



Instructor guide: strategic entry and limit pricing

Laboratory implementation, theoretical foundations,
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 supports preparation, implementation, and classroom discussion of the BEER Lab strategic-entry and limit-pricing family. It is written for instructors with different levels of experience in industrial organization, game theory, and experimental economics.

It explains platform access, both participant roles, the instructor report, theoretical predictions, and the evidence needed for a careful debrief. The quick route contains the minimum steps needed to open a session. Operational chapters show each screen and explain how to verify that links belong to the current session.

Conceptual chapters develop backward induction, asymmetric information, signaling, commitment, and reputation. Eight treatments are presented as changes to a common architecture. The final chapters provide feedback scripts, exercises with solutions, lesson plans, data guidance, and troubleshooting.

Author

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For the instructor

This activity is a pedagogical model calibrated in ECU. Price is an observable action that may contain information about costs. The exercise does not reproduce the full accounting of an industry and does not imply that every low price is anticompetitive. Preserve this distinction from the instructions through the final discussion.

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Overview and learning objectives

1.1 The economic question

An incumbent often makes decisions before a potential rival enters. It may set a price, install capacity, sign contracts, or build a reputation. The entrant observes some actions but may not know costs, demand, or the incumbent's willingness to compete. Entry therefore depends on payoffs and inference. A low price may reflect efficiency, a strategic sacrifice intended to deter, or a promotion unrelated to entry. The game asks students to distinguish these explanations.

Two participants interact sequentially. The incumbent privately learns whether it is strong with low cost or weak with high cost. It posts 40 or 80 ECU. The potential entrant observes price and treatment-specific information, then enters or stays out for 30 ECU. The type is revealed and earnings are computed at the end. Complete information can be solved by backward induction. With a hidden type, price can signal information and the response depends on beliefs.

This family differs from the production-entry-exit game, which studies operating and output choices among several firms. The present game focuses on a one-to-one strategic relationship, timing, and private information. It also differs from Stackelberg because the follower's action is entry and the incumbent may possess an unobserved type.

1.2 Learning objectives

Students should be able to draw the game tree, distinguish a strategy from an observed action, solve the complete-information benchmark by backward induction, explain when a prior price has no informational value, state posterior beliefs, describe separating and pooling incentives, distinguish costly signaling from commitment and reputation, assess policy using more than entry counts, and read repeated results without treating every round as independent.

A cross-cutting goal is evidence discipline. Little entry does not prove strategic deterrence; high cost or low profitability can produce the same fact. Different prices by type are consistent with signaling but can also follow mechanically from costs. A defensible interpretation follows the sequence from assigned type to price, information, entry, counterfactual payoff, and repeated pattern.

1.3 Family fact sheet

Purpose	Strategic entry, limit pricing, asymmetric information, commitment, reputation, and competition policy.
Experimental unit	One incumbent and one potential entrant.
Basic edition	One round, ten periods with a fixed pair, and ten periods with reassigned counterparts under complete information.
Extended edition	Complete information, hidden type, cheap mimicry, high entry cost, subsidy, capacity, reputation, and antitrust rule.
Decision	The incumbent posts 40 or 80 ECU; the potential entrant then chooses entry or staying out.
Outcome	Role-specific earnings by type, price, and entry; best responses, entry rates, and round-by-round evolution.
Participants	An even number; two or four are suitable for demonstrations.
Suggested duration	20–30 minutes for one mode; 50–80 minutes for a treatment comparison.
Topics	strategic entry; limit pricing; signaling; entry deterrence; industrial organization.
JEL	A22; C72; C92; D82; L12; L13.
Routes	https://limitpricing.beer-lab.org/demo and https://limitpricing.beer-lab.org/room/strategic_entry_en .

Checkpoint

The correct instance contains exactly 22 configurations and four rooms. The basic English room contains three modes and the extended room contains eight. No other game may be launched from this domain.

Access, isolation, and preparation

2.1 Access through the updated laboratory website

Start at <https://beer-lab.org/en/>. Select **CLASSROOM** in the top navigation menu; it opens <https://teaching.beer-lab.org/en/>. In the **Classroom experiments** catalog, use the search box to locate the activity by name. You can also filter by **Topic** or **JEL code**. Clear any filters left from an earlier search before looking for another game.

Each family's card distinguishes **Español** and **English** access links. The **Show extended version** checkbox selects that edition before following a link. Catalog language and session language are separate choices: verify both. Students use the room specified by the instructor; the instructor prepares and monitors the session through this family's own administrative pages.

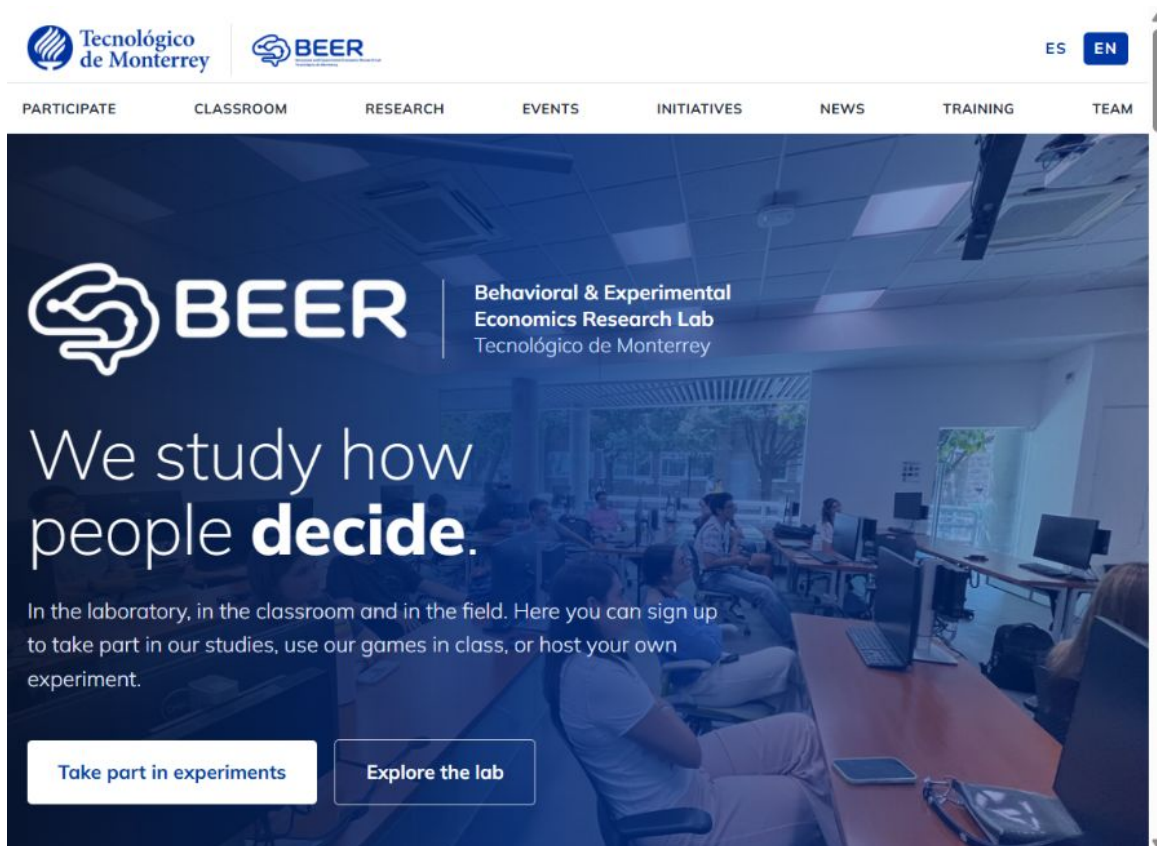


Figure 2.1: Current institutional website. Select **CLASSROOM** in the top navigation menu to open the teaching experiments. Captured on October 7, 2026.



Figure 2.2: Current catalog: search by title, topic, or JEL code. Then locate this family's card and select language and edition. Captured on October 7, 2026.

Checking resources, comprehension, and participant requirements

Before opening the room, check the selected configuration and the number of students present. The session-creation form states the group size and minimum required by that configuration. An individual activity accepts any positive participant count; an interactive activity must satisfy its stated requirement: complete groups when size is fixed, or a minimum participant count when size is flexible. Requirements may change across treatments, for example when adding a third party or changing an institution's size. If you edit a grouping parameter, check the requirement for the edited configuration, rather than relying only on the demo's suggested count.

In the instructions, ensure that students can identify what each role receives, what they can decide, and how the outcome is calculated. An initial account, a distributable budget, and final earnings need not be the same amount. Refer to the resources panel and the example for the selected treatment. Do not carry the basic edition's endowment into a treatment that changes accounts or introduces additional positions.

ECU stands for *Experimental Currency Units*: the activity's unit of account. An outcome of 100 ECU does not automatically equal 100 pesos or 100 dollars. Conversion depends on the session configuration. Before announcing a payment, confirm with the laboratory whether money is paid, the conversion rate, and which decisions count for payment. In hypothetical modules, describe amounts as outcomes in the stated situation.

When a comprehension check is included, an incorrect response receives an explanation beside that question, identifying the submitted answer and the correct answer. Other answers remain in the form. Ask the student to return to the example, locate the relevant rule, and redo the calculation before correcting the response. Avoid revealing answers to the entire class for an individual error, and do not interpret a comprehension mistake as an economic choice in the game.

atégica y precios límite — una ronda	Entrada estratégica y precios límite / Strategic Entry and Limit Pricing — BEER Lab Seleccione una variante de este juego. Select a version of this game.
atégica y precios límite — 10 periodos, misma pareja	
atégica y precios límite — 10 periodos, parejas reasignadas	
try and Limit Pricing — one round	
try and Limit Pricing — 10 periods, same pair	
try and Limit Pricing — 10 periods, reassigned pairs	
atégica extendida — información completa	
atégica extendida — tipo oculto y señalización	
atégica extendida — imitación barata	
atégica extendida — costo de entrada alto	
atégica extendida — subsidio a la entrada	
atégica extendida — compromiso de capacidad	
atégica extendida — historia y reputación	
atégica extendida — regla contra precios por debajo del costo	
rategic Entry — complete information	
rategic Entry — hidden type and signaling	
rategic Entry — cheap mimicry	
rategic Entry — high entry cost	
rategic Entry — entry subsidy	
rategic Entry — capacity commitment	
rategic Entry — history and reputation	
rategic Entry — rule against below-cost pricing	

Figure 2.3: Demo contains only the configurations of this game family, in both languages and editions.

Rooms

Current rooms:

[ES] Entrada estratégica y precios límite
[EN] Strategic Entry and Limit Pricing
[ES] Entrada estratégica y precios límite: extendida
[EN] Strategic Entry and Limit Pricing: extended

Figure 2.4: Rooms contains the four rooms for this family: basic and extended editions in Spanish and English.

Room: [EN] Strategic Entry and Limit Pricing

Create a new session

Session Config

[EN] Strategic Entry and Limit Pricing — one round

Number of participants

Complete groups of 2 participants. Use a multiple of 2; minimum 2.

Create

[Configure session](#) 

App sequence

limit_pricing_game (10 rounds)

Strategic entry and limit-pricing teaching game / Juego docente de entrada estratégica y precios límite.

Figure 2.5: Session-creation form for the basic English room. Check the selected configuration and participant requirement before creating the session.

Downloading a session with several rounds

For the instructor

Open **Data** within the relevant session and use that session's CSV or CSV-for-Excel download link. The general export has one row per participant and columns for the different rounds. Ten rounds do not necessarily mean ten rows per person. When the family provides its own long-format export, observations may instead be organized by participant and round or another unit defined by the design.

Save the original file together with the configuration name, session code, and active-round count. Check that columns for the last active round are present and that the data belong to the selected session. Empty cells can represent inactive rounds, a pending decision, or a field that does not apply to a role; do not automatically recode them as zeros. To compare learning, preserve round and group identifiers alongside participant identifiers. Share only anonymous aggregates in class, and record session incidents before constructing derived tables.

2.2 Institutional route

Begin at beer-lab.org, open the teaching section, continue to teaching.beer-lab.org, and select the strategic-entry card. The proposed domain is limitpricing.beer-lab.org. Instructors use <https://limitpricing.beer-lab.org/demo>; participants use one of four rooms.

Local development uses <http://localhost:8063/demo>. Localhost refers only to the computer running the server. A production class requires the laboratory subdomain or an authorized network address. Never share localhost as a production participant link.

The rooms are `entrada_estrategica_es`, `strategic_entry_en`, `entrada_estrategica_extendida`, and `strategic_entry_extended`. The first pair contains three basic modes by language; the second pair contains eight treatments. Visible names identify language, duration, matching, and

the institutional change.

Roles persist across all rounds. Fixed matching keeps the same incumbent and entrant together. Reassignment preserves each participant's role while changing counterparts. This rule separates learning about pricing from learning about a different position. Tell participants before the first decision.

2.3 Operational checklist

Before class, check connectivity, browser access, even attendance, and the configuration. Create a new session and distribute one unique link per participant. Keep the report private in a separate tab. Do not project participant codes. If a link says that the user no longer exists, it probably belongs to an old session or reset database. Create a new session and use its current links.

Allow five minutes for rules and comprehension. One round is quick, but a useful debrief needs at least fifteen minutes. Ten rounds generally require twenty minutes of play and twenty minutes of discussion. For treatment comparisons, use separate groups or counterbalanced order. Do not announce the precise hypothesis before decisions, because students may try to reproduce the instructor's expected pattern.

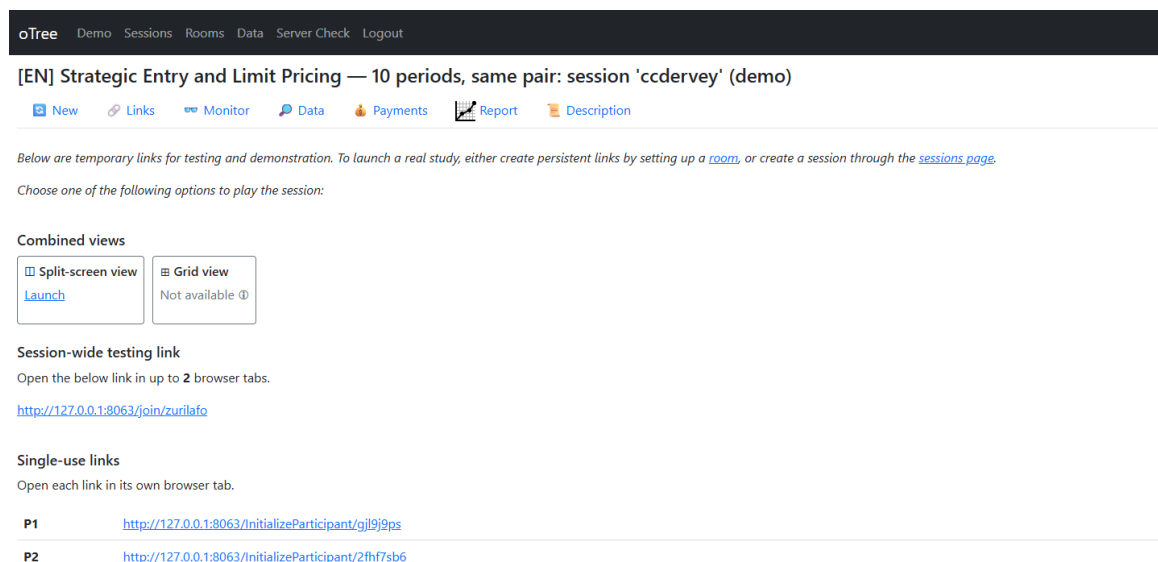


Figure 2.6: Individual links and instructor tools for one session.

Attention

Do not use `resetdb` to fix participant links during class. It deletes sessions and data. Do not switch a treatment after a session has started. Record the incident, preserve the database, and create another session if needed.

Participant journey

3.1 Cover and instructions

The cover shows the laboratory logo, purpose, four rules, and an acceptance box. The English button reads “Begin.” The next screen presents the five-step sequence, price as a signal, the outside option, and the session condition. Blue represents the incumbent and orange represents the entrant, making positions and earnings visually traceable.

The comprehension page checks that the entrant moves after observing price, that a low price can indicate low cost without guaranteeing it, and that staying out pays 30 ECU. Incorrect combinations cannot advance. Attempt count is saved for diagnosis and is never displayed publicly.

3.2 Incumbent screen

The incumbent sees its private type and an economic explanation. A strong type can sustain a low price and compete effectively; a weak type sacrifices more. It chooses 40 or 80 ECU. Under the antitrust rule, a weak incumbent can select only 80 and sees a clear policy notice. The interface does not mark a correct answer.

3.3 Entrant screen

The entrant observes price, type when public, and earnings. With a hidden type, it sees the entry payoff under both strong and weak types and the fifty-fifty prior. This contingent table makes private information different from an unspecified payoff. Capacity adds a notice. Reputation adds up to three prior rounds for the same counterpart.

3.4 Outcome and completion

The outcome reveals type, price, entry, the ex-post best response, and role-specific earnings. A green box offers an interpretation without labeling deviations as mistakes. A blue bar highlights personal earnings. The last round leads to a cumulative summary and an explicit completion screen.



Welcome

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

This activity shows how an incumbent firm can use price to influence a potential rival's entry decision.

General laboratory rules

- Remain quiet and do not talk with other participants.
- Make decisions only on your own computer.
- Do not reveal your type, price, or entry decision.
- If you need help, raise your hand and wait for the instructor.

☐ I have read and accept the laboratory rules.

Begin

Powered by [oTree](#)

Figure 3.1: Beginning the activity. Laboratory welcome and rules.



How the market works



Resources and unit of account

ECU stands for Experimental Currency Units. It is the unit of account for this activity.
This session does not convert ECU into real money.

Complete information

1

The incumbent learns whether its cost type is strong/low or weak/high.

2

The incumbent posts a low price of 40 ECU or a high price of 80 ECU.

3

The entrant observes the price and the information allowed by the treatment.

4

The entrant chooses whether to enter or stay out.

5

The platform computes earnings and reveals the type at the end.

Price as a signal

A low price can sacrifice current profit to suggest that the incumbent has low costs and will be difficult to compete against. The signal does not guarantee the type when a weak firm can mimic it.

Staying out

The entrant receives 30 ECU by staying out. Entry earnings depend on the incumbent's type, the observed price, and the treatment policy.

Condition in this session

Complete information

The entrant observes the incumbent's cost type together with the price.

Your position is preserved throughout the session. Reassignment changes counterparts, not roles. · one interaction

Continue

Powered by [oTree](#)

Figure 3.2: Current basic-edition instructions, with initial resources and experimental units.



Review the marked questions. Each shows your answer and an explanation; your other answers are retained.

Comprehension check

Resources and unit of account

ECU stands for Experimental Currency Units. It is the unit of account for this activity.
This session does not convert ECU into real money.

Complete information

Who decides after observing the price?

Incumbent firm

Your answer: Incumbent firm. The correct answer is Potential entrant. Review the order of moves, the signaling logic, and the outside option.

What can a low price communicate?

It may indicate low costs, but does not guarantee them

How many ECU does the entrant receive by staying out?

30 ECU

Check answers

Powered by [oTree](#)

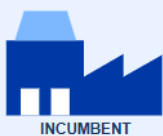
Figure 3.3: Current comprehension check with an incorrect answer, its specific explanation, and retained responses.



Incumbent decision

Round 1 of 10

Complete information



INCUMBENT FIRM

Your private type: Weak: high cost

A low price is costly; mimicking a strong firm can sharply reduce your profit.

Choose the price observed by the potential entrant

Confirm price

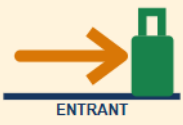
Powered by [oTree](#)

Figure 3.4: The incumbent's price decision.

Entry decision

Round 1 of 10

Complete information


ENTRANT

POTENTIAL ENTRANT
Observed price
80 ECU

Incumbent type
Weak: high cost

Compare your earnings

If you enter
70 ECUIf you stay out
30 ECU

With complete information, the entry figure uses the observed type.

▼

Confirm decisionPowered by [oTree](#)

Figure 3.5: Entry decision with an explicit payoff comparison.



Round result

Round 1 of 10

Complete information

Incumbent type Weak: high cost	Posted price 80 ECU	Entry decision Entered	Was entry optimal with ex-post information? Yes
--	-------------------------------	----------------------------------	---

 Incumbent firm 35.0 ECU	 Potential entrant 70.0 ECU
---	--

Economic interpretation

Compare price with the revealed type. A low price from a strong incumbent can be a credible signal; the same price from a weak incumbent is mimicry. The entrant's response shows how much was learned from price and the institution.

Your earnings

70.0 ECU

Next round

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Figure 3.6: Individual and cumulative results. Round outcome with differentiated roles.



Activity completed

You have completed all decisions. Please wait quietly for the instructor's directions.

Cumulative ECU
410.0 ECU

Rounds with a low price in your
market
5

Rounds with entry in your market
7

Finish

Powered by [oTree](#)

Figure 3.7: Explicit activity completion.

Payoffs, game tree, and predictions

4.1 Pedagogical payoff matrix

The entrant earns 30 ECU by staying out. Entry yields 15 or 45 against a strong type after the low or high price, and 65 or 70 against a weak type. A strong incumbent earns 75 without entry and 60 with entry after a low price; after a high price it earns 100 and 40. A weak incumbent earns 15 and 5 after a low price, and 90 and 35 after a high price. Treatments modify identified components.

Type	Price	Inc. if out	Inc. if entry	Entrant if entry	Entrant if out
Strong	40	75	60	15	30
Strong	80	100	40	45	30
Weak	40	15	5	65	30
Weak	80	90	35	70	30

These are not estimates from a specific industry. They are a discrete calibration that produces transparent incentive tensions. The strong type may sacrifice the high-price margin to avoid entry. Mimicry is costly for the weak type. The entrant prefers staying out against tough competition and entering against a weak incumbent. Confirm that students compare the correct cells before deriving equilibrium.

4.2 Complete information and backward induction

Solve the entry node first. Against a strong type after 40, entry pays 15 rather than 30, so the entrant stays out. Against a strong type after 80, entry pays 45, so it enters. Against a weak type, entry pays 65 or 70, so it enters after either price. Anticipating this response, the strong incumbent compares 75 with deterrence to 40 after high-price entry and chooses 40. The weak incumbent compares 5 after low-price entry to 35 after high-price entry and chooses 80.

This benchmark illustrates why timing matters. Starting at the first node may tempt students to select the monopoly payoff of 100 or 90 while ignoring entry. Backward induction incorporates the response. It also disciplines threats: a planned response must be optimal when its node is reached.

Theoretical foundation

A strategy specifies an action at every information set, including paths that do not occur. An observed action is only the decision on the realized path. Subgame perfection removes

noncredible threats in complete-information games.

4.3 Hidden type and signaling

With private type, the entrant observes price and forms $\mu(p) = \Pr(\text{strong} \mid p)$. Expected entry earnings equal $\mu(p)u_E(\text{enter}, S, p) + (1 - \mu(p))u_E(\text{enter}, W, p)$ and are compared with 30. Price separates types only when the strong incumbent accepts the signaling cost and the weak incumbent does not want to mimic.

In a candidate separating equilibrium, 40 identifies strong and 80 identifies weak. The entrant stays out after 40 because 15 is below 30 and enters after 80 because 70 exceeds 30. The strong incumbent obtains 75 from separation rather than 40 after high-price entry. The weak incumbent obtains 35 from high-price entry rather than 15 from imitating and inducing exit. Both incentive constraints hold.

Bayes' rule determines beliefs on positive-probability paths. Off-path beliefs require additional restrictions. A classroom discussion need not solve every refinement, but it should make clear that “low price means strong” is an equilibrium implication of costs and strategies rather than a semantic rule.

4.4 Pooling, mimicry, and error

When imitation becomes cheap, the weak type may choose 40 to induce exit. Anticipating mimicry, the entrant lowers its posterior belief that a low price comes from a strong type and may enter. The signal loses value because it is no longer differentially costly. Policy or technology can therefore move the market among separating, pooling, and semi-separating patterns.

Observed decisions do not directly reveal beliefs. An entrant that stays out may assign a high probability to strong type, dislike risk, or follow a heuristic. One that enters may infer mimicry, value competition, or err. Belief claims require repeated choices, direct elicitation, or a structural model. Use the phrase “consistent with” when evidence is not identifying.

Instructor report and data interpretation

5.1 Controlled reveal

The report counts participants, decisions, and interactions. While decisions remain, it shows a warning and disables reveal. After completion, the instructor selects “Show results.” “Hide results” restores the protected view. This prevents public information from affecting current decisions.

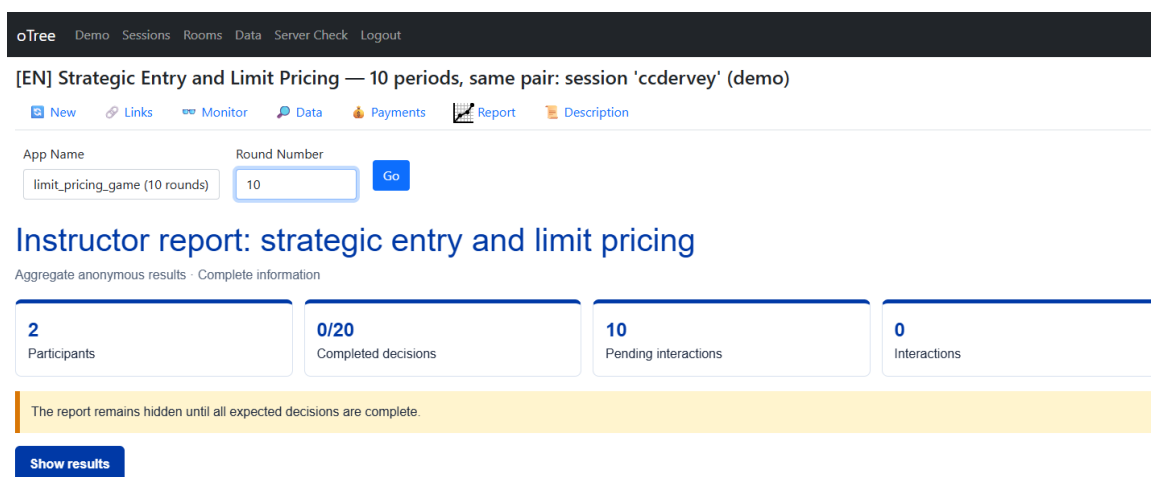


Figure 5.1: Instructor control of information. Report hidden while decisions remain.

5.2 Recommended reading order

Start with denominators. Continue with low prices, entry, deterrence, and ex-post best response. Use entry response by price to see whether 40 and 80 induced different reactions. The type table shows whether strong and weak incumbents priced differently. End with round evolution to identify learning or end effects.

Deterrence is one minus entry and is not an efficiency measure. Ex-post best response uses the true type; under private information, a sensible ex-ante choice can be wrong ex post. Role earnings describe distribution but omit consumer surplus and fiscal cost. Do not call their sum welfare without a clear qualification.

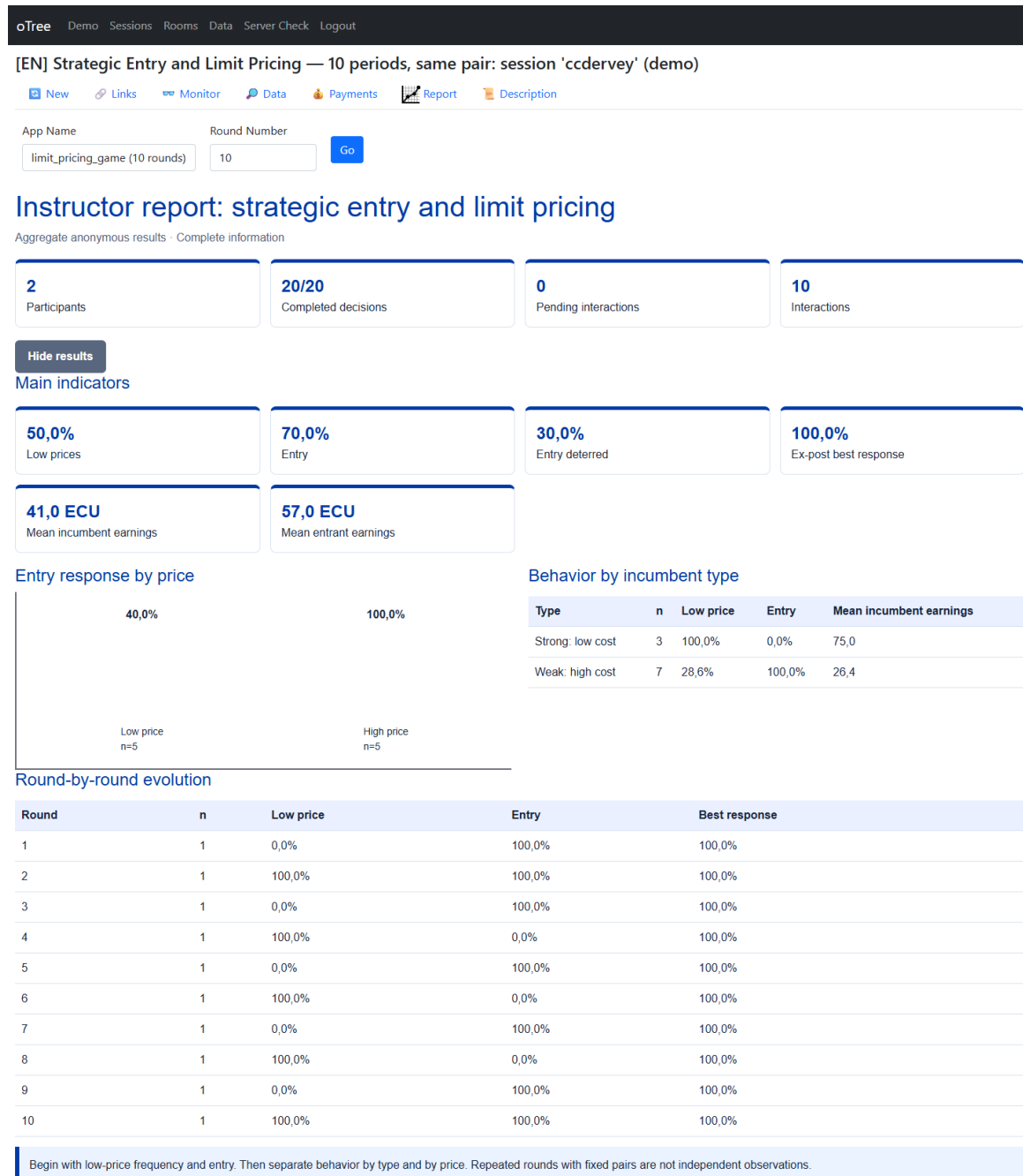


Figure 5.2: Aggregate report after reveal.

Feedback script

Project entry response by price and ask what inference could produce it. Then show behavior by type. If types priced alike, discuss credibility. If they priced differently but entry did not respond, examine beliefs and comprehension. Reveal earnings last.

5.3 Experimental unit and export

Ten rounds from a fixed pair form one dependent trajectory. Reassignment still leaves repeated observations from each person. Use descriptive comparisons in class and avoid naive standard errors at the decision level. Research use requires pre-specified hypotheses, clustering, and exclusions.

The export records session, participant, round, language, edition, treatment, matching, group, role, type, type publicity, price, entry, profitability, best response, earnings, and comprehension. Preserve the original file, analyze a copy, and document transformations. Never project participant codes.

Extended family: treatment notes

6.1 Complete information

6.1.1 What changes and what remains fixed

The entrant observes the incumbent's cost type together with price. Price is no longer needed to infer costs, although it still changes the incumbent's earnings. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under "Condition in this session" explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.1.2 Economic prediction

The strong incumbent chooses the low price when deterrence offsets the sacrifice; the weak incumbent prefers the high price and accommodates entry. The entrant compares entry earnings directly with the 30 ECU outside option. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor's task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.1.3 Teaching use and report

This treatment supplies the benchmark for backward induction and separates the direct payoff effect of price from its informational content. When reading the report, compare entry by type,

the share of ex-post best responses, and the private cost of attempted deterrence. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `complete_information`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.2 Hidden type and signaling

6.2.1 What changes and what remains fixed

Only the incumbent knows whether it is strong or weak. The entrant knows a fifty-fifty prior and observes price before deciding. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under “Condition in this session” explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.2.2 Economic prediction

A separating equilibrium requires the low price to be attractive enough for the strong type and costly enough for the weak type. Beliefs following each price sustain or destroy separation. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor’s task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.2.3 Teaching use and report

This treatment introduces perfect Bayesian equilibrium, belief updating, and the distinction between a costly signal and cheap talk. When reading the report, contrast prices by type, entry after each price, and the entrant's ex-post mistakes. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `hidden_type`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.3 Cheap mimicry

6.3.1 What changes and what remains fixed

The weak incumbent earns more from a low price, especially when it keeps the rival out. The signal is therefore cheaper to imitate. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under “Condition in this session” explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.3.2 Economic prediction

When the weak type's incentive constraint fails, a low price no longer identifies a strong incumbent clearly. Entrants should enter more often after a low price. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor's task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.3.3 Teaching use and report

The comparison shows that signals work through differential costs rather than labels or the sender's stated intention. When reading the report, look for low prices by weak incumbents and compare entry responses with the hidden-type treatment. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price-type-entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `cheap_mimicry`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.4 High entry cost

6.4.1 What changes and what remains fixed

Entry subtracts 25 ECU from the potential rival's earnings. The cost can represent irreversible investment, permits, initial advertising, or technological adaptation. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under “Condition in this session” explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.4.2 Economic prediction

The set of states in which entry beats the outside option becomes smaller. Deterrence may occur after a high price, so absence of entry does not by itself demonstrate limit pricing. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor’s task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes’ rule on positive-probability paths and treat off-path events carefully.

6.4.3 Teaching use and report

The treatment separates structural barriers from strategic conduct and clarifies why exclusion requires a counterfactual. When reading the report, separate deterrence due to cost from deterrence due to price and ask whether the incumbent still sacrifices margin. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `high_entry_cost`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.5 Entry subsidy

6.5.1 What changes and what remains fixed

Entry adds 20 ECU to the potential rival's payoff. The subsidy can represent credit, technical assistance, simpler permits, or entry promotion. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under "Condition in this session" explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.5.2 Economic prediction

Entry becomes profitable in more states and a low price loses deterrent power. The incumbent may abandon deterrence or try it more frequently. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor's task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.5.3 Teaching use and report

The treatment opens a discussion of policy incidence, competition, and fiscal cost without pretending to be a complete regulatory model. When reading the report, compare entry, role-specific earnings, and best responses before concluding that more entry increased welfare. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `entry_subsidy`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.6 Capacity commitment

6.6.1 What changes and what remains fixed

A low price is paired with observable installed capacity. Entry earnings fall by 15 ECU, and the incumbent's payoffs also change. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under "Condition in this session" explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.6.2 Economic prediction

Capacity can make an aggressive post-entry response credible, but it is costly when entry does not occur. Commitment works by altering future payoffs as well as beliefs. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor's task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.6.3 Teaching use and report

This design connects limit pricing to strategic investment, sunk costs, and the capacity-commitment models of Spence and Dixit. When reading the report, separate the cost of capacity, its entry effect, and the frequency with which investment remains idle. Compare independent experimental

units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `capacity_commitment`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.7 History and reputation

6.7.1 What changes and what remains fixed

Each entrant observes up to three prior rounds for the same counterpart: price, entry, and revealed type. Roles and matching remain fixed. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under “Condition in this session” explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.7.2 Economic prediction

History supports a reputation for strength or aggressive conduct. With a finite horizon, backward induction creates tension with reputation building early in the interaction. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor’s task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.7.3 Teaching use and report

The treatment studies learning, path dependence, and the distinction among persistent type, strategic conduct, and homemade priors. When reading the report, plot behavior over rounds and ask whether history matters after accounting for revealed type. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `reputation_history`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

6.8 Rule against below-cost pricing

6.8.1 What changes and what remains fixed

A weak incumbent cannot post the low price. The rule simplifies a policy intended to prevent prices that a high-cost firm could not sustain. The two roles, sequential order, 40 and 80 ECU prices, 30 ECU outside option, and end-of-round type revelation remain fixed. Holding these elements constant makes a descriptive treatment difference easier to interpret than a comparison that changes information, payoffs, and duration at once.

What participants will see

The screen preserves the same visual identity and order of moves. The text under “Condition in this session” explains the change before a decision. The incumbent still sees its type; the entrant sees price, authorized information, and the relevant contingent payoffs. Aggregate results remain hidden while other participants are deciding.

6.8.2 Economic prediction

A low price becomes a more informative signal of strength. Yet restricting prices may raise consumer prices and affect entry ambiguously. This is a conditional prediction based on ECU maximization, common understanding of payoffs, and consistent beliefs. Behavior may depart because of error, risk attitudes, preferences for competition, overconfidence, or incomplete learning. The instructor's task is to locate which step of the prediction failed rather than label every deviation irrational.

Theoretical foundation

State the comparison in terms of strategies and beliefs. The incumbent selects price while anticipating the subsequent response; the entrant selects entry using price and available information. With hidden types, an observed frequency does not identify beliefs by itself. Apply Bayes' rule on positive-probability paths and treat off-path events carefully.

6.8.3 Teaching use and report

The comparison supports discussion of cost-based legal tests, regulatory errors, and the difference between protecting competition and protecting competitors. When reading the report, compare credibility, prices, entry, and earnings rather than judging the rule only by the number of entrants. Compare independent experimental units: a fixed pair playing ten rounds supplies one trajectory, not ten independent replications. Present counts and distributions first, averages second, and price–type–entry relationships last.

For the instructor

Do not add the treatment merely for variety. Before class, write an identification question: which parameter changes, which decision should respond, and which pattern would reject the main explanation. Use the same instruction script across groups intended for comparison.

Feedback script

Ask: what did the entrant observe, what did the incumbent know, what sacrifice did the low price create, did the weak type mimic, and was entry profitable ex post? Then contrast entry following 40 and 80 ECU. Close by separating deterrence, signaling, and welfare.

Checkpoint

The treatment code is `antitrust_rule`. Confirm language, extended edition, ten periods, and fixed matching. Verify that the report identifies the intended treatment before sharing links.

Experimental evidence and literature

7.1 From classical intuition to incomplete information

The traditional limit-pricing intuition is that an incumbent charges less before entry to make the market unattractive. Under complete information, a past price that does not alter future payoffs should not affect a rational entrant because entry profitability is known. [Milgrom and Roberts \(1982\)](#) show how private cost information restores a role for price. The distortion can signal strength, but incomplete information need not always lower entry.

Capacity supplies a different channel. [Spence \(1977\)](#) and [Dixit \(1980\)](#) show that irreversible investment can modify post-entry competition and make an otherwise empty threat credible. A signal changes beliefs; a commitment changes future actions or payoffs. One decision may do both, but the explanation should identify the operative mechanism.

Reputation arises when current action changes future rivals' beliefs. [Kreps and Wilson \(1982\)](#) show how a small probability of a committed type can support reputation. [Camerer and Weigelt \(1988\)](#) find that a sequential reputation model organizes much experimental behavior while documenting a homemade prior that some players are committed. Equilibrium disciplines interpretation without predicting every individual perfectly.

7.2 Entry and learning in the laboratory

[Mason et al. \(1998\)](#) study an entry-deterrence game based on sunk investment. They observe deterrence attempts, some entry with negative net earnings, and incomplete learning. Experience reduces some deviations without eliminating them. These patterns motivate repeated modes and reporting best responses without moralizing them.

[Müller et al. \(2009\)](#) analyze limit pricing with private information in an oligopoly. Receivers respond to price and signal content depends on the environment. The direction of an intuitive signal can vary across models: low price may signal efficiency, while in another structure high price may signal common high costs. Tie every inference to the actual payoff table.

Exclusion policy adds welfare and regulatory error. [Edlin et al. \(2019\)](#) show experimentally that pricing rules can change entry and welfare in ways a simple criterion may miss. Avoid two shortcuts: treating every low price as predatory and treating every entry as efficient. Ask about costs, commitment, consumer effects, efficient entry, and policy cost.

Theoretical foundation

Experimental evidence tests joint predictions about preferences, beliefs, comprehension, and institutions. A deviation does not identify which assumption failed. Use the activity to compare patterns and mechanisms, not to infer individual motives from one choice.

Lesson plans and feedback scripts

8.1 Fifty-minute class

Use five minutes for rules, five for comprehension, ten for play, and twenty-five for discussion. Draw the public-type tree and solve from entry backward. Project the report and compare prices by type. Close by asking what changes when type becomes private. This route emphasizes backward induction and credible threats.

8.2 Ninety-minute class

Run complete and hidden information with separate groups or counterbalanced order. Collect anonymous predictions before showing data. Compare type-specific prices, price-specific entry, and best responses. Work one Bayesian calculation. Finish with cheap mimicry or capacity to distinguish signaling from commitment. Reserve ten minutes for an individual written conclusion.

8.3 Question sequence

Move from facts to mechanism and evaluation. First ask how many chose 40, how entry varied by price, and whether types differed. Next ask which belief makes entry optimal after 40, whether the weak type wanted to mimic, and whether price changed payoffs or only information. Then ask whether profitable entry was blocked, who gained, and what is missing for consumer welfare. Finish by asking which policy changes an incentive constraint and what unintended effect it may create.

Feedback script

“We observe actions first. We reconstruct the entrant’s best response next. We then ask what the incumbent anticipated. Only at that point do we interpret price as signal or commitment. We evaluate earnings and omitted welfare components last.”

8.4 Common mistakes

The first mistake is defining low price as strong type; cheap mimicry corrects it. The second is reading exit as automatic proof of anticompetitive conduct; high entry cost supplies the counterexample. The third is solving from the first node; return to the later decision. The fourth is using revealed type to judge a choice made without it; separate ex-ante rationality from ex-post

accuracy. The fifth is calling the sum of firm earnings welfare; add consumers, real costs, and the public budget.

8.5 Mini-cases for leading the discussion

Use short cases so the class applies the mechanism before hearing an explanation. In the first case, a strong incumbent posts 40 ECU and the entrant stays out. Ask what additional observation would distinguish a credible signal from coincidence. A useful answer mentions weak incumbents, entry after each price, and the complete-information counterfactual. One path is consistent with several explanations.

In the second case, a weak incumbent posts 40 ECU, the entrant stays out, and the incumbent earns more than it would under entry. Reconstruct the incentive constraint. If imitation pays more than revealing weakness through 80 ECU, separation is unsustainable. Connect the logic to warranties, certification, or education: a signal separates types when its cost or benefit differs sufficiently across them.

In the third case, almost nobody enters even after a high price. Before attributing the pattern to reputation, inspect entry cost. If the outside option exceeds entry earnings in several states, limited competition reflects a structural barrier. Ask students for a policy and a side effect. A subsidy may raise entry while financing low-value projects; restricting low prices may improve inference while increasing the price paid by consumers.

In the fourth case, the incumbent installs capacity and then faces no entry. Ask whether capacity was wasted. The answer requires a counterfactual: investment can be costly and still deter entry that would have reduced incumbent earnings. This does not establish social efficiency. Close by requiring a three-part statement: observed evidence, a compatible mechanism, and a missing datum. The format discourages excessive causal claims and prepares disciplined use of the instructor report.

Assessment and worked exercises

9.1 Conceptual questions

1. Explain why a prior price without commitment should not affect entry under complete information when future payoffs are known.
2. Define a strategy for each player in the two-type, two-price game.
3. Compute expected entry earnings after 40 when the posterior probability of strong type is 0.7. Use 15 and 65 and compare with 30.
4. State both incentive constraints for separation.
5. Explain why capacity and signaling are different mechanisms.
6. Propose one descriptive measure of mimicry and one measure of entrant response.
7. Explain why ten rounds from one pair are not ten independent observations.
8. Evaluate the antitrust rule using competition, consumers, regulatory errors, and payoffs.

9.2 Suggested solutions

Expected entry earnings in question three are $0.7(15) + 0.3(65) = 30$, so the entrant is indifferent. A posterior above 0.7 favors staying out and one below 0.7 favors entry. Belief, not price alone, determines the response.

For separation, the strong type must prefer 40 with exit to 80 with entry: 75 exceeds 40. The weak type must prefer 80 with entry to mimicking 40 with exit: 35 exceeds 15. If mimicry pays 50, the second condition fails and the entrant must revise its inference. Receiver best response alone is not enough; sender incentives must also hold.

For capacity, report entry conditional on commitment and the capacity cost when entry does not occur. For reputation, compare pair-level paths and revealed types. For regulation, report prices, profitable entry, role earnings, and the missing consumer surplus. A complete answer states the counterfactual.

Checkpoint

A strong answer identifies available information, shows the calculation, names the experimental unit, and separates evidence from interpretation. Reward mechanism clarity.

9.3 Troubleshooting and operational close

If a page remains at “Please wait,” confirm that both links in the pair are open and that neither participant closed the browser before submitting. If a room shows other games, the instance is not scoped with `GAME_FAMILY=limitpricing`. If Demo contains 44 or more configurations, the game block may have been appended after family scoping; configurations must load before the catalog is filtered.

If language is mixed, verify the selected configuration. If an outcome seems inconsistent, export data and inspect type, price, entry, and treatment in the same row. Capacity, subsidy, and entry-cost treatments modify the base table. If the report cannot reveal, check pending interactions rather than forcing incomplete statistics.

After class, export data and record date, course, configuration, attendance, incidents, and feedback questions. Close unused sessions. Keep the data file and code version. Before the next class, run a test session on the production domain; local validation does not confirm DNS, database, or proxy configuration.

Attention

Do not use classroom decisions to rank students publicly, reveal individual types, or attribute anticompetitive intent. The report is designed for aggregate and anonymous learning.

Configurations and variables

Six basic configurations represent three modes in two languages: one round, ten fixed-pair periods, and ten reassigned-pair periods. Sixteen extended configurations represent eight treatments in two languages. All use `limit_pricing_game`, persistent roles, and two participants per market. The proposed domain is <https://limitpricing.beer-lab.org/>.

Core variables are `incumbent_type`, `incumbent_price`, `entrant_decision`, `entry_profitable`, `entrant_best_responded`, `incumbent_payoff`, `entrant_payoff`, `role_name`, `round_earnings`, and `comprehension_attempts`. Export also includes `language`, `edition`, `treatment`, `matching`, `group`, and `whether_type_was_public`.

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