



Political Innovation Blocking: Instructor Guide

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 the preparation, implementation, and classroom discussion of the family of political innovation blocking games available through the Behavioral and Experimental Economics Research Lab (BEER Lab) at the Department of Economics of Tecnológico de Monterrey. It is intended for instructors with different levels of familiarity with experimental and behavioral economics.

The document offers three reading paths. The **quick guide** is enough to launch a session. The operational chapters explain each screen used by instructors and students. The conceptual chapters present the theories, predictions, and empirical findings needed to lead the post-game discussion.

Access instructions and common screens are explained once. Each variant then focuses only on what changes relative to the basic game: configuration, group size, decisions, predictions, relevant outcomes, and academic literature.

Author

This guide was prepared by Stanislaw Maldonado, research professor in the Department of Economics at Tecnológico de Monterrey, Monterrey Campus. For questions or suggestions about its content, please contact the author at stanislao.maldonado@tec.mx.

For the instructor

This guide follows the English-language interface. Spanish configurations use the same logic. Never project individual codes or connect outcomes to names, student identification numbers, or seats in the room.

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Preparation and access to the activity

1.1 The question organizing the class

An innovation can expand what a society produces while reducing the advantage of the person who controls its adoption. This activity separates those consequences. One concerns productive income received by all three people in a group. The other concerns the probability of keeping a rent associated with office. The instructor does not need to specify an actual technology or assign real political identities. Students only need to understand who can authorize the change, what productive benefit it creates, and how the distribution of probabilities changes when it is adopted.

The learning objective is to explain blocking through identifiable incentives. The exercise does not presume that every incumbent rejects economic development or that people benefiting from innovation can always compensate those who lose. Students must distinguish the aggregate outcome from the individual position of the decision maker. They also learn to compare a choice under uncertainty with the outcome of the subsequent draw. An option may be advantageous before that outcome is known and still produce an unfavorable realization in one particular encounter.

Three people participate in the basic game. Position A authorizes or prevents a project; B represents a possible recipient of the office rent when A does not retain it; C represents citizens who receive the productive increase and do not enter that draw. Participant screens use only letters, accounts, projects, and bonuses. These terms make the options understandable without announcing a hypothesis or recommending a strategy. The political interpretation belongs to the instructor discussion after decisions have been recorded, rather than to the instructions used while students choose.

For the instructor

Present the neutral rules first and let participants decide privately. Reserve “political replacement”, “office rents”, and “innovation blocking” for the discussion. This is an original classroom adaptation of the replacement mechanism, using parameters chosen to make the divergence between productive gains and private incentives visible.

1.2 Family facts

Purpose	Explain why an authority may block a productive improvement threatening the rent associated with office.
Suggested duration	20–35 minutes; repeated encounters: 35–50 minutes.
Participants	Multiple of three; minimum three; reassignment: minimum six.
Experimental unit	A group of three people with constant positions A, B, and C.
Basic edition	One encounter; ten with a fixed group; ten with random reassignment.
Extended edition	Nine conditions: benchmark, protected continuity, low or high office value, guarantee, promise, competition, and two uncertainty conditions.
Decision	A authorizes the project; C chooses compensation where applicable; B chooses expenditure under competition.
Payoff	An individual endowment of 100 ECU, productive increase, one bonus assigned to A or B, transfers, and competition cost where applicable.
Topics	technological innovation; political replacement; political rents; technology adoption; compensation; political competition.
JEL	A22, C92, D72, O33, O38, O43.

Each language has three basic configurations and nine extended configurations. Demo contains twenty-four configurations, and the rooms page provides four access points. A group requires a multiple of three participants. Random reassignment requires at least six people because there must be more than one group for counterparts to change. Demonstrations use six participants, making two complete groups. This size allows activation and blocking to appear in the same session, although the underlying choices still belong to different people rather than different decisions by one authority.

The platform family key is **innovationblocking**. One application serves both languages and editions, so a language switch does not change payoff formulas. The instructor selects the condition before creating a session. Probabilities, bonuses, and budgets should not change while participants are deciding. When preparing a comparison, first record which parameter changes and which conditions remain constant. This simple planning sheet later helps interpret behavioral differences without attributing them to an institutional treatment broader than the one actually implemented in the activity.

1.3 Navigation from the laboratory

Institutional access starts at <https://beer-lab.org/>. In the current English navigation, *Classroom* leads to the teaching catalog at <https://teaching.beer-lab.org/>. The catalog supports searches by title, topics, and JEL codes, with Spanish and English links on each card. After this family is published, its card will lead to the corresponding rooms. The screenshot documents the general navigation checked during preparation; it does not establish that a newly prepared card is already public. Implementation and guides can be complete locally before public deployment.

The stable game address is <https://innovationblocking.beer-lab.org/>. The Spanish basic room is https://innovationblocking.beer-lab.org/room/innovacion_es. The English basic room is https://innovationblocking.beer-lab.org/room/innovation_en. Extensions use https://innovationblocking.beer-lab.org/room/innovacion_extendido and https://innovationblocking.beer-lab.org/room/innovation_extended. These four

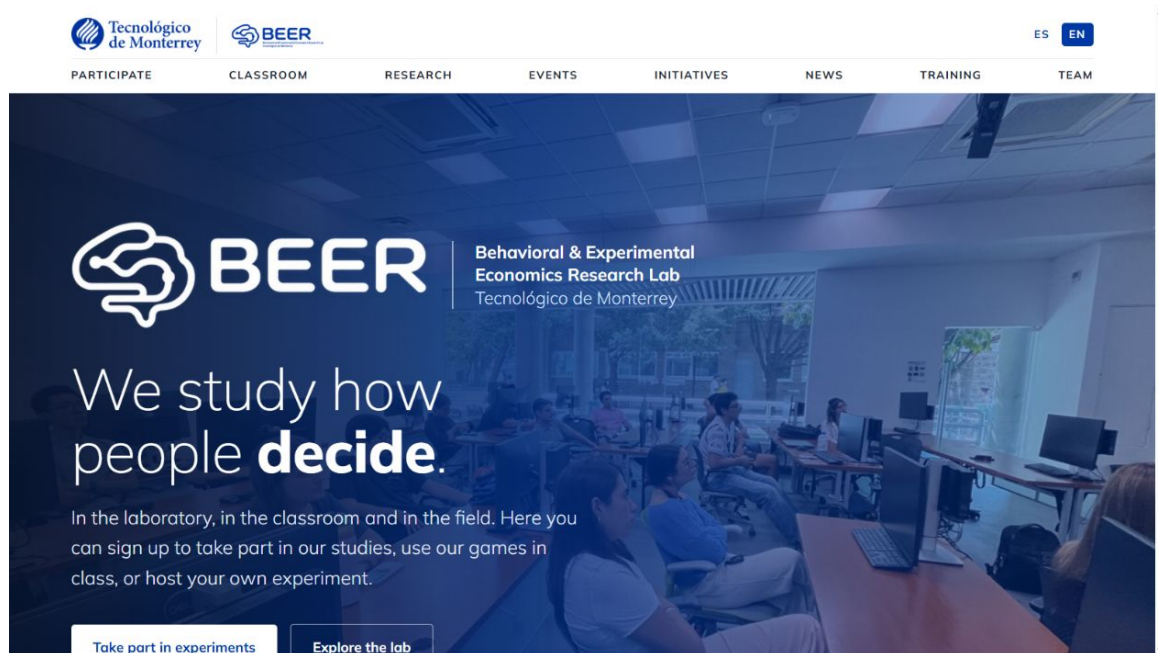


Figure 1.1: Institutional website: Classroom connects to the teaching catalog.

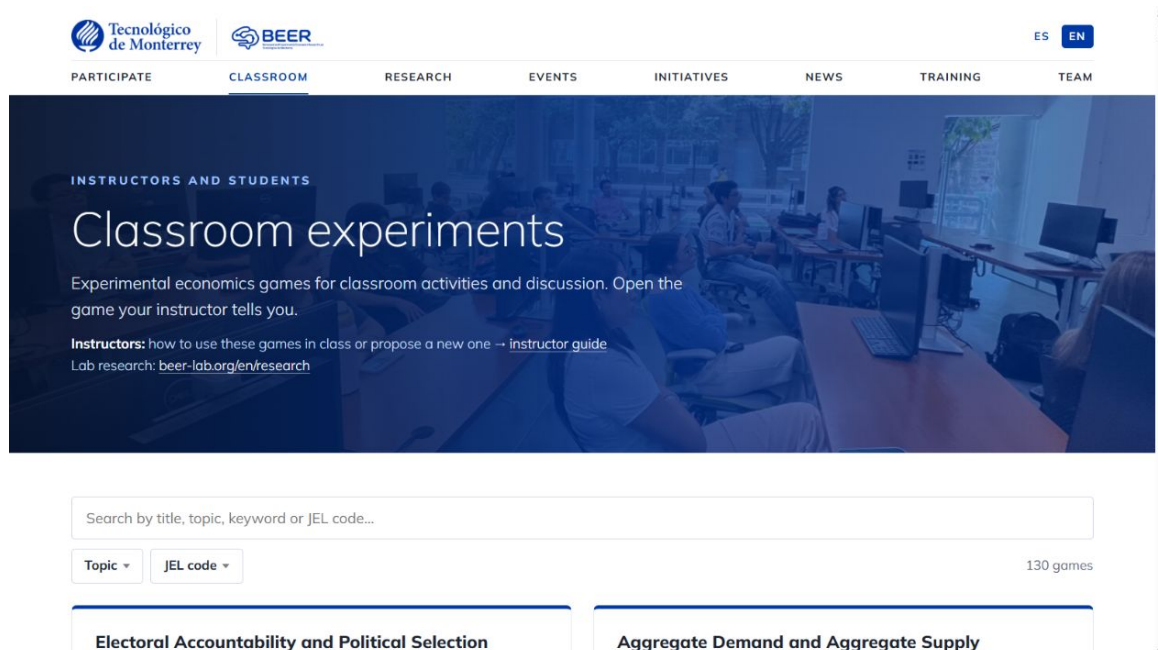


Figure 1.2: Current teaching catalog. Search and filters locate a family after its publication.

routes distinguish language and edition. They are not four independent games: they share one experimental structure while offering different comparisons and access options for teaching.

Participant entry through a room differs from instructor access. The instructor creates the session and obtains individual links; each student uses only the link assigned to them. A room facilitates assigning connections, but does not replace selection of an appropriate configuration or verification of group size. The instructor also has a private report. Its address contains the session code, making it important to check that the displayed activity is the newly created session rather than an earlier demonstration with another treatment or another group of students.

1.4 Demo, rooms, and session creation

On this family's domain, Demo must show only its twenty-four innovation-blocking configurations. Rooms must show exactly four rooms. The Spanish basic room offers only the three Spanish basic formats; the English room offers the same formats in English. Extended rooms offer the nine conditions in their corresponding language. The first selection in a basic room must be a basic encounter. These indicators provide a practical access check, especially when the laboratory is preparing several teaching games at the same time.

The screenshot shows the oTree web interface. At the top is a navigation bar with links: oTree, Demo, Sessions, Rooms, Data, Server Check, and Logout. Below this is a section titled "Demo". On the left, there is a table with 12 rows, each representing a game configuration. On the right, there is a sidebar with the game title and instructions.

Demo	
Bloqueo político de innovaciones · ES · Un encuentro	Bloqueo político de innovaciones / Political Blocking of Innovation — BEER Lab Seleccione una variante de este juego. Select a version of this game.
Bloqueo político de innovaciones · ES · Diez encuentros con grupo fijo	
Bloqueo político de innovaciones · ES · Diez encuentros con reasignación	
Bloqueo político de innovaciones · ES · Extendida · Amenaza de reemplazo: referencia	
Bloqueo político de innovaciones · ES · Extendida · Innovación políticamente segura	
Bloqueo político de innovaciones · ES · Extendida · Menor valor del cargo	
Bloqueo político de innovaciones · ES · Extendida · Mayor valor del cargo	
Bloqueo político de innovaciones · ES · Extendida · Compensación condicional garantizada	
Bloqueo político de innovaciones · ES · Extendida · Compensación prometida y voluntaria	
Bloqueo político de innovaciones · ES · Extendida · Competencia política elegida	
Bloqueo político de innovaciones · ES · Extendida · Beneficio incierto sin información adicional	
Bloqueo político de innovaciones · ES · Extendida · Beneficio incierto y señal privada	

Figure 1.3: The isolated Demo instance: basic formats and Spanish conditions.

Before distributing links, open the selected configuration and confirm language, horizon, and participant count. One encounter introduces the divergence between production and the authority's interest. Ten encounters with a fixed group allow discussion of learning and expectations about the same people. Ten with reassignment change counterparts while preserving positions. Reassignment is random and allows repeated counterparts; it does not guarantee ten different people for each authority. Explain this distinction when comparing learning or social behavior across formats, rather than treating the random format as complete anonymity.

After creating the session, verify that everyone is connected and that each group contains three members. Do not use fictional students to complete a group later interpreted as actual classroom behavior. If one or two students remain, form another group when enough people are available or temporarily assign an observation task outside the experimental data. The report distinguishes participants from group-encounters: six participants in a one-encounter session create two adoption observations, not six. This is a useful first example of why the relevant unit of analysis follows the decision structure.

Political Blocking of Innovation · EN · One encounter	
Political Blocking of Innovation · EN · Ten encounters with a fixed group	
Political Blocking of Innovation · EN · Ten encounters with reassignment	
Political Blocking of Innovation · EN · Extended · Replacement threat: benchmark	
Political Blocking of Innovation · EN · Extended · Politically safe innovation	
Political Blocking of Innovation · EN · Extended · Lower value of office	
Political Blocking of Innovation · EN · Extended · Higher value of office	
Political Blocking of Innovation · EN · Extended · Guaranteed conditional compensation	
Political Blocking of Innovation · EN · Extended · Promised and voluntary compensation	
Political Blocking of Innovation · EN · Extended · Chosen political competition	
Political Blocking of Innovation · EN · Extended · Uncertain benefit without additional information	
Political Blocking of Innovation · EN · Extended · Uncertain benefit and private signal	

Figure 1.4: Continuation of Demo: English formats and conditions.

oTree

[Demo](#)[Sessions](#)[Rooms](#)[Data](#)[Server Check](#)[Logout](#)

Rooms

Current rooms:

Bloqueo político de innovaciones · Básica · ES
Bloqueo político de innovaciones · Extendida · ES
Political Blocking of Innovation · Basic · EN
Political Blocking of Innovation · Extended · EN

Figure 1.5: Four rooms separated by language and edition.

oTree Demo Sessions Rooms Data Server Check Logout

Room: Political Blocking of Innovation · Basic · EN

Create a new session

Session Config

Political Blocking of Innovation · EN · One encounter

Number of participants

Complete groups of 3 participants. Use a multiple of 3; minimum 3.

Create

[Configure session](#) ⚙️

App sequence

innovation_blocking_game (10 rounds) Political Blocking of Innovation / Bloqueo político de innovaciones

0 participants present

Start links

These URLs will stay constant for new sessions, even if the database is recreated.

Room-wide URL

Here is the room-wide URL anyone can use. Don't use this link when testing in multiple tabs on the same browser, because all tabs will be assigned to the same participant, using a cookie.

http://localhost:8132/room/innovation_en

Figure 1.6: English basic room: choose one encounter or a ten-encounter format, with a multiple of three participants.

Attention

An active local instance does not publish the family online. The preview at <http://localhost:8132/demo> works on the development computer. A remote class requires deployment of the institutional domain and a session created there. Keep the canonical routes in teaching materials and check availability before distributing them to students.

1.5 Pedagogical preparation and prior materials

Allow twenty to thirty-five minutes for one encounter and discussion, or thirty-five to fifty minutes for a repeated format. These are teaching estimates, not measured server performance. Use the first minutes to check connections and explain that ECU is an experimental unit of account. The demonstration session does not convert ECU into real money. If a laboratory activity uses monetary incentives, the instructor must explain its conversion rule and which decisions are paid before the activity begins, so students can understand the actual consequences of their choices.

Prepare two calculations on a sheet kept hidden during decisions: A's expected outcome with and without activation, and the group's total resources under each option. The next chapter develops both. Ask an assistant to review the instructions without assuming familiarity with the mechanism, especially the distinction between a bonus changing recipient and income produced for everyone. Also check that students can correct a comprehension mistake without losing their correct answers or receiving an ECU penalty. Comprehension feedback should explain accounting, rather than telling the authority which strategic option to select.

Preparation includes deciding how treatments will be compared. A class can be divided between the benchmark and protected continuity, or between a guarantee and a voluntary promise. Alternatively, two sessions can run consecutively, with discussion of what experience may have changed. The latter is useful pedagogically but does not provide a clean comparison of groups starting with the same information. Record treatment order, avoid announcing a "correct" behavior before play, and subsequently present observed differences as descriptive evidence from the session rather than as an estimated population treatment effect.

Resources, decisions, and the replacement mechanism

2.1 Three components that must remain separate

The endowment is the amount with which each person begins an encounter: 100 ECU for A, 100 for B, and 100 for C. Productive income is the increase of 40 ECU in every account when A activates the project. The rent associated with office is represented by a 100 ECU bonus delivered to just one position, A or B. That bonus is also delivered without activation. Adding it as though innovation created it would therefore produce an incorrect efficiency comparison, because it is present under both alternatives.

Initial accounts total 300 ECU. Without the project, the activity adds the fixed bonus and the group finishes with 400. Activation adds three increases of 40 and the same bonus, giving 520. The difference of 120 comes entirely from new production. Allocating the bonus changes its recipient but not its aggregate amount. This accounting makes it possible to show that a group can obtain more resources while the option creating them is unfavorable to the authority in terms of expected individual income. The distinction is central to the mechanism rather than a detail of payment implementation.

In compensation conditions, a transfer leaves C's account and enters A's account. It is neither multiplied nor financed by another entity. In the competition condition, B's expenditure is deducted from B's account and enters no other participant account; it is a real resource cost within the exercise. These operations have different effects on totals: transfers redistribute while competition expenditure reduces resources. Preserve this separation when discussing which institution unlocks activation and the cost at which it does so. A higher adoption rate alone is insufficient to evaluate the resulting distribution or net resource use.

Theoretical foundation

The political replacement effect arises when a productive change lowers the probability that its decision maker will keep a rent. This differs from a firm losing sales to a more efficient competitor. Here the authority can prevent the project before it produces, and the relevant private loss comes from the allocation of the political bonus.

2.2 Expected and realized outcomes

A's probability of receiving the bonus is 0.9 when the initial situation is kept and 0.2 when the project is activated. B receives it otherwise. A uniform draw is compared with the relevant

probability after all required decisions have been recorded. Participants do not choose its outcome. There is no separate draw for each person: one outcome determines which position receives the one bonus. Subsequent encounters start again under the configuration's rules. The previous holder of the bonus does not acquire authority to change those rules or decide in place of A.

Expected income is a probability-weighted average of possible outcomes before the draw is known. Keeping the initial situation gives A 200 ECU with probability 0.9 and 100 with probability 0.1, for an expected value of $0.9(200) + 0.1(100) = 190$. Activation gives 240 with probability 0.2 and 140 with probability 0.8, for $0.2(240) + 0.8(140) = 160$. Do not announce that A “receives 160” on the result screen. A receives one of the actual amounts; 160 is the value used to compare options before the random outcome becomes known.

B's calculation uses the complementary probabilities. Without activation, expected income is $100 + 0.1(100) = 110$. With activation it is $140 + 0.8(100) = 220$. C never enters the draw and receives either 100 or 140 according to the project decision. The table collects these values before transfers or competition expenditure are introduced. Expected totals equal realized totals because the bonus is always delivered exactly once and common production is certain in the benchmark. What differs across bonus draws is the allocation of income, rather than the size of the resource total available to the group.

Decision	A	B	C	Total
No project, expected	190	110	100	400
Project, expected	160	220	140	520
Expected difference	−30	110	40	120

An authority activating the project can finish with 240, exceeding the 200 of an authority who keeps the initial situation and retains the bonus. That observation does not invalidate the expected incentive to block. The reverse can occur: a blocking authority loses the bonus and finishes with 100. To teach choice under risk, ask what A knew before choosing and what was learned only afterwards. Avoid evaluating a decision solely by its realized success. The appropriate comparison uses known probabilities and the objectives attributed to the decision maker, not knowledge acquired after the option was selected.

2.3 The adoption condition

Let the individual endowment be w , the productive increase g , the bonus value R , and retention probabilities without and with activation p_0 and p_1 . With guaranteed compensation t , A compares $w + p_0R$ with $w + g + p_1R + t$. The difference in favor of activation is

$$\Delta_A = g - (p_0 - p_1)R + t.$$

The endowment appears on both sides and cancels. A positive productive gain does not guarantee a positive difference: it must be compared with the expected rent loss. In the benchmark, $40 - (0.9 - 0.2)100 = -30$. This expression identifies separately the gain, the probability change, the office value, and credible compensation rather than combining them under an undefined notion of political resistance.

Under exclusively monetary self-interest and risk neutrality, A prefers activation when the difference is positive and keeping the initial situation when it is negative. At zero, both options maximize expected income. This is a reference prediction, not a description of every participant. A may value B's and C's outcomes, feel responsible for the project, or weight probabilities differently.

Because the activity does not elicit those preferences or beliefs, an instructor cannot identify a specific motivation from one choice departing from the monetary calculation. The departure can motivate discussion while its interpretation remains appropriately limited.

Checkpoint

Before revealing the report, calculate: no project with the bonus awarded to A produces (200, 100, 100); activation with the bonus awarded to B produces (140, 240, 140). The bonus appears once in both cases, giving totals of 400 and 520. Then explain why A can prefer the first option in expectation despite the second providing more aggregate resources.

2.4 Screens and decision sequence

The welcome page introduces the laboratory and its general rules. Each participant confirms having read them. Instructions explain accounts, the project, the bonus, probabilities, and renewal between encounters. Comprehension questions verify accounting and allocation of the bonus; transfer conditions also check whether an announcement is binding. A mistake produces the submitted answer, correct answer, and relevant calculation beside the corresponding question. Other answers are preserved. This feedback supports understanding of the mechanism without telling A whether activation is the preferred strategic choice or penalizing students for an initial accounting error.



An activity about projects and allocations

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

One position decides whether to activate a project. Read how each account changes and how the bonus is allocated.

Laboratory rules

- Remain silent and do not communicate outside the options in this activity.
- Make your decisions individually and privately.
- Follow the instructions on the screen.
- Do not refresh, close, or leave the page.
- If you have a problem, raise your hand or contact staff privately.

☐ I have read and accept the rules.

Start

Powered by oTree

Figure 2.1: Institutional welcome and acceptance of laboratory rules.



Encounter 1 of 1 · Your position A

Activity rules

Resources and unit of account

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

This session does not convert ECU into real money.

A chooses to activate the project or keep the initial situation. Activation adds 40 ECU to each of the three accounts. Keeping the initial situation adds none of that increase.

At the end a single bonus of 100 ECU is assigned to A or B. It is a fixed additional resource financed by the activity, with or without the project. C receives no bonus. The draw does not deduct the bonus from anyone's account.

Probability that A receives the bonus: 90% without the project and 20% with it. B receives the bonus otherwise. A single draw occurs after decisions; it does not decide who can act in the next encounter.

Results are added across all active encounters. There is no discount or random selection of a paid round. Accounts and the bonus renew; previous outcomes do not change the next probabilities.

One group of three for one encounter.

Continue

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Figure 2.2: Instructions distinguish starting accounts, productive increases, and the bonus.



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

Encounter 1 of 1 · Your position A

Check the rules

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.

In an example, A activates the project and each account receives 40 ECU. C delivers 0 ECU to A. What is C's result starting from 100 ECU, without any bonus or other cost?

0

Your answer: 0. The correct answer is 140. C starts with 100, receives 40 and pays 0: $100 + 40 - 0 = 140$ ECU. When present, the transfer comes from C.

How many positions receive the bonus in one encounter?

1

Continue

Powered by [oTree](#)

Figure 2.3: An incorrect comprehension answer receives a calculation beside its question while another answer is preserved.

Preparation identifies the position and recalls allocation rules. A chooses about the project; in the benchmark B and C have no additional strategic decision. Observing an outcome is not a vote or consent. Wait pages synchronize the group so A cannot act before others have read the instructions. Extensions with compensation or competition first display C's or B's decision, after which A observes the information permitted by the protocol. Participants with no current decision remain on a wait page, rather than submitting an artificial response that might later be interpreted as a real choice.

Encounter 1 of 1 - Your position A

Prepare your decision

A decides about the project. The bonus may be allocated to A or B. You remain in position A throughout the session, even when B receives the bonus.

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

Probability that A receives the bonus: 90% without the project and 20% with it. B receives the bonus otherwise. A single draw occurs after decisions; it does not decide who can act in the next encounter.

One group of three for one encounter.

[Continue](#)

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

Powered by oTree

Figure 2.4: A's preparation: decision authority remains with A even when another position receives the bonus.

In the benchmark A chooses activation or the initial situation, and the server resolves the bonus draw once. With a guarantee, the resolution delivers the agreed transfer on activation and returns reserved resources on blocking. With a promise, activation leads to C's later transfer choice while blocking finishes without a transfer. Income is calculated only after every required action is complete. Refreshing a page does not provide another chance to receive the bonus, nor does it change the productive state of an uncertain project. This preserves the distinction between a random outcome and a decision under announced rules.

The outcome page shows project status, its potential increase, and the position receiving the bonus. It then separates components of the participant's own result: productive increase, bonus, incoming and outgoing transfers, and expenditure. The initial endowment is added once to those components. The final page presents the cumulative result of all active encounters and asks participants to remain there. Unplayed technical rounds create neither income nor observations. This explicit ending allows the instructor to move to discussion without students interpreting a generic system termination message as part of the experiment or another decision opportunity.

2.5 Repetition without automatic political succession

In ten encounters, accounts renew and results are added without discounting or random selection of a paid round. Receiving the bonus in one encounter does not confer authority in the next. A retains the decision position, B the possible replacement position, and C the citizen position. The repeated

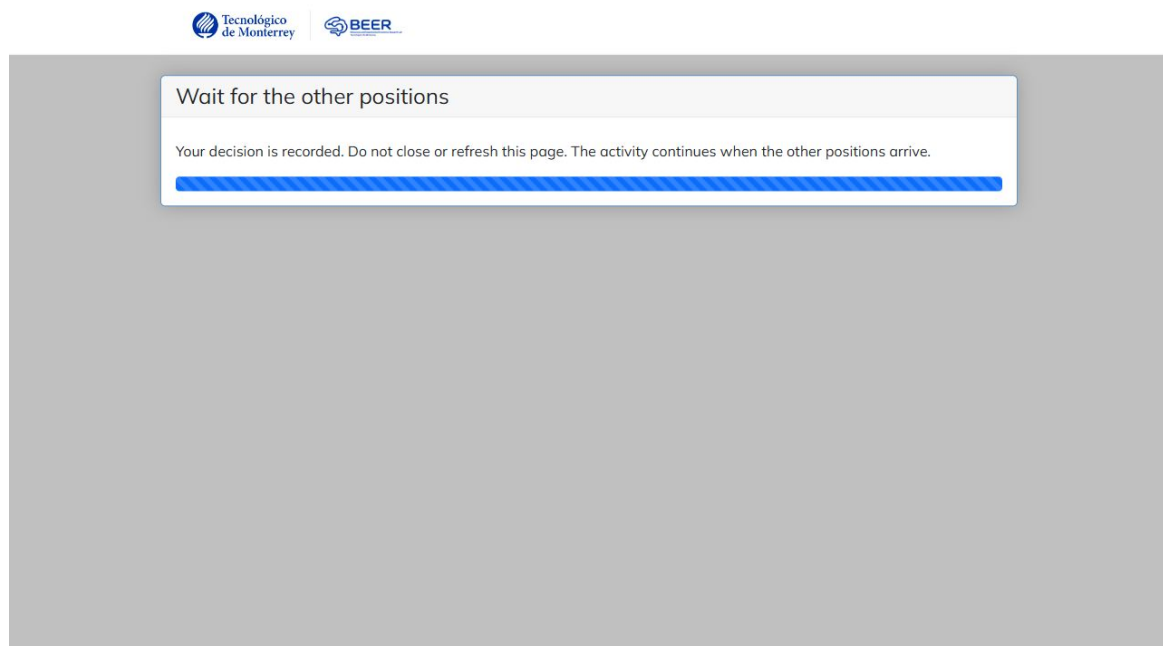


Figure 2.5: Group wait: recorded choices are preserved while the other positions arrive.



Figure 2.6: A's decision screen makes resources, the productive increase, and relevant probabilities visible before confirmation.

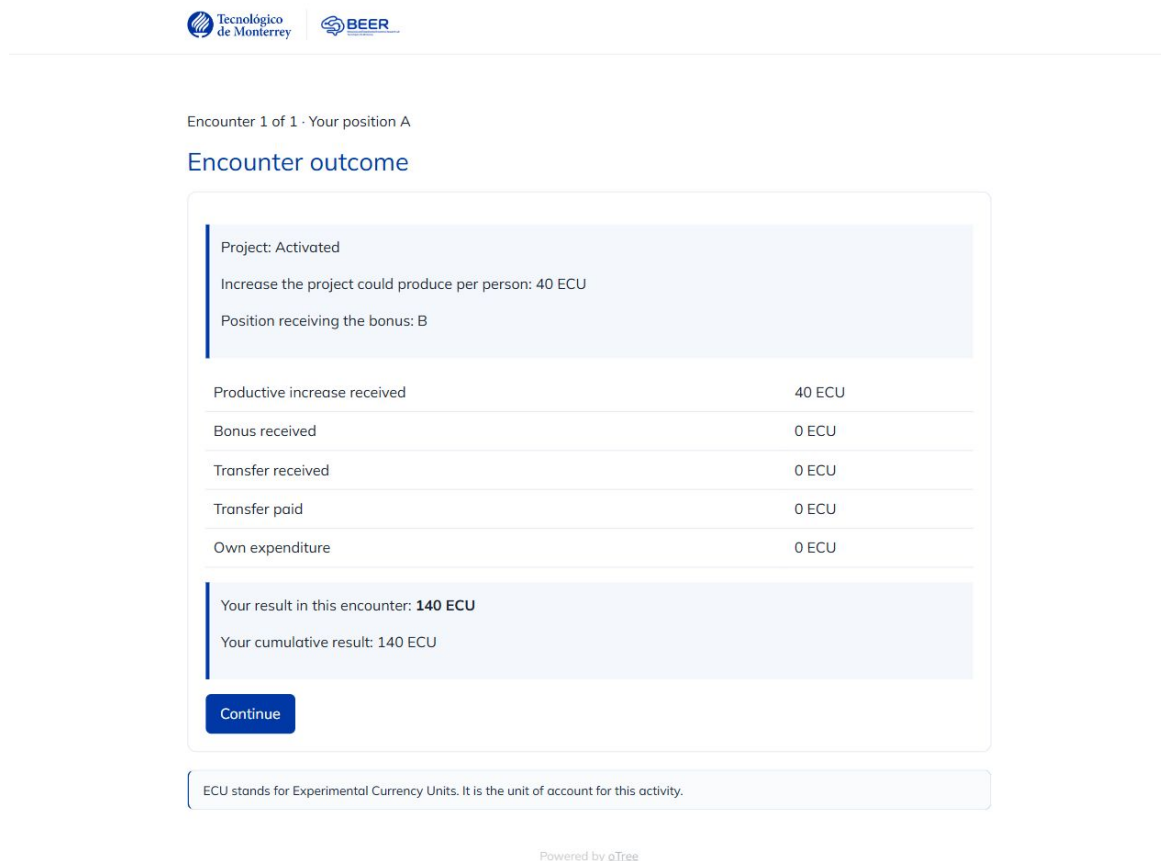


Figure 2.7: Own outcome: the realized bonus and productive increase appear as separate components.

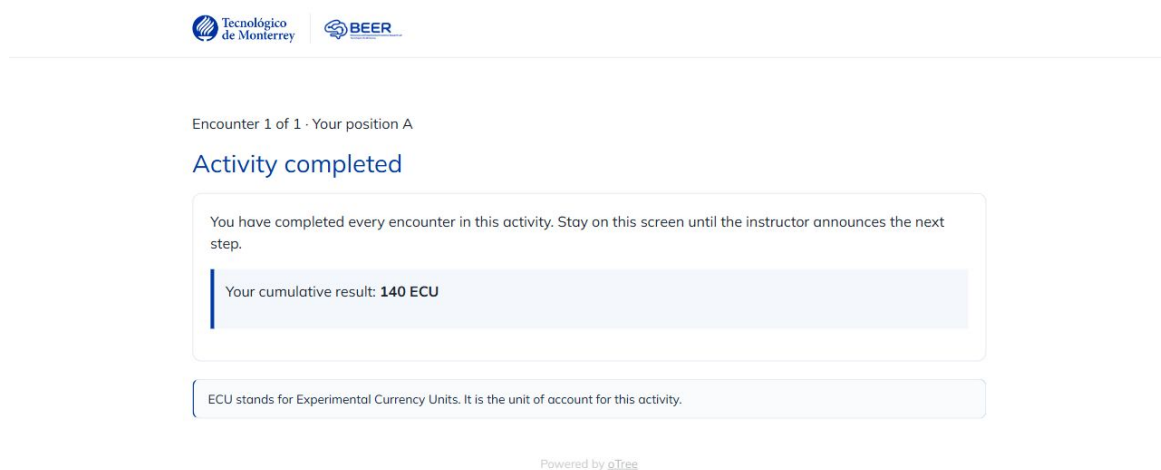


Figure 2.8: One-encounter completion: cumulative result and an explicit end to the activity.

game therefore represents a series of decisions under one mechanism rather than a complete simulation of governments succeeding one another, accumulating wealth, or changing institutional rules. Such processes would require additional states and decisions that are deliberately outside this family's content boundary.

A fixed group preserves the same people, allowing shared experience and expectations about their behavior. Random reassignment preserves positions while changing group composition, with repeated counterparts possible. Both formats use the same accounting in each encounter. An adoption change across rounds may reflect learning, draw experiences, social preferences, or payment expectations. The report shows descriptive evolution but cannot automatically distinguish these mechanisms. Use the contrast to ask what is observed and what additional measurements would be needed to explain it, rather than treating repetition itself as an identified test of one specific behavioral theory.

Institutional comparisons and information

3.1 Organizing the nine conditions

The extended edition contains a benchmark and eight conditions changing specific mechanisms. The benchmark preserves the 40 ECU productive gain, 100 ECU bonus, and probabilities 0.9 and 0.2. It is not a new institution; it supplies a one-encounter comparison for other configurations. Protected continuity changes only the probability with activation. Office-value conditions change only the bonus. Guarantee and promise conditions add C's choices under the same transfer limit. Competition adds B's expenditure. The two uncertainty conditions share one productive distribution and differ in the clue available to A.

Before comparing conditions, write a prediction conditional on expected income. Then identify an observation consistent with it and another insufficient to establish it. For example, higher adoption under a smaller bonus would be compatible with a lower expected rent loss. Higher realized income for A does not establish that mechanism because it also depends on the draw. This practice distinguishes the intervention, recorded behavior, and theoretical explanation. Do not turn a classroom comparison into a causal estimate without an appropriate design, sample size, and treatment assignment supporting such an interpretation.

3.2 Politically protected continuity

In the safe condition, A's probability with activation increases from 0.2 to 0.8, while its probability without activation remains 0.9. Productive gains and the bonus are unchanged. A's expected income with activation becomes $100 + 0.8(100) + 40 = 220$, compared with 190 without it. Activation has an advantage of 30. The comparison isolates a small replacement threat: innovation still lowers A's probability somewhat, but the expected rent loss of 10 is smaller than the productive gain of 40. There is no need to remove all political risk to reverse the reference incentive.

The monetary prediction switches from blocking to adoption. This does not imply that protecting an incumbent always improves welfare or constitute a universal recommendation to concentrate power. The exercise changes one probability while holding everything else fixed. Real political arrangements may also change accountability, corruption, legal protection, and the technology selected. Use this condition to teach the term $(p_0 - p_1)R$, rather than attributing every such consequence to a single institution. Aggregate resources after activation remain 520, exactly as in the benchmark, so observed production differences arise through the adoption decision rather than a better technology.

3.3 Low and high value of office

The low bonus is 40 ECU. Without activation, A obtains $100 + 0.9(40) = 136$ in expectation; with activation, $140 + 0.2(40) = 148$. The difference of 12 favors adoption. Although the retention probability falls as much as in the benchmark, the rent at risk is smaller. B and C also receive the productive increase. Totals are 340 without the project and 460 with it. Comparing income levels across bonus conditions requires recognizing that external resources differ; the within-condition productive difference still equals 120. This distinction prevents a lower office bonus from being misclassified as lower technological productivity.

With the high bonus of 140, A obtains 226 without activation and 168 with it. The difference is $40 - 0.7(140) = -58$, strengthening the monetary blocking incentive. Production itself has not become less rewarding: each person still receives 40 if the project is implemented. Instead, the position A fears losing is more valuable. Compensation funded only by C, limited to 40, cannot cover the expected loss of 58. Even the maximum would leave A with 208 in expectation, below the 226 associated with keeping the initial situation. The constraint matters despite a positive aggregate technological gain.

This calculation separates sufficient joint surplus from one party's ability to finance a mutually acceptable agreement. B gains more from replacement and could participate in compensation under a different protocol. Here B has no transfer decision. C starts with an endowment of 100, but its own productive return is 40 and the compensation menu does not exceed that amount. Ask whether adding another financier would change the conclusion, while identifying that additional bargaining as an analytical exercise rather than an implemented decision in this family. More wealth in C's starting account would not itself increase C's productive return or willingness to pay under monetary self-interest.

3.4 Guaranteed conditional compensation

C announces an integer transfer between 0 and 40 ECU before A chooses. The amount is reserved from C's existing resources. Activation automatically delivers it to A; keeping the initial situation returns it fully to C. There is no external subsidy or later choice over the amount. A sees both the announcement and the rule. This sequence turns the announcement into an enforceable contingent transfer. It differs from delivering money irreversibly before learning whether the project will occur, because rejection does not leave those resources in A's account. The rejection outcome preserves the initial accounts and still allocates the fixed bonus.

With transfer t , A's expected difference is $-30 + t$. A transfer of 30 makes both options yield 190 in expectation for A. A transfer of 31 gives 191 with activation, exceeding expected income without activation by one. C obtains $140 - 31 = 109$, above its 100 without the project. B obtains 220 in expectation without financing the transfer. Total resources remain 520. All three positions improve in expectation relative to rejection with a transfer of 31, although an unfavorable draw can leave A below the result of a favorable draw without activation. Compensation addresses the expected incentive, not every comparison between possible realized lottery outcomes.

Checkpoint

With a guaranteed announcement of 31 and activation, the bonus awarded to B produces (171, 240, 109); the bonus awarded to A produces (271, 140, 109). Both totals equal 520. Rejection returns the reservation to C, creates no transfer, and leaves a total of 400. Do not add the deposit as another account: it belongs to C's existing resources.

Under monetary self-interest, a higher successful offer lowers C's income. The smallest amount securing adoption depends on how A handles indifference at 30. If A accepts when indifferent, 30 can suffice; otherwise, 31 is the smallest integer offer guaranteeing a strict preference under the monetary assumptions. Do not announce a unique equilibrium offer without specifying how indifference is resolved. The interface leaves that choice to the participant. The activity teaches a range of acceptable compensation, rather than manufacturing acceptance through a preselected option or an instruction telling A that equal expected income must lead to adoption.



Encounter 1 of 1 · Your position C

Announce a transfer

C announces between 0 and 40 ECU for A. The amount is reserved before A decides. If A activates the project it is automatically delivered to A. Otherwise it is fully returned to C. C makes no later payment choice. The transfer does not change total resources.

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

Amount announced for A (ECU)

Continue

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

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Figure 3.1: C announces a transfer backed by a conditional reservation.

3.5 Promises and subsequent voluntary payment

The promise condition preserves positions, probabilities, productive gains, and the 0–40 menu but changes execution. C first announces; A subsequently chooses; activation then allows C to choose the actual transfer. The announcement does not restrict that last choice. Without activation, the encounter ends without a transfer and C receives no artificial payment form. Credibility can therefore be compared without changing the productive benefit or adding a discount. The commitment problem comes from decision order and the ability to revise payment after the project has already occurred, not from an exogenously imposed inefficiency penalty.

Once activation has occurred, C receives the productive gain of 40 regardless of the transfer. Under monetary self-interest, choosing zero maximizes C's own income. A anticipating that choice again compares 160 with 190 and prefers blocking. Backward induction first identifies C's terminal choice and then A's earlier decision. Announcing 31 does not by itself generate the guaranteed condition's expected income of 191 for A. It would do so only if A actually expected to receive that amount. Such an expectation must remain distinct from an obligation implemented by the system or from knowledge of what C will choose later.

Positive transfers, activation without guarantees, and fulfilled announcements may occur. They are useful observations for discussion of reciprocity, distributive preferences, social reputation, or understanding. They do not establish legal enforceability or show that commitment problems have disappeared. The report calculates payment minus announcement only for activated projects, because only those encounters include C's later decision. If a group blocks, the instructor does not



Encounter 1 of 1 - Your position A

Decide about the project

A decides about the project. The bonus may be allocated to A or B. You remain in position A throughout the session, even when B receives the bonus.

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

A chooses to activate the project or keep the initial situation. Activation adds 40 ECU to each of the three accounts. Keeping the initial situation adds none of that increase.

At the end a single bonus of 100 ECU is assigned to A or B. It is a fixed additional resource financed by the activity, with or without the project. C receives no bonus. The draw does not deduct the bonus from anyone's account.

Probability that A receives the bonus: 90% without the project and 20% with it. B receives the bonus otherwise. A single draw occurs after decisions; it does not decide who can act in the next encounter.

Amount announced by C for A: **31 ECU**

Reserved amount: 31 ECU

C announces between 0 and 40 ECU for A. The amount is reserved before A decides. If A activates the project it is automatically delivered to A. Otherwise it is fully returned to C. C makes no later payment choice. The transfer does not change total resources.

Choose an option

Continue

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

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Figure 3.2: A observes the announcement and reservation before deciding.

know what C would have paid in an unplayed stage. Calling that case an unfulfilled promise would confuse a recorded decision with a counterfactual the activity has not elicited. A zero payment after activation is a genuine observation; an absent payment choice after blocking is not.




Encounter 1 of 1 · Your position C

Choose the actual transfer

Amount announced by C for A: 31 ECU

C announces between 0 and 40 ECU for A. The announcement does not bind C. If A activates the project, C later chooses delivery between 0 and 40 ECU, including zero. Without activation there is no transfer or later payment choice.

Amount to deliver to A (ECU)

0

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

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Figure 3.3: After activation, C can choose a transfer different from the announcement, including zero.

Attention

A guarantee and a promise can produce identical payments in some groups while preserving different incentives. Compare the execution rule and sequence as well as transfer averages. A deposit returned on rejection, an irreversible advance, and a voluntary subsequent transfer have different rejection alternatives.

3.6 Chosen competition and its cost

Under competition, B first chooses expenditure e of 0, 10, 20, 30, or 40 ECU. It is deducted from B's endowment regardless of A's project choice and the bonus draw. A's probabilities become $p_0(e) = \max\{0, 0.9 - 0.015e\}$ and $p_1(e) = \max\{0, 0.2 - 0.015e\}$. A observes expenditure before deciding. This is an explicit classroom technology: each ECU lowers both probabilities by 1.5 percentage points and a floor prevents negative probabilities. It is not an estimate of how real political expenditure affects elections, and the expenditure is a decision within this treatment rather than a characteristic inferred from the authority's behavior.

e	$p_0(e)$	$p_1(e)$	Δ_A
0	0.90	0.20	-30
10	0.75	0.05	-30
20	0.60	0	-20
30	0.45	0	-5
40	0.30	0	10

Small expenditures reduce A's probabilities in both states equally, initially preserving the expected office loss of 70 from activation. Once the activation probability reaches zero, additional expenditure reduces only A's advantage without the project. At 40, A receives 130 without activation and 140 with it, so activation increases expected income. This illustrates why the difference between probabilities matters more than either probability in isolation. It also introduces a cost capable of altering the adoption incentive without directly improving the productive technology or the increment delivered to any participant account.

If B anticipates A's monetary responses, expected results with expenditure 0, 10, 20, and 30 are 110, 115, 120, and 125 when A blocks. With expenditure 40 and activation, B receives $100 + 40 + 100 - 40 = 200$. In this schedule, B chooses 40 and A activates. Realized joint resources total $520 - 40 = 480$, compared with 400 without expenditure or activation. Unlocking creates production but uses 40 to compete. The positive relationship between that expenditure and adoption under these parameters does not establish that more competition always creates more innovation in other models, nor that expenditure itself is productive investment.



Encounter 1 of 1 - Your position B

Choose an expenditure

B chooses expenditure between 0 and 40 ECU in multiples of ten. Each ECU lowers A's probability by 1.50 percentage points in both situations, with a zero floor. A observes expenditure before deciding. The cost is paid even without activation.

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

Expenditure chosen by B	A - Keep the initial situation	A - Activate the project
0 ECU	90%	20%
10 ECU	75%	5.00%
20 ECU	60.00%	0%
30 ECU	45.00%	0%
40 ECU	30.00%	0%

B's own expenditure (ECU)

40 ECU ▾

Continue

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

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Figure 3.4: B chooses expenditure while observing its cost and the resulting probabilities.

3.7 Uncertain technology without a signal

Both uncertainty conditions replace the certain gain of 40 with a gain of either 20 or 100 ECU for every person, with equal probabilities. The state is drawn before the choice and disclosed with the outcome, including without activation. The bonus remains 100 and probabilities remain 0.9 and 0.2. The expected productive increment is 60, making an uninformed A compare 190 without activation with $100 + 60 + 20 = 180$ under activation. The difference of -10 favors blocking under

monetary self-interest and risk neutrality, even though the expected productive return exceeds that of the deterministic benchmark.

Productive returns are positive in both states: the project cannot reduce production in any account. A's private return can nevertheless be negative because of the office rent. The joint increment would be 60 in the low state and 300 in the high state; its prior expectation is 180. The report records the disclosed state and computes the corresponding potential increase not realized. It should not describe 180 as a loss observed in every group. That number is a prior expectation, whereas 60 or 300 are revealed potential outcomes. Making the state observable at the end is a design choice that supports classroom discussion of counterfactual production without pretending to measure participant beliefs.

3.8 Private signals and selective adoption

In the other uncertainty condition, only A receives a high or low clue matching the state in 80% of cases. Prior probabilities remain equal. After a high clue, the posterior probability of the high increment is $0.5(0.8)/[0.5(0.8) + 0.5(0.2)] = 0.8$, giving an expected increment of $0.8(100) + 0.2(20) = 84$. After a low clue, the posterior probability is 0.2 and expected increment is 36. Information changes the conditional assessment, not the real state or bonus probabilities. In particular, a high clue is not a promise of a high realized productive gain.

After a high clue, A compares 204 with 190 and prefers activation; after a low clue, A compares 156 with 190 and prefers blocking. B and C know the information rule but cannot see the clue before A chooses. Activation may reveal information about the clue if A is assumed to follow the monetary strategy. It does not prove which clue a particular person received without those assumptions. The later outcome reveals the state and makes errors in an imperfect clue observable: a high clue can accompany a real increment of 20, and that does not mean the state was redrawn after the decision.

The appropriate information comparison is between the two uncertainty conditions, which preserve states, probabilities, and the bonus. Comparing the signal treatment only with the certain gain of 40 would mix information and average return. Under monetary reference behavior, half the clues are high and selective adoption creates an average additional $0.5(3 \cdot 84) = 126$ ECU per encounter. Always adopting would create 180 on average. Information can improve A's private choice and increase production relative to always blocking while still failing to produce socially efficient adoption in every state. This comparison links information value, selection into adoption, and aggregate outcomes without treating higher observed quality among activated projects as a technological improvement.



Encounter 1 of 1 - Your position A

Prepare your decision

A decides about the project. The bonus may be allocated to A or B. You remain in position A throughout the session, even when B receives the bonus.

Each position A, B and C starts every encounter with 100 ECU. The group's initial accounts total 300 ECU and renew each encounter.

Probability that A receives the bonus: 90% without the project and 20% with it. B receives the bonus otherwise. A single draw occurs after decisions; it does not decide who can act in the next encounter.

One group of three for one encounter.

Your private clue: **Low**

Given your clue, the probability of a high increase is 20.00% and the expected increase is 36 ECU per person.

[Continue](#)

ECU stands for Experimental Currency Units. It is the unit of account for this activity.

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Figure 3.5: Only A observes the clue before deciding, together with its probability interpretation.

Instructor report, data, and interpretation

4.1 Reveal outcomes after stating predictions

The private report begins with results hidden. The instructor can see participants, completed group-encounters, and pending group-encounters. This information supports session management without projecting averages or distributions that could influence ongoing choices. The reveal button opens aggregate results for the selected session. Hiding closes that block again without deleting responses or restarting draws. The instructor's browser preserves the reveal choice while consulting the session. This control concerns classroom presentation of data, while authentication separately controls access to the private report and instructor download.

Before revealing, invite students to calculate the sign of A's expected activation difference and the joint productive gain. In a guarantee–promise comparison, also ask who controls the final payment. Discussion is more useful when students state a prediction before learning what happened. Afterwards separate two tasks: checking resource accounting and explaining behavior. The first can be resolved using the game's identities; the second requires assumptions about objectives and expectations that the report does not directly measure. A consistent balance sheet therefore does not by itself establish why a particular authority chose activation or why a citizen later paid a positive amount.

4.2 Participants, groups, and encounters

The participant count records people connected to the session. Adoption decisions belong to group-encounters: one authority chooses for each group in each encounter. Six people make two groups and generate two project choices in a single encounter. If those six play ten encounters, there are twenty adoption observations but still six people. Observations within a fixed group are not independent; reassignment also preserves people and positions. Do not multiply the adoption sample by three simply because one choice affects three accounts. The distinction matters when reading both descriptive proportions and possible future research analyses.

A group-encounter is complete when every required decision has been recorded, the bonus allocated, and income calculated. Sending an announcement or choosing activation is insufficient if C's voluntary payment remains pending. A session can consequently show recorded announcements alongside pending encounters. The report does not classify those pending cases as blocking. Its adoption fraction uses completed encounters only. In an empty session, read the absence of observations rather than interpreting a displayed zero as an adoption rate based on students who have not yet reached the project choice. Progress and outcome denominators serve different

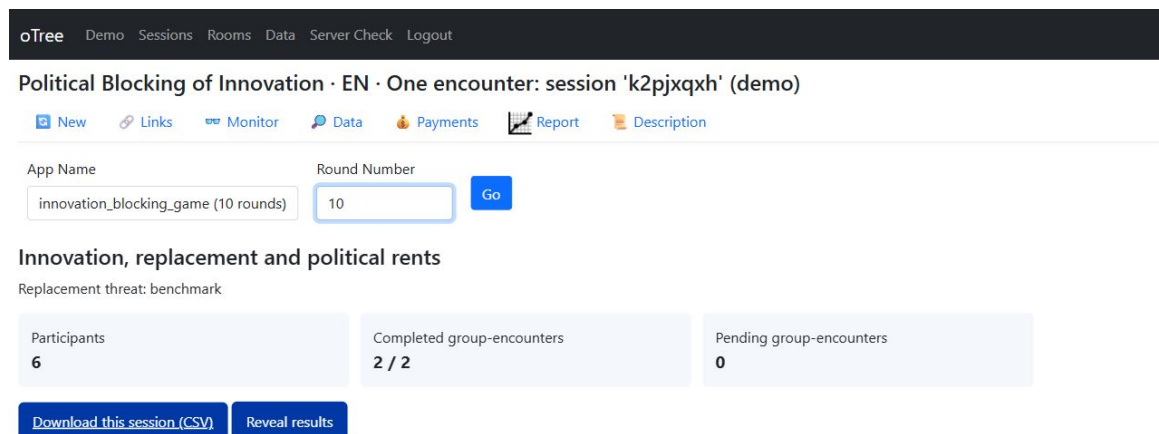


Figure 4.1: Private report with outcomes hidden. Progress and selected-session download are available before aggregate results are revealed.



Figure 4.2: English demonstration report: one activation and one block, with realized and unrealized productive increases separated.

purposes.

The administrator may open the report at technical period ten even when a configuration has only one active encounter. Aggregates explicitly traverse the session's active encounters, so that view must show the first encounter's data. The distinction prevents an apparently empty report from being mistaken for lost responses. The native wide file also contains unplayed technical-period columns. Keep those columns when documenting system structure, but exclude them from an analysis of active decisions and results. Technical capacity for ten encounters is not evidence that a one-encounter session actually exposed participants to ten repeated interactions.

4.3 Adoption, production, and opportunity cost

The decision distribution shows how many groups activated the project and how many kept the initial situation. Bars display counts and the denominator, making clear that one half has a different evidentiary weight with two groups than with twenty. Realized productive increase sums three times the increase in each activated project. Each benchmark activation contributes 120. The indicator excludes endowments, bonuses, and transfers, connecting it directly to new production authorized by A's choice. This separation also prevents office allocation from being counted as an efficiency gain merely because its recipient changed.

Potential increase not realized sums three times the productive capacity of complete projects that were not activated. Each benchmark block contributes 120; under uncertainty it can contribute 60 or 300 depending on the disclosed state. This is an opportunity cost inside the exercise, not a fine deducted from anyone's account or an estimate of production in a real economy. It can be calculated here because the design determines and discloses the state even without activation. It does not require assumptions about what participants believed beforehand. Its interpretation should therefore remain tied to the experimental technology and the disclosure rule.

Feedback script

Start with four questions: how many groups finished, how many projects were activated, what additional production appeared, and what potential production was left unrealized? Then ask which position controlled the decision and what expected rent loss it faced. Finish by distinguishing a joint improvement from an individual improvement and a prior expectation from an observed outcome.

Under competition, realized productive increase does not deduct B's expenditure because it measures production rather than net resources. To obtain the net gain relative to an initial situation without expenditure, subtract the corresponding competition cost. A group activating with expenditure 40 creates 120 and uses 40, leaving a net gain of 80 and a total of 480. A group blocking after spending 10 finishes with 390, even though its additional productive income is zero. Role-specific accounting and the exporter identify both operations without confusing expenditure with a transfer delivered to the authority or with investment that raises the project's productive capacity.

4.4 Role outcomes and expected references

The role table distinguishes A, B, and C using consistent letters and colors. Each row reports complete observations and mean outcome, productive increase, bonus, and expenditure. Summing the three mean outcomes gives mean total resources per group when every row uses the same completed groups. A's mean bonus and B's mean bonus must sum to the bonus value of the

configuration; C receives zero. Small sessions can show realized averages very different from expected values precisely because allocation uses a draw. Check that accounting identity before proposing a behavioral explanation for differences across roles.

A's expected difference uses information available to A and probabilities applying to each encounter. It includes assured compensation under guarantees, but does not treat a voluntary announcement as obligatory income under promises. Under competition it uses probabilities produced by expenditure. With a private clue it uses the conditional expected increment. This is a monetary reference calculated from rules, not an elicitation of A's beliefs. A participant can choose using other beliefs, and the report does not identify that mental difference from the recorded option. Its label explicitly excludes voluntary promises so instructors do not mistake a nonbinding announcement for an enforced transfer.

Distribution of decisions

Observations: 2



Mean results by position

Your position	Observations	Your result in this encounter	Productive increase received	Bonus received	Own expenditure
A	2	170	20	50	0
B	2	170	20	50	0
C	2	120	20	0	0

Evolution by encounter

Encounter	Observations	Activated	Realized productive increase	Potential increase not realized
1	2	1	120	120

Results use completed group-encounters in active periods. A group with pending decisions is not counted as blocking. Recorded announcements may precede complete outcomes. Transfers and gaps use activated projects only. The bonus redistributes a fixed amount between A and B; it is not extra production from activation. Potential increase not realized is known because the state is revealed even without activation; it does not measure beliefs.

Figure 4.3: Decision distributions and role outcomes. Interpret realized income together with the bonus allocation.

4.5 Announcements, payments, and absent stages

In compensation conditions, mean announcements use actual recorded announcements, even when some encounters remain pending. Mean payments and payment-announcement gaps use complete activated projects. Under guarantees the gap is zero by execution of the rule, rather than evidence that participants were more honest. Under promises a negative gap describes delivery below the announcement after activation. Discuss decision order and the payment menu before attributing a personal motivation to C. The report preserves separate denominators, allowing an instructor to see when announcement observations outnumber completed opportunities to deliver a transfer.

The exporter distinguishes executed transfers from payment choices. A guarantee automatically delivers its amount without a later choice by C. A blocked project executes transfer zero but also has no later payment choice. Only an activated promise contains C's actual decision, where zero is a valid response. Keeping that field separate allows opportunities to choose to be counted without turning an absent stage into a recorded answer. The same discipline applies to B's expenditure: outside competition, accounting cost is zero while the expenditure-choice field remains empty because no such choice was requested. This preserves both correct payoff accounting and correct behavioral interpretation.

4.6 Information and temporal evolution

Uncertainty conditions include an activation table by A's information: high clue, low clue, or no clue. Each row displays completed observations and activated projects. The monetary prediction implies more activation following high clues, but a small sample may exhibit another pattern. Clues are imperfect, so an activated project following a high clue can have a low realized return. Do not automatically label that decision a calculation error. Evaluate it with A's information when choosing, rather than with the state subsequently disclosed to everyone. Comparing choices with realized quality without conditioning on available information would introduce hindsight into the assessment.

The evolution table reports encounter, completed observations, activations, realized production, and unrealized potential production. Use it to locate a pattern change without interpreting every fluctuation as learning. With two groups, moving from zero to one activation changes the proportion by fifty percentage points. The known horizon, draw experiences, and group composition can matter. A fixed-random comparison should preserve resources, bonus, probabilities, and group count. If a class cannot maintain those controls, present it as an illustration rather than a test isolating one mechanism. Repeated observations remain linked to the same participants even when counterparts change.

4.7 CSV structure and privacy

The download button requests only the session currently displayed. The native file is wide: one row per participant with columns for ten technical periods, including pending fields. The custom file is long: one row per participant and active encounter. They serve complementary purposes. The wide file supports reviewing a person's history, while the long file supports grouping by encounter and position. Preserve an original copy before reorganizing columns, and record language, treatment, format, and horizon when preparing a discussion table or research dataset. A successful download is not sufficient unless its session code and number of participants also match the intended session.

Group variables repeat in all three members' rows in the long format. To count adoptions and add joint productive gains, use one row per group-encounter, for example position A. To compare role income, use individual rows. Adding a group-level increment across all three rows would triple production. Participant identifiers help connect encounters but must not be projected in class or linked to names, student numbers, or seats. The aggregate report omits those identifiers. Instructor downloads require private access and should be stored according to the activity's data rules, rather than distributed as ordinary participant material.

Attention

An empty cell can mean a pending choice, an inapplicable stage, or an inactive period. Do not automatically replace it with zero. Use completion status, the project choice, and treatment to interpret it. The codebook explains each case, distinguishing no response from an actual payment choice of zero.

Classroom use, exercises, and scope of evidence

5.1 A forty-five-minute introductory class

Use the first five minutes to present a choice about a project and explain private participant links. Do not yet describe the blocking prediction. Spend five to ten minutes on instructions and comprehension, allowing mistakes to be corrected. Use approximately five minutes for the basic encounter. If someone remains waiting, first check connection and arrival of other positions without suggesting which option A should select. Keep the report hidden until all required choices are complete and everyone has seen their own outcome. This sequence preserves decisions made under the announced mechanism rather than under knowledge of classmates' choices.

During the next ten minutes, ask students to reconstruct aggregate accounts and A's two expected incomes. Pair discussion can occur outside the experimental session after choices are complete. Then reveal the report and describe what happened using its denominators. Reserve another ten minutes for a comparison such as protected continuity or a smaller bonus. Use the last five for a short written answer: why can a social gain coexist with private blocking, and which assumption changed in the comparison? The class then ends with a mechanism explanation, rather than only the excitement of winning or losing the bonus draw.

What participants will see

Students see accounts, positions, probabilities, and options. During the game they do not need the theory's name or the article inspiring its mechanism. Discussion can reconstruct those concepts from choices and accounting. Distinguish the instructions necessary to act from the hypotheses subsequently used to interpret outcomes.

5.2 An advanced class on commitment and information

A sixty- to seventy-five-minute session can start with the benchmark and then compare guarantees with promises in separate groups. Before revealing results, students place stages along a timeline: announcement, project, payment where applicable, and draw. The central question is which choice each actor retains after the project has occurred. Students subsequently calculate the transfer making A indifferent and examine what changes when C can choose zero. This sequence connects political replacement to the problem of committing to future compensation, while preserving a concrete account of who decides what and when.

The final portion can introduce the uncertainty pair. Ask students to derive posterior probabilities

using natural frequencies: among fifty high states, forty yield a high clue; among fifty low states, ten also yield one. A high clue collects fifty cases, forty with the high state. This representation clarifies why eighty-percent accuracy does not mean certainty. Compare A's private choice with aggregate production and ask whether additional information fully resolves the divergence. The answer should note that a low clue still induces blocking even though productive increases remain positive in both states of the project.

Do not attempt every condition in one short class. The full package supports selecting comparisons for the course topic: power and growth, office rents, commitment, or informed decisions. Repeated formats can support a separate session on experience and expectations. Document who participated in each condition and what information they received beforehand. This distinguishes a planned comparison from an illustration selected after it produced a striking result. Both may teach, but they support different statements about behavior. An instructor's deliberate selection of examples should not subsequently be described as random treatment assignment or independent experimental evidence.

5.3 Exercise 1: reconstruct the budget

Suppose A activates the benchmark project and B receives the bonus. Determine productive income, office rent, individual results, and the total. Start with three endowments of 100. Everyone receives 40 of production and only B receives a bonus of 100. Outcomes are $A=140$, $B=240$, and $C=140$, totaling 520. The increase relative to the no-project total is 120. A calculation giving 620 probably counted two bonuses or treated the bonus as absent from the rejection alternative. Ask students to identify exactly which operation generated their incorrect extra resource.

As a follow-up, allocate the bonus to A while keeping activation unchanged. Outcomes become 240, 140, and 140. Total resources remain 520 and production remains 120. Explain why an income change between A and B is not evidence of changed productivity. The exercise requires identifying whether a changing variable concerns production, allocation, or both. That skill also applies to a report where realized average rents differ across small sessions, and it prevents a lucky draw for one authority from being interpreted as proof that its group's technology was more productive.

5.4 Exercise 2: the office-value threshold

With productive gain 40 and probability difference 0.7, find the bonus value making A indifferent without compensation. Solving $40 - 0.7R = 0$ gives $R = 40/0.7$, approximately 57.14. Below it, activation improves A's expected income; above it, activation lowers that income. Implemented bonuses of 40 and 100 lie on opposite sides of the threshold. The calculation shows how blocking depends on the interaction of the probability loss and value of the position at risk, rather than on a productive gain or political probability considered separately.

Next ask what happens if both probabilities increase by the same amount without changing their difference, while remaining valid. The sign of A's activation advantage remains unchanged. A may have a higher absolute probability of receiving the bonus, but the marginal loss associated with the project has not changed. This helps avoid an interpretation based solely on general political insecurity. It also recalls that probabilities must remain between zero and one. A transformation exceeding those bounds requires a different rule and cannot be analyzed as an unlimited linear shift of both retention probabilities.

5.5 Exercise 3: compensation improving everyone's expectation

Under the benchmark guarantee, C announces 35 and A activates. A obtains $160 + 35 = 195$ in expectation, B obtains 220, and C receives 105. Relative to 190, 110, and 100 without activation, the improvements are 5, 110, and 5. Total resources remain 520. An announcement of 40 leaves C with 100: it does not lose relative to rejection but also does not strictly improve. A larger transfer is outside the menu and, under the same productive increment, would reduce C's result below the initial alternative. The public cap and monetary willingness-to-pay therefore coincide at 40 in this benchmark.

Explain strict versus weak improvement. At 30, A is indifferent while C obtains 110; at 31, both strictly improve in expectation; at 40, C is indifferent. Thus transfers from 30 to 40 avoid making either A or C worse off, while integer transfers from 31 to 39 strictly improve both. The comparison uses expectations for A because its bonus is uncertain and a certain amount for C because C does not enter that allocation. It does not imply that every realized outcome with adoption dominates every realized rejection outcome for A.

5.6 Exercise 4: rejection under guarantees and promises

C announces 31 but A does not activate. Under the guarantee, reserved resources are returned and no final transfer occurs. Under the promise, there is also no payment, for a different reason: the voluntary payment stage is never reached. Both cases preserve initial accounts plus the bonus. If A receives the bonus, outcomes are 200, 100, and 100. Identical observed rejection outcomes do not establish identical incentives regarding possible activation. The relevant distinction concerns what would be enforceable after the project occurred, rather than a payment created by rejection.

Now compare activation. The guarantee automatically delivers 31 while the promise allows C to select another number, including zero. Ask what data are needed to measure fulfillment. The answer includes the announcement, project choice, and actual payment, restricted to cases with a later opportunity to pay. An empty payment-choice cell under a guarantee is correct because no such decision existed. A recorded zero after an activated promise is an observed behavior that does enter the gap calculation. Students should distinguish the transfer executed by accounting from the existence of a discretionary choice over that transfer.

5.7 Exercise 5: competition and net resources

B chooses competition expenditure 40. A's probabilities are 0.3 without activation and zero with it. A compares 130 with 140 and activates under monetary self-interest. B receives 200, C receives 140, and A receives 140, giving a total of 480. Productive gain is 120 and expenditure uses 40, so the net gain relative to no expenditure and no activation is 80. Describing the 40 as a transfer enriching A would be incorrect because it disappears from participant accounts. Its benefit is a change in the project's adoption incentive, not a direct resource receipt by another role.

For comparison, B spends 30 and A blocks. A's no-project probability is 0.45, giving B expected income $100 + 0.55(100) - 30 = 125$. The group's realized total is 370 regardless of the bonus recipient. Expenditure altered expected allocation and consumed resources without generating technological gains. This illustrates why the mechanism's cost matters alongside adoption frequency. The solution depends on the particular classroom competition technology. A different effort cost or probability schedule could change both B's optimal expenditure and A's project decision, so this exercise should not be translated into a universal claim about political competition.

5.8 Exercise 6: an imperfect clue

In the signal condition A receives a high clue. Calculate expected income with activation and explain what happens if the real state is low. The posterior high-state probability is 0.8, giving an expected gain of 84 and expected A income $100 + 84 + 20 = 204$. Activation beats 190. If the state later turns out low and B receives the bonus, A receives only 120. That unfavorable realization is compatible with a choice maximizing expected value given available information. It is not evidence that the project was evaluated using the wrong probabilities or that the server changed its state after the choice.

Repeat for a low clue. The posterior probability of the high increment is 0.2 and expected gain is 36, so A expects 156 with activation and prefers 190 without it. If the real state is high, blocking leaves 300 of joint production unrealized. A bad informational realization does not show that A knew and ignored the state. Ask students to separate the clue record, known information rule, decision, and revealed state. Only this sequence evaluates the reference prediction at the appropriate point in time and distinguishes mistaken inference from an unlucky but correctly interpreted signal.

5.9 Exercise 7: build the correct rate

Consider six participants over ten encounters. The report currently contains fifteen complete group-encounters, nine activated, and five pending. Observed adoption is $9/15 = 60\%$, not $9/20$, which would classify unfinished encounters as blocks. It is also not $9/6$, which compares projects with people. In the certain benchmark, recorded additional production is $9(120) = 1080$; the six complete blocks represent $6(120) = 720$ of unrealized potential gain. The five pending encounters belong to neither outcome category yet. Their eventual completion can change both the numerator and denominator of the adoption rate.

The long CSV contains three member rows per active group-encounter. To count fifteen complete observations, select one position per group-encounter or deduplicate using the corresponding keys. To compare A, B, and C income, retain individual rows and group by role. This exercise integrates denominators, data structure, and economic meaning. It also distinguishes correct calculation from statistical inference: fifteen encounters do not mean fifteen independent authorities when the same people decided repeatedly. A properly calculated descriptive rate can still come from a small and dependent set of decision makers, limiting conclusions beyond the classroom.

5.10 Literature, evidence, and inference limits

[Acemoglu and Robinson \(2006\)](#) develops a mechanism in which replacement concerns can prevent productive and institutional changes. Political competition is not universally monotone in that framework. This activity draws on the mechanism and adapts its decisions and quantities for teaching. It neither literally reproduces the model nor presents its screens as an experiment from the article. Expenditure schedules, endowments, bonuses, and information conditions are explicit classroom-design choices. Identify them when connecting theory with the session's outcomes, rather than attributing every numerical prediction in this guide to the published model.

The distinction between feasible and enforceable compensation connects with [Acemoglu \(2003\)](#). For choices under risk, [Holt and Laury \(2002\)](#) supplies experimental evidence through lottery choices; its relevance here is that maximizing expected income requires a preference assumption. The investment game of [Berg et al. \(1995\)](#) studies trust and reciprocity and motivates questions about voluntary payments. None directly establishes how an authority will behave under this political protocol. Do not import another game's empirical frequency as an expected adoption

rate for this family. These references support interpretation and further reading while the actual activity remains an original adaptation with its own decision structure.

The activity does not measure risk aversion, distributive preferences, or subjective beliefs. Benchmark activation can be compatible with valuing others' income, alternative probability beliefs, or misunderstanding. A positive transfer can be compatible with reciprocity or other objectives. The report records options and outcomes but cannot choose among these explanations. Research on a mechanism would require appropriate measurements and treatments, assignment, and sample size, together with the laboratory's applicable ethical and operational procedures. A teaching session can formulate those questions without pretending that an unmeasured preference has already been identified from a single choice or a small treatment difference.

5.11 Common difficulties and conceptual closure

If a participant does not advance, first check for a legitimate wait and completion of other positions' instructions or choices. If a report appears empty, confirm session, treatment, and active periods. If a download has an unexpected participant count, check its session code before use. If an outcome is surprising, reconstruct endowment, production, bonus, transfer, and expenditure. Do not redraw or remove an observation because it contradicts a prediction. Technical checking and behavioral explanation are separate tasks, and keeping that distinction preserves the credibility of both the exercise and the subsequent classroom discussion.

Conceptual closure should connect decision authority, productive returns, and continuation of rents. Ask which institution changed A's alternative and whether it worked through a smaller threat, lower office value, enforceable payment, competition, or information. Then ask which cost and constraint remain. A guarantee can fund adoption within a limited budget; competition has a real cost; information can induce selection without eliminating every productive loss. Students should finish with a concrete account of why increasing available surplus and securing its realization are different economic problems, and which part of that distinction the observed session actually illustrated.

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