



Teacher guide for the information (prediction) market game

Lab implementation, theoretical background,
experimental evidence and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



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<https://beer-lab.org/>

How to use this guide

This guide lets you prepare, run and discuss in class the **information (prediction) market** game developed for the Behavioral and Experimental Economics Research Lab (BEER Lab) at the Department of Economics, Tecnológico de Monterrey. It reuses, unmodified, the continuous-trading engine of the asset market (`asset_market`); what changes is what is traded: a security that pays off according to a hidden binary outcome, while each person in the group holds a private, noisy hint about which one it will be. It is written for instructors of intermediate microeconomics, information economics and behavioral economics, with or without prior experience in experimental economics.

The **quick-start chapter** gets a session running. The operational chapters explain every screen. The conceptual chapters give the theoretical background and evidence needed to interpret results. Shared rules are explained once; the extended variant lists only what changes relative to the basic game.

Author

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For the instructor

This guide matches the English interface. A separate Spanish version exists. Screenshots in this guide were taken on a local instance of the game with simulated decisions; the numbers shown illustrate the interface and are *not* results from a real class. Project only aggregate results: never link participant codes to names, student IDs, seats or individual decisions.

This game is still being prepared for the lab server. The access steps in Chapter 2 and the screen sequence in Chapter 3 are already final (tested on an identical copy of the game); only the screenshots of YOUR game's card, login and rooms on `teaching-admin.beer-lab.org` and `teaching.beer-lab.org` are still missing — this guide will add them once the game goes live on those sites.

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Quick-start guide

1.1 At a glance

Purpose	Show, with the session's own data, whether the price of a continuous market ends up close to the value that would reflect <i>all</i> the information scattered across the group, even though no one person holds it in full — Hayek's argument about prices, tested in the classroom.
Participants	The whole class forms <i>one single market</i> . Any number works; with 8 or more people, information aggregation is easier to see (more distinct hints in play).
Hidden outcome	Each period, the system secretly flips to A or B (50/50). Nobody knows which until the end of the period.
Private hint	Each person gets their own hint (says A or says B) that is right 70% of the time, independent across people. Nobody sees anyone else's hint.
Security	Starts the period with 1000 ECU in cash and 3 units (reset every period). Pays 100 ECU per unit if the outcome is A, 0 if B.
Trading	Continuous market for 90 seconds per period (configurable): buy and sell offers, with immediate acceptance of the best standing offer.
Earnings	Cash earned or spent trading, plus final units $\times$ whatever the security paid.
Duration	About 10 minutes with 1 period (demonstration); about 30–35 minutes with 8 periods, not counting discussion; with chat, up to 10 more minutes.
Instructor (you)	teaching-admin.beer-lab.org → the game's card → Open panel . Asks for a username and password (section 2.1).
Students	The room link predictionmarket.beer-lab.org/room/prediction_market_e its QR code (section 2.5), or teaching.beer-lab.org .
Report	Average distance of the market price from the fully-informed value, against that same distance for the no-information price; average price trend by period; early versus late periods; last-period price histogram; round-by-period table.

Note

There are two different sites. **teaching-admin.beer-lab.org** is yours: from there you open the game's panel and download this guide. **teaching.beer-lab.org** is for your students: from there one can only *play*, not create sessions.

1.2 Minimal sequence

Before class

1. Request panel access at lab.economia@servicios.tec.mx, stating the game, course, number of students and date. You will receive the password for the **admin** user.
2. Open teaching-admin.beer-lab.org, find **Information (prediction) market** and click **Open panel**. Enter username and password.
3. Choose the mode: one period (demonstration), eight periods (reference mode) or the extended chat variant.
4. Rehearse in **Demo**: open the eight-period configuration and play it with several tabs to get familiar with the screens and the report (section 2.3).

In class

5. Count the students present.
6. In the panel, open **Rooms** and the **[EN] Prediction Market** room (or the extended one). Choose the configuration, type the *exact* number of students in **Number of participants** and click **Create**.
7. Share the room link or project its QR code. Each student clicks **Start**.
8. In the room, click **Monitor the session**: this opens the session page, with the **Monitor** (progress) and **Report** tabs. When the last period ends, open **Report**, click **Show results** and lead the discussion.

After class

9. In the room, click **Close this room**. It is then ready for the next group; the session's data stays available under **Sessions**.

1.3 Checklist

- ☐ Panel password received and tested at predictionmarket.beer-lab.org/login.
- ☐ Rehearsal done in **Demo**.
- ☐ Devices, internet, browser and projector ready.
- ☐ Mode chosen (one or eight periods, with or without chat) and enough class time.
- ☐ Session's number of participants matches the number of students present.
- ☐ Room link or QR code at hand (section 2.5); tested from a phone.
- ☐ Made clear that ECU are experimental units and there is no cash payment.
- ☐ Monitor and report open; fully-informed value computed before revealing results.

Platform access

2.1 Your access: teaching-admin and the game's panel

The instructor page is teaching-admin.beer-lab.org. It does not appear in the beer-lab.org menu: type the address directly or bookmark it. It lists every classroom game in the lab; you can search by title, topic or JEL code.

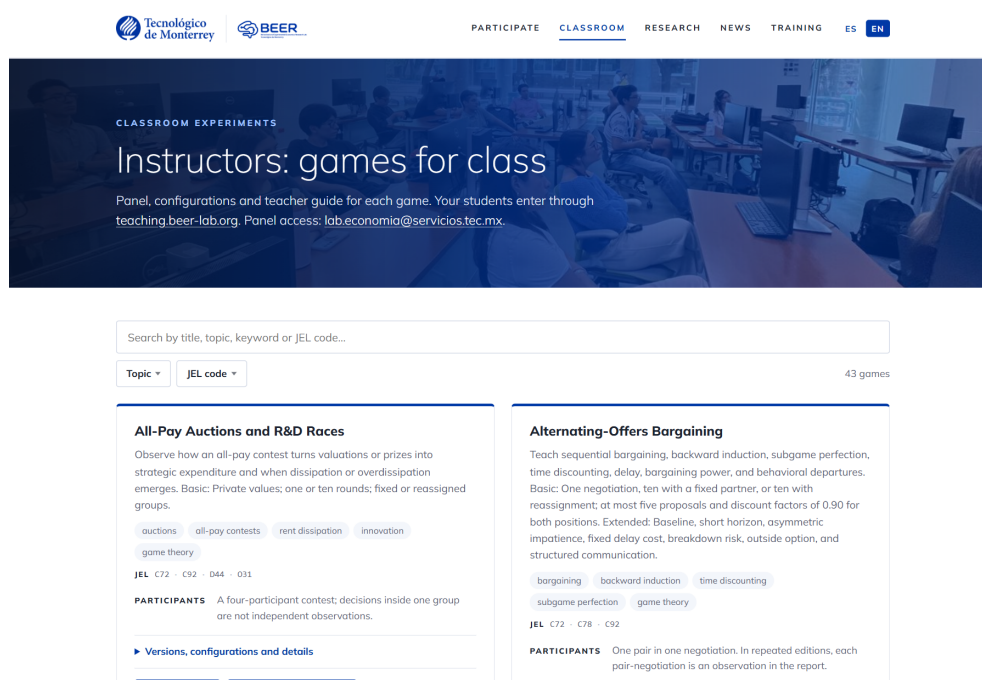


Figure 2.1: Instructor page: teaching-admin.beer-lab.org. Once this game goes live, its card will appear in this same directory (search for **Information market**).

Each game has a card with its description, number of participants and duration, and two buttons: **Open panel**, which goes to the game's panel, and **Teacher guide (PDF)**, which downloads this guide (the **EN** link downloads the English version). Expanding **Versions, configurations and details** lists the rooms, each with its own **open panel** straight to that room's session-creation form. The game's panel (<https://predictionmarket.beer-lab.org>) is protected: **Open panel** shows the **Admin Login** screen, where you type **admin** under **Username** and the password the lab gave you under **Password**. If you do not have it, request it at lab.economia@servicios.tec.mx.

Note

This game does not yet have its own card in the directory or an active panel at predictionmarket.beer-lab.org: it is still being prepared. The procedure above is identical to every other lab game's (see the Cournot, Bertrand, asset market and other market guides); once it goes live, this section will be updated with screenshots specific to **Information market**.

2.2 The panel: minimal vocabulary

The panel is oTree's own and is in English. These are the only terms you need:

Demo	Practice sessions. Creates a session with fictitious participants that you play yourself across several tabs. Use it to rehearse, never with students.
Rooms	Fixed addresses for class. This game has four: basic and extended, in Spanish and English. Students always enter through a room.
Create / Number of participants	Create the session in the room and declare how many people will play.
Monitor	A table with each participant's period and screen. It does not show decisions.
Advance slowest participants	The Monitor button that moves along whoever has fallen behind (section 2.4).
Report	The instructor report for projecting aggregate results.
Data	Downloads the data as CSV and the chat messages.
Sessions	A list of all your sessions, to return to an earlier one.
Close this room	Frees the room when done, for the next group.

In this panel, **Demo** shows only this game's 6 configurations and **Rooms** only its four rooms. If a different game appears, do not start the session and notify the lab.

oTree
Demo
Sessions
Rooms
Data
Server Check

Demo

[ES] Mercado de información — un periodo
[ES] Mercado de información — 8 periodos
[EN] Prediction market — one period
[EN] Prediction market — 8 periods
[ES] Mercado de información extendido — con chat, 8 periodos
[EN] Prediction market extended — with chat, 8 periods

Juegos de mercados / Market games — BEER Lab

Mercado de información (predicción) / Information (prediction) market

To add to this list, create a new session config.

Figure 2.2: Demo: the game's 6 configurations (4 basic, 2 extended, in Spanish and English).

oTree Demo Sessions Rooms Data Server Check	
Rooms	
Current rooms:	
[ES] Mercado de información	
[EN] Prediction Market	
[ES] Mercado de información — extendido	
[EN] Prediction Market — extended	

Figure 2.3: Rooms: the game's four rooms.

2.3 Rehearsing before class

In **Demo**, click a configuration: a practice session with eight participants is created and the links page appears. Open each **P1**, **P2**, ..., **P8** link in a separate tab and play as if you were each student; then open **Report**. Just as in class, the session is one single market: trading screens last 90 seconds and the wait afterward waits for all eight people, so it helps to open every tab and move each one along. These sessions do not affect your classes.

oTree Demo Sessions Rooms Data Server Check

[EN] Prediction market — 8 periods: session 'pmlxzech' (demo)

[New](#)
[Links](#)
[Monitor](#)
[Data](#)
[Payments](#)
[Report](#)
[Description](#)

Below are temporary links for testing and demonstration. To launch a real study, either create persistent links by setting up a [room](#), or create a session through the [sessions page](#).

Choose one of the following options to play the session:

Combined views

☐ Split-screen view
Not available ⓘ

☒ Grid view
[Launch](#)

Session-wide testing link

Open the below link in up to **8** browser tabs.

<http://localhost:8031/join/lumoderi>

Single-use links

Open each link in its own browser tab.

P1	http://localhost:8031/InitializeParticipant/q4rmme8f
P2	http://localhost:8031/InitializeParticipant/r3s97j7r
P3	http://localhost:8031/InitializeParticipant/tkr3pa67
P4	http://localhost:8031/InitializeParticipant/w1m57jd7
P5	http://localhost:8031/InitializeParticipant/hexjermb
P6	http://localhost:8031/InitializeParticipant/kstubp7e
P7	http://localhost:8031/InitializeParticipant/mhxjdky0
P8	http://localhost:8031/InitializeParticipant/5g5lkgtf

Figure 2.4: Links for a practice session with eight participants. This guide's screenshots were taken on a local copy, which is why the addresses say `localhost`; on the server they say `predictionmarket.beer-lab.org`.

Note

Do not rehearse with the room link open in several tabs of the same browser: oTree recognizes the browser, and every tab would count as the same person. Use **Demo** to rehearse instead.

2.4 Creating the session in class

Under **Rooms**, open the room for the language you will use. The form offers only that room's configurations: the basic English room offers `prediction_market_en_1_period` and `prediction_market_en_8_periods`; the extended one, `prediction_market_extended_communication`. Choose the configuration, type the number of students present under **Number of participants** and click **Create**.

The screenshot shows the oTree web interface. At the top is a navigation bar with links: oTree, Demo, Sessions, Rooms, Data, and Server Check. Below this, the page title is "Room: [EN] Prediction Market" with the subtitle "Create a new session". A light blue box contains the text: "English room. Only the configurations of this game, language and edition are shown below." Under "Session Config", there is a dropdown menu currently showing "[EN] Prediction market — one period". Below that is a text input field for "Number of participants", which is currently empty. A small note below the input field says "Must be a multiple of 1". At the bottom of the form is a blue "Create" button. Below the form, there is a link "Configure session" followed by a gear icon, and the text "App sequence".

Figure 2.5: Form for the basic English room: only its two configurations appear.

For the instructor

If class time is short, **Configure session** lets you change three parameters before creating the session: **active_rounds** (number of periods, 1 to 8), **trade_seconds** (trading seconds per period) and, in the extended room, **chat_seconds** (chat seconds before each period). The instructions and the report adjust automatically to the chosen number of periods. Do not change the other fields (language, edition, treatment, chat).

Note

Declare the exact number, with no spare seats. The whole class forms one single market, and each period ends after 90 seconds (or when you advance whoever is left): if you declare more participants than join, the entire session is left waiting for people who never arrive. If one more student than declared arrives, they will see “The session is full”; in that case, before starting, click **Close this room**, create another session with the correct number, and ask everyone to reopen the link or the QR code.

Each period's trading time is fixed and there is no button to end it early: the trading screen has no form to submit, so even if nobody trades anything, the period still ends on its own

once the time runs out. The screen that follows (waiting while the outcome is revealed) can wait indefinitely if someone disconnected before their own period finished. Ask them to reopen the room in the same browser: it resumes where it left off. If they cannot, use **Advance slowest participants** in the Monitor. Do not click that button while trading is proceeding normally: it would close the period early for whoever is still trading.

oTree Demo Sessions Rooms Data Server Check

[EN] Prediction market — 8 periods: session 'pmlxzech' (demo)

New Links Monitor Data Payments Report Description

ID	Code	Label	Progress	App	Round	PageName	Waiting	WaitsFor	Since
P1	q4mme8f		6/72	prediction_market	1	Trade			1m
P2	r3s97j7r		6/72	prediction_market	1	Trade			1m
P3	tkr3pa67		6/72	prediction_market	1	Trade			1m
P4	w1m57jd7		6/72	prediction_market	1	Trade			1m
P5	hexjermb		6/72	prediction_market	1	Trade			1m
P6	kstubb7e		6/72	prediction_market	1	Trade			1m
P7	mhxjdky0		6/72	prediction_market	1	Trade			1m
P8	5g5lqgtf		6/72	prediction_market	1	Trade			1m

8 started, 8 in progress (total: 8)

Figure 2.6: Monitor: each participant's period and page, without showing decisions.

2.5 How your students join

Students need no account and nothing to install; a phone or computer browser is enough. They have three paths, all leading to the same room:

1. **QR code.** Project the one for the room you are using (below, and full-size in appendix A). They scan it with a phone camera.
2. **Room link.** Share it over the class chat or on Canvas: https://predictionmarket.beer-lab.org/room/prediction_market_en.
3. **Catalogue.** At teaching.beer-lab.org they search for **Information (prediction) market** and click their language's button.



English, basic

[predictionmarket.beer-lab.org
/room/prediction_market_en](https://predictionmarket.beer-lab.org/room/prediction_market_en)



English, extended

[predictionmarket.beer-lab.org
/room/prediction_market_extended](https://predictionmarket.beer-lab.org/room/prediction_market_extended)



Español, básica

[predictionmarket.beer-lab.org
/room/prediction_market_es](https://predictionmarket.beer-lab.org/room/prediction_market_es)



Español, extendida

[predictionmarket.beer-lab.org
/room/prediction_market_extendido](https://predictionmarket.beer-lab.org/room/prediction_market_extendido)

What the participant sees

The student opens the room and clicks **Start**. If you have not created the session yet, they see “Please wait” and join as soon as you do; so you can share the link or QR code from the start of class. No email or password is needed: they receive an anonymous code.

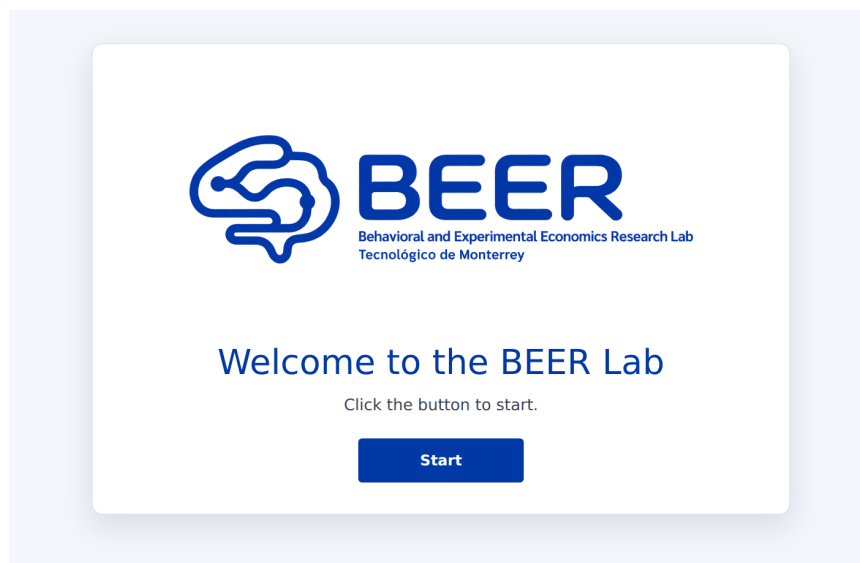


Figure 2.7: Room the student opens.

Language is set per room: a session created in the English room only admits students entering through the English room. If your group is mixed, pick one language for everyone: the whole class forms one single market.

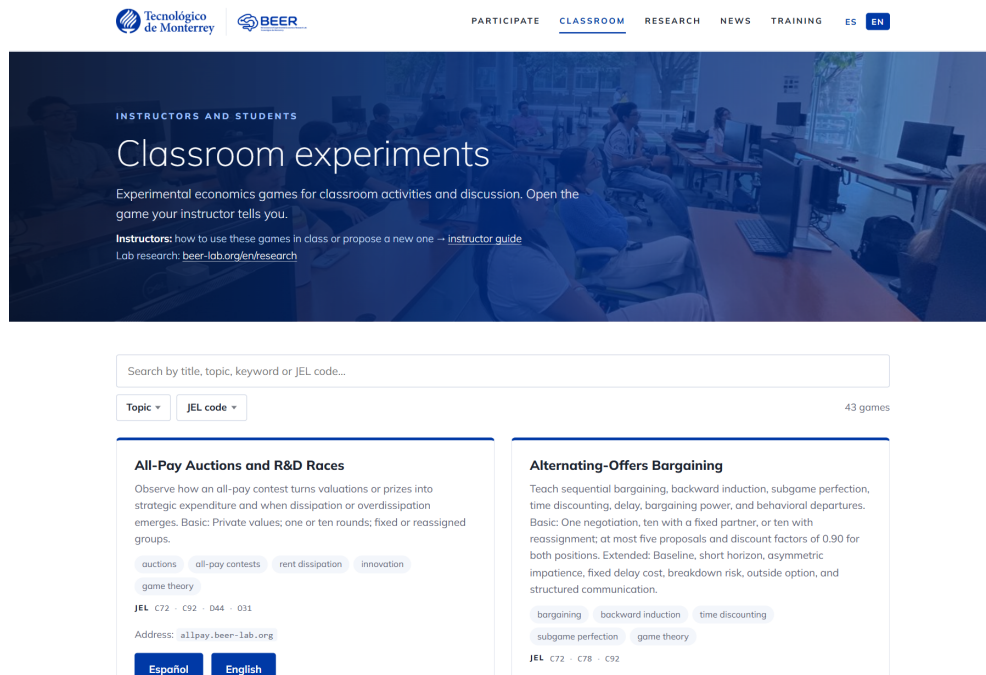


Figure 2.8: Catalogue at teaching.beer-lab.org, the students' page. Once this game goes live, its card will appear here (search for **Information market**).

The basic game and its screens

3.1 Rules, incentives and benchmarks

There is one security and one market for the whole class. Each period is a new, independent market: the system secretly flips to outcome A or B (50/50) and, for each person, draws a private hint that matches the true outcome 70% of the time (and contradicts it otherwise), independently across people. Nobody sees anyone else's hint — the only way one person's information can influence anyone else's decisions is through the **price** being traded.

Each person starts the period with 1000 ECU in cash and 3 units of the security (nothing carries over from one period to the next). The security pays 100 ECU per unit if the final outcome is A, 0 ECU if B; it is revealed and settled at the end of the period. During the 90 seconds of trading, anyone can buy or sell: there are no fixed roles. The only limits are budget and inventory: nobody can offer to buy above their own cash or sell without units. There is no short selling. Period earnings are the cash earned or spent trading, plus final units $\times$ whatever the security paid.

For the instructor

Before playing, ask: if you only knew your own hint (right 70% of the time), how much would you pay for a unit? Then ask: if *someone* could see all eight hints in the group, how confident would that person be? That is exactly the comparison the instructor report makes at the end: the traded price against the value that would reflect all of that information put together.

3.2 Cover, instructions and comprehension

The cover presents the BEER Lab and the rules of conduct. The instructions describe only the action: they never mention “prediction market”, “information aggregation” or “Bayesian posterior” — those terms appear only in the instructor report.



Welcome to the BEER Lab

The **Behavioral and Experimental Economics Research Lab** of the Department of Economics at Tecnológico de Monterrey is a space for learning about economic decisions through controlled activities.

Today you will take part in a market trading a security whose payoff depends on an outcome that is not yet known. Your earnings depend on your decisions.

During the session

- Do not talk or communicate with other people, except through the means shown on screen.
- Make your decisions individually.
- Follow the on-screen instructions. Do not refresh or close this page.
- If you need help, raise your hand.

I have read and understood the lab rules.

☐ Yes ☐ No

Start

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Figure 3.1: Cover and lab rules.

Instructions

Period 1 of 8

Each period, the system secretly flips to one of two outcomes: A or B, each equally likely. Nobody knows which one until the end of the period.

You receive a **private hint** about the outcome: it says A or it says B, and it is right 70% of the time (no one else knows your hint, and you do not know anyone else's).

During the period a security is traded: if the final outcome is A, each unit pays 100 ECU; if it is B, it pays 0 ECU. The outcome is revealed and paid at the end of the period.

How the market works

- You start with 1000 ECU in cash and 3 units of the security. You can trade at any point during the period: post a buy or sell price, or accept the other side's best offer.
- At any time you can accept the best offer from the other side: if you have cash, you can accept the best ask; if you have units, you can accept the best bid. Accepting closes the trade immediately at that price.
- The system will not let you offer or accept a price above your available cash, or sell more units than you have. You can trade multiple times in the same period.
- Your earnings for the period = the cash you earned or spent trading, plus your final units $\times$ whatever the security pays (100 ECU if the outcome is A, 0 if B).

Example

Example: if 5 of 8 people had a hint that says A, the price that exactly reflects all of that information together would be 84 ECU per unit (very different from the 50 ECU the security would be worth with no information at all). You never see anyone else's hint — only your own, and the prices being traded.

Example: if you buy a unit at 60 ECU and the final outcome is A (paying 100), your earnings on that unit are $100 - 60 = 40$ ECU.

- There will be 8 periods. Each one draws a new outcome and a new hint. Your earnings from all periods are added up.
- Amounts are in ECU (experimental currency units). There is no cash payment.

Continue

Powered by 

Figure 3.2: Instructions: hidden outcome, private hint, the security, trading rules and the Bayesian example.

The example uses a split deliberately different from the real size of any configuration (5 of 8 people with a hint saying A, fully-informed value 84 ECU versus 50 ECU with no information at all) so it cannot work as a price anchor, plus a second example about earnings (buy at 60, outcome A, earnings 40 ECU). The comprehension check asks for those same two results; a wrong answer explains the rule and allows another try. The number of attempts is recorded in the data.




Before you start

Period 1 of 8

Answer both questions based on the instructions.

If 5 of 8 people had a hint that says A, which of these prices best reflects all of that information together?

☐ 0 ECU
☐ 50 ECU
☐ 84 ECU
☐ 100 ECU

If you buy a unit at 60 ECU and the final outcome is A, what are your earnings on that unit?

☐ -40 ECU
☐ 40 ECU
☐ 60 ECU
☐ 100 ECU

Check

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Figure 3.3: Comprehension check.




Por favor corrija los errores.

Before you start

Period 1 of 8

Answer both questions based on the instructions.

If 5 of 8 people had a hint that says A, which of these prices best reflects all of that information together?

☐ 0 ECU
☐ 50 ECU
☐ 84 ECU
☐ 100 ECU

Check the example in the instructions: the more hints point to the same outcome, the closer the price that reflects all the information gets to what that outcome pays.

If you buy a unit at 60 ECU and the final outcome is A, what are your earnings on that unit?

☐ -40 ECU
☐ 40 ECU
☐ 60 ECU
☐ 100 ECU

Check: your earnings per unit = what the security pays if that is the outcome, minus what you paid for it. They can be negative.

Check

Powered by [oTree](#)

Figure 3.4: Incorrect answers: the message recalls the rule without giving the answer away.

3.3 Trading, waiting and the result

Without chat, the comprehension check leads straight into period 1's trading. The trading screen shows the time left, your own cash and units, **your own private hint** (always visible, never anyone else's), the best standing bid and ask, and the list of trades closed in the period. The participant can:

- **Offer to buy** at a price: only accepted if it improves on (exceeds) the current best bid and

does not exceed their cash.

- **Offer to sell** at a price: only accepted if it improves on (is lower than) the current best ask and they hold at least one unit.
- **Buy at the best ask** or **Sell at the best bid**: the trade closes immediately, for one unit, at the accepted offer's price.

Every trade clears both standing offers; the market restarts with no offers. Nobody can accept their own offer.




Time left to complete this page: **1:10**

Trading

Period 1 of 8

Your cash
1045

Your units
2

Your private hint
A

Best bid
45

Best ask
65

Your bid

Offer to buy

Your ask

Offer to sell

Buy at the best ask
Sell at the best bid

Trades closed this period

#	Price
1	45
2	50

Powered by [oTree](#)

Figure 3.5: Trading in period 1: the private hint, the standing offers and the trades closed so far (simulated decisions).



Time left to complete this page: **1:09**

Trading

Period 1 of 8

Your cash
1045

Your units
2

Your private hint
A

Best bid
45

Best ask
65

Your bid

40

Offer to buy

Your ask

Offer to sell

Buy at the best ask

Sell at the best bid

Trades closed this period

#	Price
1	45
2	50

Powered by [qTree](#)

Figure 3.6: A bid that does not improve on the standing one is rejected with a notice.

15



Time left to complete this page: **1:23**

Trading

Period 2 of 8

Your cash
1000

Your units
3

Your private hint
B

Best bid
—

Best ask
—

Your bid

Offer to buy

Your ask

Offer to sell

Buy at the best ask

Sell at the best bid

Trades closed this period

#	Price
---	-------

Powered by [oTree](#)

Figure 3.7: Trading in period 2: cash, units and hint all reset — it is a brand-new market (simulated decisions).

Once the time runs out, the screen waits for the whole group to finish trading; at that point the outcome is revealed and the security is settled.

Period result

Period 1 of 8

Your private hint

A

Revealed outcome

B

Your final cash

1045

Your final units

2

Your earnings

45 ECU

Cumulative earnings

45 ECU

Next period

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Figure 3.8: Period 1 result: the own hint and the revealed outcome, side by side (simulated decisions).

What the participant sees

“Please wait” means other people in the market have not finished yet. It is not an error. The participant should not close or refresh the page.

The result shows the own hint, the revealed outcome, final cash and units, period earnings and (if there is more than one period) cumulative earnings. At the close, the history recalls the hint, outcome and earnings of every period played.

End of the activity

Period 8 of 8

Your total earnings

365 ECU

Period	Your hint	Outcome	Earnings
1	A	B	45
2	B	B	0
3	A	B	48
4	B	B	-70
5	B	B	0
6	B	B	90
7	B	B	-48
8	B	A	300

Thank you for participating. Please wait for your instructor.

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Figure 3.9: Closing screen: total earnings and the 8-period history (simulated decisions).

Instructor report and debrief

4.1 When to reveal

Report is a tab on the session page: reach it from the room via **Monitor the session**, or from **Sessions** once the session has ended. It opens with results hidden. The top shows participants, completed periods, whether the current period is unfinished, and total trades, so you can project it from the start without giving anything away. Click **Show results** once the last period ends; **Refresh** brings in new periods and **Hide results** covers them again.

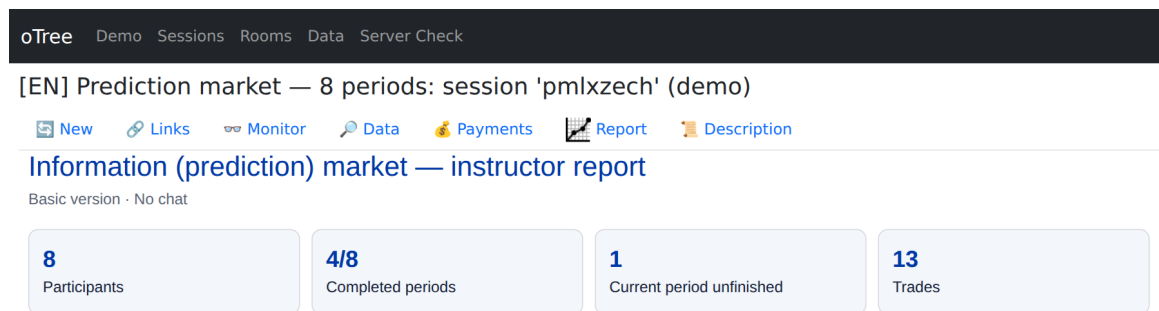


Figure 4.1: Report with results hidden and a progress counter.

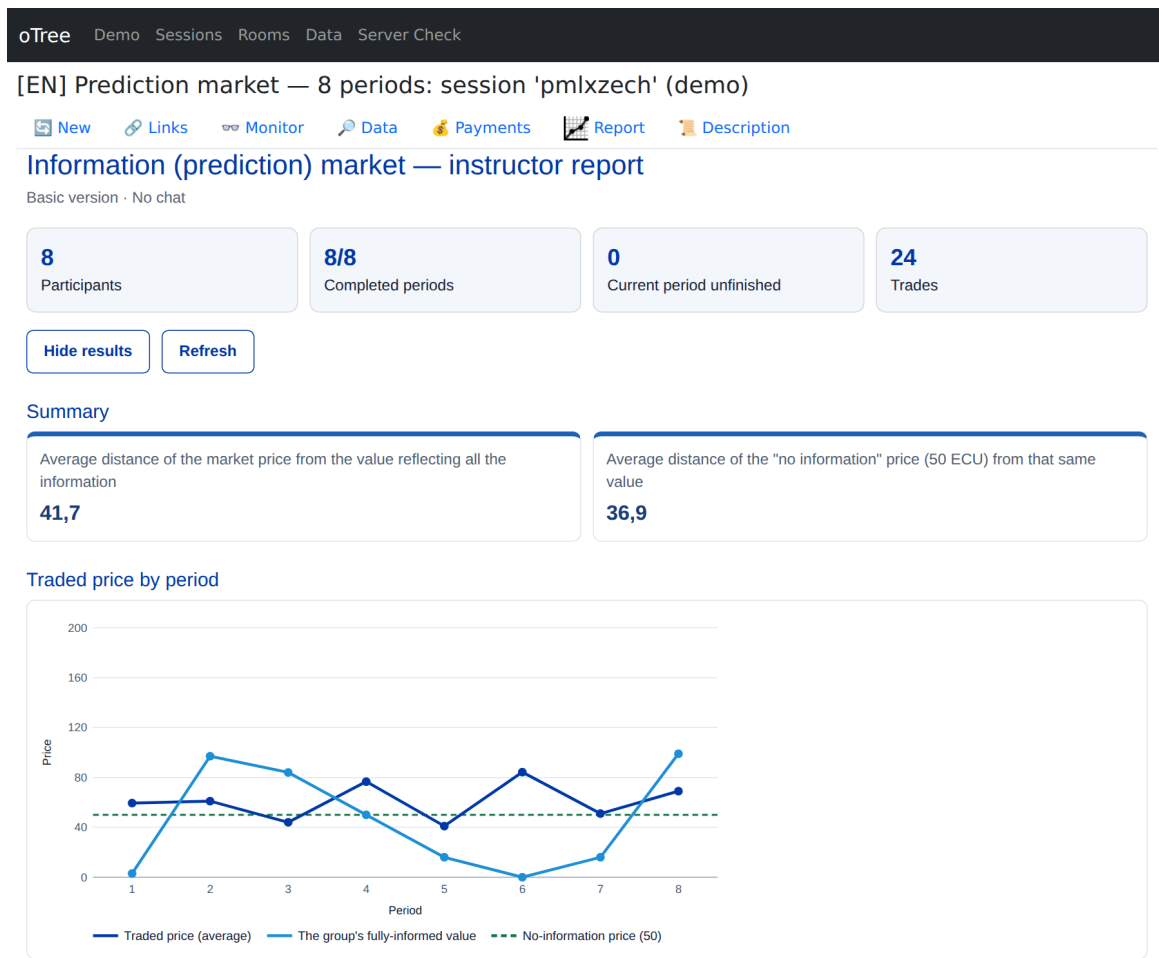


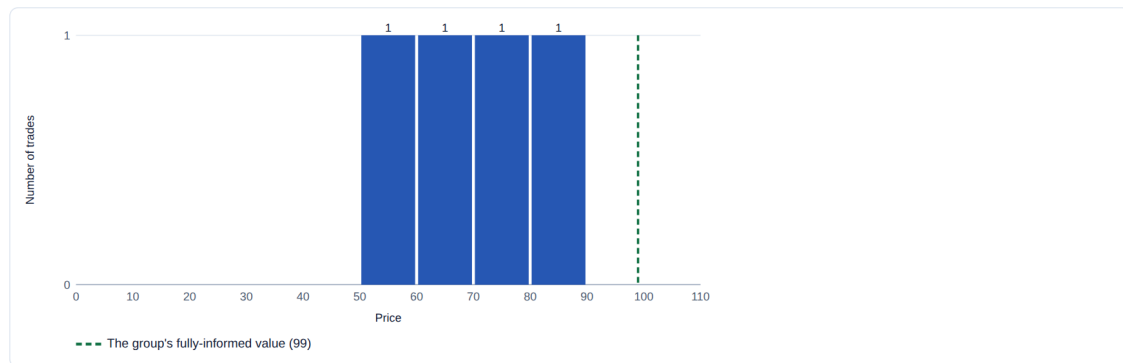
Figure 4.2: Revealed report: summary and traded price against the fully-informed value, by period (simulated decisions).

Early periods versus late periods (market price distance)

	Gap
Periods 1–3	44,1
Periods 6–8	49,8

Distribution of traded prices

Trades in the last completed period.



Results by period

Period	Trades	Average price	Fully-informed value	Gap
1	5	59,4	3	56,4
2	3	61	97	36
3	2	44	84	40
4	3	76,7	50	26,7
5	2	41	16	25
6	3	84,3	0	84,3
7	2	51	16	35
8	4	69	99	30

Individual data: Data → Custom export (prediction_market). Chat messages: Data → Chat.

Figure 4.3: Revealed report: early versus late periods, last-period price histogram and the round-by-period table (simulated decisions).

4.2 How to read the report

1. Start with the summary: the average distance of the market price from the fully-informed value, against that same distance for the no-information price (50 ECU). If the first is clearly smaller than the second, the market is aggregating dispersed information better than total ignorance would — the game's central question.
2. In the chart, the dark blue line is the average traded price each period; the light blue line is that period's fully-informed value (which changes period to period because each one draws a different split of hints); the dashed line is the no-information price (50 ECU, fixed). A period with no trades has no price.
3. The early-versus-late table (from 6 completed periods) compares the distance of periods 1–3 against the last three: does the market's aim improve with practice?
4. The histogram shows every trade's price in the last completed period, with a line at that period's fully-informed value: it shows whether the market converged together or stayed widely

spread out.

5. The round-by-period table implicitly reflects how many people in the group held a hint saying A (through the fully-informed value column) and how many trades took place. A period with few trades has less chance for the price to aggregate anything.

Debrief script

Before revealing, ask: if everyone only trusted their own hint (70% accuracy), how close to the true value would they expect the price to land? Then reveal the summary and the chart. Ask someone who bought near the end of a period to explain what they were watching to decide that price: their own hint, or the price already being traded? Close by working out, on the board, the fully-informed value for two or three different hint splits (the table in section 5.1).

Theoretical background and evidence

5.1 The Bayesian benchmark

Theoretical background

If k of n people in the group held a hint saying A, and each hint is right with probability p independently, the probability that the outcome is A given all of that information together is

$$P(A \mid k \text{ of } n \text{ say A}) = \frac{1}{1 + \left(\frac{1-p}{p}\right)^{2k-n}},$$

and the price that would exactly reflect that probability is $100 \times P(A \mid \dots)$ ECU per unit — the **fully-informed value**. That is the figure the instructor report compares against each period's average traded price, and also against what the security would be worth with no information at all ($100/2 = 50$ ECU, the prior probability). If the market aggregates dispersed information well, the traded price should land much closer to the first number than the second, even though each person individually only holds a hint that is right barely 70% of the time.

With $p = 0.7$ and $n = 8$, the fully-informed value moves very fast with each additional hint pointing to the same outcome:

k (of 8 say A)	0	1	2	3	4	5	6	7	8
Fully-informed value (ECU)	0	1	3	16	50	84	97	99	100

With a perfectly even split ($k = 4$ of 8) there is no net information and the value matches total ignorance, 50 ECU. With just one more person on either side ($k = 5$ or $k = 3$), the value already moves sharply away from 50 — the instructions example (chapter 3) uses exactly $k = 5$. With $k = 7$ or 8, the value sits nearly at the extreme, even though each individual hint was only right 70% of the time: that is the game's central idea — *combining* imperfect, independent hints produces a far better estimate than any single hint on its own.

5.2 Experimental evidence

Hayek (1945) lays out the argument this game tests in the classroom: the knowledge relevant to an economic decision is scattered across many people, none of whom holds it in full, and prices are the mechanism that can aggregate it without anyone needing to explicitly communicate what they

know. [Plott and Sunder \(1988\)](#) design the classic laboratory experiment that tests this idea directly: continuous markets where each person receives private information about which of several states of nature occurred, and show that, under reasonable conditions, the closing price converges to the rational-expectations equilibrium price — as if everyone could see all the information together — even though no single trader does. It is this game’s reference design.

[Forsythe and Lundholm \(1990\)](#) extend that result and systematically study when aggregation *fails*: with few practice periods, with information very unevenly split across people, or with a very small number of informed people, the price may not approach the fully-informed value, or may only do so after several repetitions of the market. Taken together, the two studies’ conclusion is that price aggregation of information is not automatic: it depends on the group’s experience and on the structure of the information — exactly what this guide encourages discussing with the session’s own data.

5.3 Patterns worth discussing

- The market price’s distance from the fully-informed value tends to be smaller than the no-information price’s distance, even in a first session with an inexperienced group — but it rarely reaches zero.
- A period with very few trades aggregates less information: if almost nobody trades, the closing price may reflect only the hints of whoever did participate.
- When the hint split is close to even (k near $n/2$), the fully-informed value sits close to 50 ECU, making it harder to tell whether the market “got it right” through aggregation or by chance.
- In the chat variant, watch for anyone who accidentally reveals their own hint: that changes completely what the rest of the group can infer, and is an explicit violation of the rule they were asked to follow.

Note

A class’s results are descriptive. A single session is one market per period: periods within the same session are not fully independent observations (same people, same group dynamics), and there is no way to separate the group’s effect from the design’s effect. Whether or not your class shows clear aggregation neither confirms nor refutes the literature; without several comparable sessions, no treatment effect can be estimated.

Basic modes

The two basic modes use the rules from chapter 3 and have no chat.

6.1 One period (demonstration)

`prediction_market_en_1_period` has a single period. It lasts about 10 minutes. Useful for teaching the mechanics, for rehearsal, or for a short class, but the report does not include the trend chart or the early-versus-late table (both require more than one completed period).

6.2 Eight periods

`prediction_market_en_8_periods` is the reference mode: eight independent markets, each with a new outcome and a new split of hints. It is the mode for observing whether the price's distance from the fully-informed value holds steady, improves, or worsens with repetition. Reserve 30–35 minutes for the game and plan the discussion for the same session or the next, with the report saved.

For the instructor

If you can spend two sessions, repeat the market with the same group the following class. Comparing the first and second sessions illustrates the effect of experience on information aggregation, one of the central findings of [Forsythe and Lundholm \(1990\)](#). Remember that a comparison between two sessions is illustrative, not causal.

Extended variants

7.1 Treatment map

Variant	What changes	Pedagogical question
Communication	60s group chat before each period; 8 periods	Does talking help aggregate information faster (sharing impressions without revealing the hint), or distort it (someone reveals their hint and contaminates the price)?

7.2 Communication

`prediction_market_extended_communication` is identical to the eight-period mode, but before each period the whole market can write in an anonymous chat for 60 seconds. Every message appears under the same name (“Participant”), so nobody can be identified. The screen explicitly reminds participants not to reveal their own hint or personal information. The **Go to the market** button lets someone leave the chat early; trading begins once the whole group has left or time runs out. The variant adds up to 10 minutes to the session.



Time left to complete this page: **0:56**

Messages

Period 1 of 8

You can write to the whole group. You have 60 seconds. Do not write your name, your hint, or any personal information.

Participant

Participant

Participant

Does anyone have a clear hint?

I'm not going to say what mine says.

The price already moved a fair bit, right?

Send

Go to the market

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Figure 7.1: Chat before the period (demonstration messages).

Unlike oligopoly games, where chat facilitates collusion, here there is no single theoretical prediction: communication can help aggregate impressions without directly revealing any hint, or it can ruin the experiment if someone writes theirs down. It is an empirical question to discuss with the session's own data and, in particular, the messages under **Data** → **Chat**.

Debrief script

Compare the average price distance with a no-chat session, if you have one. Read a few messages aloud, without identifying anyone: did anyone accidentally reveal their hint? Did anyone try to convince others without saying why? Connect this to the role of rumors and investment forums in real financial markets.

Lesson plan and reading the results

8.1 Suggested 50-minute session

0–5 min	Room access and lab rules. Students join by QR code or link.
5–12 min	Instructions, the Bayesian example and the comprehension check.
12–32 min	Eight periods of trading (90s each, plus the reveal wait). Meanwhile, prepare the Monitor.
32–36 min	Ask the class for predictions: if everyone only trusted their own hint, how close to the true value do they think the price got?
36–46 min	Summary, chart, histogram and round-by-period table.
46–50 min	Close by working out the Bayesian formula on the board and Hayek’s argument about prices as aggregators of dispersed knowledge.

8.2 Questions to drive discussion

- If you only had your own hint, how confident would you be about the outcome? What if you could see all eight hints in the group?
- In which period did the price land closest to the fully-informed value? What happened in that period’s trading?
- How can the price carry information from one person to another if nobody says their hint out loud?
- What would happen to aggregation if only two or three people traded actively and everyone else did nothing?
- If they played again with the same group, do they think the price would approach the fully-informed value faster?
- What real markets resemble this one: election prediction markets, sports betting markets, a stock’s price ahead of an earnings announcement?

8.3 Common misreadings

Misreading	Clarification
“The final price is simply the average of all the hints.”	No: it is a non-linear Bayesian calculation (the formula in section 5.1), which moves toward the extremes much faster than a simple average once most hints agree.
“If the price got close to the correct value, each person must have traded very well.”	Not necessarily: aggregation can happen even if no single person is confident, as long as buying and selling decisions together reflect the dispersed hints.
“Since each hint is only right 70% of the time, the market can’t be much better than a coin flip.”	It is exactly the opposite: combining several independent hints, even imperfect ones, can push the probability to 99% or higher (table in section 5.1).
“A difference between two classes is causal.”	It requires comparable assignment and several independent sessions; one session is a single group playing several related periods.

Operations, privacy and troubleshooting

9.1 Privacy and conduct

- Never request or display names, student IDs or demographic information during this activity.
- Project only the aggregate report. Keep codes, screens, hints and individual earnings private.
- Ask students not to write their hint or personal information in the chat; the screen itself reminds them.
- Never use the session to grade anyone on their earnings.
- Treat the session as a teaching activity, unless there is a research protocol with specific consent.

9.2 Common issues

Situation	What to do
I opened <code>teaching.beer-lab.org</code> and cannot see how to create a session	That is the students' page. Use <code>teaching-admin.beer-lab.org</code> → Open panel .
The panel asks for a username and password	Username admin and the lab's password. If you do not have it, email <code>lab.economia@servicios.tec.mx</code> .
"Please wait" before starting	You have not created the session in that room yet, or the student opened a different room (another language or edition). It admits them as soon as you create it.
"Please wait" between trading and the result	Someone did not finish trading because they disconnected before their own 90 seconds ran out. Ask them to reopen the room in the same browser; if they cannot, use Advance slowest participants .
"The session is full"	More students joined than declared. Before starting: Close this room , new session with the correct number, everyone reopens the link.
Several tabs of the same browser are the same participant	Normal with the room link. Use Demo to rehearse instead.
"Your bid must be higher than the current one..."	The offer does not improve on the standing one or exceeds available cash. A rule, not an error.
"You have no units to sell"	The participant sold all their units; they can buy again while they have cash.
Not Found on a <code>/p/...</code> link	That individual link belongs to a previous session. Share the room again (link or QR code), not the individual link.
I want to see a session from another day	Panel → Sessions → the session → Report or Data .
Report with no data	The first period has not finished yet. Wait and click Refresh .
A period with no price on the chart	There were no trades in that period. A possible outcome, not an error.

9.3 Data for later analysis

Data → **Custom export (prediction_market)** gives one row per participant and period: session, anonymous code, period, language, edition, treatment, chat, private hint, final cash and units, revealed outcome, period earnings, and comprehension attempts. This export does not include each trade's price; average price and the number of trades per period are in the report's table. Chat messages are under **Data** → **Chat**. Treat periods within the same session as related: the same group of people played all of them.

Annotated bibliography

- [Hayek \(1945\)](#): the original argument about prices as a mechanism for aggregating knowledge dispersed across society, which this game tests directly in the classroom.
- [Plott and Sunder \(1988\)](#): the classic laboratory experiment testing whether continuous markets aggregate dispersed private information into the closing price; this game's reference design.
- [Forsythe and Lundholm \(1990\)](#): extends the previous result and systematically studies the conditions under which information aggregation fails or needs several repetitions.

Bibliography

- Forsythe, R., & Lundholm, R. (1990). Information aggregation in an experimental market. *Econometrica*, 58(2), 309–347. doi:10.2307/2938207.
- Hayek, F. A. (1945). The use of knowledge in society. *The American Economic Review*, 35(4), 519–530. <https://www.jstor.org/stable/1809376>.
- Plott, C. R., & Sunder, S. (1988). Rational expectations and the aggregation of diverse information in laboratory security markets. *Econometrica*, 56(5), 1085–1118. doi:10.2307/1911362.

QR code for each room

Project or print the page for the room you will use. Students scan it with their phone camera and press **Start**.

Information market

English room



predictionmarket.beer-lab.org/room/prediction_market_en

Scan the code and press **Start**.

Information market

English room, extended version



`predictionmarket.beer-lab.org/room/prediction_market_extended`

Scan the code and press **Start**.

Information market

Sala en español



predictionmarket.beer-lab.org/room/prediction_market_es

Escanee el código y pulse **Comenzar**.

Information market

Sala en español, versión extendida



predictionmarket.beer-lab.org/room/prediction_market_extendido

Escanee el código y pulse **Comenzar**.