]

Buyer instructions

Contains some condition-specific text. This text should be displayed for each participant as appropriate.

Now imagine that you are playing as a **buyer**. Each round, you will be buying an object from one of the two sellers in your group. Both sellers are selling an identical object that is valued at 500 tokens. However, they may have chosen different prices for that object.

Full information condition: You will see all of the prices from each seller. When you buy the object, you will be asked to report the prices from the seller whose object you bought. If you correctly report at least 5 of these prices, you will receive 10 tokens.

Price-1 condition: To start, you will see only Price 1 from each seller. In order to see the other prices, you will have to pay a fee of 10 tokens per price. When you buy the object, you will be asked to report the prices from the seller whose object you bought. If you correctly report at least 5 of these prices, you will receive 10 tokens.

Comprehension condition: To start, you will see only Price 1 from each seller. In order to see the other prices, you will have to pay a fee of 10 tokens per price. When you buy the object, you will be asked to report the prices from the seller whose object you bought. There is a 50% chance that this report affects your purchase.

Specifically, in 50% of the cases, if you correctly report fewer than 5 of the prices, you will lose the object and receive 0 tokens. If you report at least 5 prices, the purchase will occur as usual. In the other 50% of cases, if you do not correctly report at least 5 prices, there will be no effect on the purchase.

Performance condition: To start, you will see only Price 1 from each seller. In order to see the other prices, you will have to pay a fee of 10 tokens per price. When you buy the object, you will be asked to

report the prices from the seller whose object you bought. If you correctly report at least 5 of these prices, you will receive 10 tokens.

All conditions: For each object you buy, you will receive 500 tokens minus the total of the prices. For example, if the prices were set at 350, you would receive 150 tokens.

[next]

All except full information: An example is shown below.

Imagine that the following prices were chosen...			Then you would see...		
	Seller 1	Seller 2		Seller 1	Seller 2
Price 1	26	15	Price 1	26	15
Price 2	64	35	Price 2	[reveal next price for 10 tokens]	
Price 3	72	86	Price 3		
Price 4	0	45	Price 4		
Price 5	99	92	Price 5		
Price 6	25	74	Price 6		
Price 7	13	22	Price 7		
Price 8	0	10	Price 8		
Price 9	83	0	Price 9		
Price 10	17	84	Price 10		

- I want to purchase the object from Seller 1.
- I want to purchase the object from Seller 2.

[next]

Please report the prices that you saw from [Seller 1 / Seller 2].

Price 1	[enter price]
Price 2	[enter price]
Price 3	[enter price]
Price 4	[enter price]
Price 5	[enter price]
Price 6	[enter price]
Price 7	[enter price]
Price 8	[enter price]
Price 9	[enter price]
Price 10	[enter price]

[next]

If comprehension condition AND at least 5 of the prices did not exactly match: The prices you reported do not match the seller's prices. You do not receive the object this round. You receive 0 tokens.

Otherwise: You purchased the object for a total of [#] tokens [and passed the quiz for an additional 10 tokens]. You receive [#] tokens this round.

[next]

Practice Rounds

Assign participants such that everyone plays three rounds as a buyer and three rounds as a seller. Keep them in the same role continuously for these rounds.

First we will do a few practice rounds. You will not gain or lose any tokens this round based on your decisions.

[Show same screen as the Game Rounds below].

Game Rounds

Both buyers and sellers. Repeat for 10 rounds.

Throughout, there will be text that indicates that you are waiting for the other players to finish making their choices. These text screens should disappear automatically.

Waiting for other players to begin the game...

Seller game screen

[0] represents an open text box that is pre-populated with 0.

This round, you are a seller. Please enter your prices below.

Price 1	[0]
Price 2	[0]
Price 3	[0]
Price 4	[0]
Price 5	[0]
Price 6	[0]
Price 7	[0]
Price 8	[0]
Price 9	[0]
Price 10	[0]

[next]

Please wait for buyers to make their decisions...

Buyer game screen

If more than 45 seconds passes, display text saying, "Please make your decision in the next 30 seconds."

This round, you are a buyer. Please wait for sellers to enter their prices...

	Seller 1	Seller 2
Price 1	[show values as appropriate]	
Price 2	[reveal next price for 10 tokens]	
Price 3		
Price 4		
Price 5		
Price 6		
Price 7		
Price 8		
Price 9		
Price 10		

- ___ I want to purchase the object from Seller 1.
 ___ I want to purchase the object from Seller 2.

[next]

Please report the prices that you saw from [Seller 1 / Seller 2].

Price 1	[enter price]
Price 2	[enter price]
Price 3	[enter price]
Price 4	[enter price]
Price 5	[enter price]
Price 6	[enter price]
Price 7	[enter price]
Price 8	[enter price]
Price 9	[enter price]
Price 10	[enter price]

[next]

Seller summary screen

Personal summary:

of buyers who tried to purchase from you: [0 / 1 / 2]

of prices reported correctly from your buyers:

[Not applicable – No buyers]

Buyer 1: [X] of 10 – [Successful purchase]

Buyer 2: [X] of 10 – [Unsuccessful purchase]

Total profits this round: [#] tokens

[next]

Buyer summary screen

Personal summary:

of prices you reported correctly: [X] of 10 – [Successful purchase]

Total profits this round: [#] tokens

[next]

All summary screen

Round summary:

This round, sellers used the following prices:

	Seller 1	Seller 2
Price 1	26	15
Price 2	64	35
Price 3	72	86
Price 4	0	45
Price 5	99	92
Price 6	25	74
Price 7	13	22
Price 8	0	10
Price 9	83	0
Price 10	17	84
Total price:	399	463

[#] buyers purchased from Seller 1.

[#] buyers purchased from Seller 2.

Price reports:

Buyer 1: [X] of 10 – [Successful purchase]

Buyer 2: [X] of 10 – [Unsuccessful purchase]

[next]

At the end of 10 rounds, re-randomize players into groups. Return to the seller and buyer instructions for the next disclosure condition.

Survey

Thank you, the games are now complete. Before we finish, we have a few questions to help us better understand how you make decisions and tradeoffs.

RiskQ1

If participant chooses "50% chance...", administer RiskQ2

If they chose "100%...", administer RiskQ3

This question measures risk preferences.

RiskQ1. Hypothetically, which would you prefer: a 50% chance of getting \$35, or a 100% chance of getting \$15?

A 50% chance of \$35

A 100% chance of \$15

[next]

RiskQ2 display is contingent on RiskQ1 = "50%..."

For any response, continue to NumeracyQ1

This question measures risk preferences.

RiskQ2. Hypothetically, which would you prefer: a 50% chance of getting \$35, or a 100% chance of getting \$17.50?

A 50% chance of \$35

A 100% chance of \$17.50

[next]

RiskQ3 display is contingent on RiskQ1 response = "100%..."

For any response, continue to NumeracyQ1

This question measures risk preferences.

RiskQ3. Hypothetically, which would you prefer: a 50% chance of getting \$35, or a 100% chance of getting \$10?

A 50% chance of \$35

A 100% chance of \$10

[next]

RiskQ4. How willing are you to take risks in your life, in general?

0
Not at all willing
to take risks

0

0

0

0
Very willing to
take risks

[next]

Subjective numeracy scale, as published in Fagerlin et al (2007).

For these questions, display a 6-point scale with anchors 1 = "not at all good" to 6 = "extremely good."

NumeracyQ1. How good are you at working with fractions?

[scale]

NumeracyQ2. How good are you at working with percentages?

[scale]

NumeracyQ3. How good are you at calculating a 15% tip?

[scale]

[next]

Experience level

CoursesQ1. Please indicate if you have taken college-level coursework in any of the following fields. (Mark all)

Microeconomics or game theory

Marketing or business

Law

None of the above

ExperienceQ1. Approximately how many in-person, laboratory experiments have you completed before today? If you're not sure, please make your best guess.

0

1 to 3

4 to 6

7 to 9

10 or more

[next]

GenderQ1. What is your gender?

Male

Female

[next]

Thank you for participating in today's experiment. Please wait at your desk until your participant number is called. You will then receive your payment from the experimenter.

Your number is: [participant number]