



Instructor guide to credit with adverse selection

Laboratory implementation, theoretical foundations,
experimental evidence, and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



Revised edition | October 2026

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

How to use this guide

This guide supports the preparation, implementation, and classroom discussion of the credit with adverse selection family 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

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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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Preparing an experience about credit and information

1.1 Economic question and learning objectives

For the instructor

Collect choices before teaching the acceptance threshold. First ask who applied and who obtained credit; then reveal project composition. An average loss without those denominators can obscure the central economic question.

A lender can charge more for credit yet expect to recover less. Changing the contract can also change who wants to accept it. This activity makes that proposition observable. One student offers finance, others know their projects' probabilities and decide whether to apply. When applications exceed available slots, a lottery allocates credit. Project income is then drawn and the program collects automatically. The instructor can reconstruct selection before discussing realized losses.

The objectives are to distinguish risk from expected productivity, understand limited liability, calculate participation by project class and separate credit demand from actual funding. A second set concerns interpreting collateral, risk signals and competition without assuming that every intervention improves access and welfare together. Students need only probability arithmetic; this guide develops the calculations for instructors without experimental experience. Experiment here means controlled rules and recorded decisions. A classroom demonstration does not automatically become a causal evaluation of an actual lending policy.

Each basic market contains one lender and two applicants. There is one high-probability project and one low-probability project, assigned randomly between applicants. Both generate the same expected income before financing: 144 ECU. The high probability is 90% and successful income is 160; the low probability is 50% and successful income is 288. Failure income is zero. Equal means allow attention to remain on income dispersion and contract structure, without attributing selection to differences in average productivity.

The lender does not observe private assignment. Applicants learn their own project before choosing. There is no effort decision, technology switch or voluntary repayment. An uncovered debt therefore describes insufficient collection resources, rather than dishonesty. State this distinction when explaining the rules and revisit it at closure. The instructor report displays types only in aggregates; an individual lender's screens do not disclose them. Decisions can differ from a risk-neutral prediction because participants value uncertain income differently, make mistakes, or learn through feedback. Those possibilities are teaching opportunities, rather than reasons to alter an outcome after observing it.

1.2 Summary and curricular scope

Purpose	Relate credit terms to applicant composition and collection.
Experimental unit	Interactive market with one lender and two applicants; two lenders under competition.
Participants	Multiples of three; multiples of four under competition.
Basic edition	One interaction; ten fixed-group rounds; ten rematched rounds.
Extended edition	Reference and seventeen extensions, six rounds per condition.
Decision	Open an offer and set repayment; choose one contract or no application; quota when applicable.
Payoff	Mean wealth across active rounds, with renewed resources.
Topics	adverse selection; credit contracts; collateral; credit rationing; asymmetric information; project risk.
JEL	C92, D82, G21.
Suggested duration	35–50 minutes for one interaction and discussion; 60–80 for an institutional comparison.

The family belongs to the finance collection. Its focus is a debt contract under private information before lending. The catalogue already contains a loanable-funds market about interest and inflation, an insurance market and a lemons market. Those activities support conceptual connections but do not replace collection limited by project income and collateral. This package preserves those families and their separate economic questions. The new comparison centers on which borrowers choose debt and what creditors can actually recover.

The three basic modes change available social history. A single interaction provides no prior experience. A fixed group retains people and roles but redraws project class each round. Rematching reorganizes markets while preserving roles; the same group may recur by chance. None creates a persistent reputation for type: private risk renews. Repetition allows learning about selection and revision of offers, rather than identification of a permanently safe borrower. Explain this renewal clearly when students ask whether they should remember another person's earlier outcome.

Extended conditions are not a compulsory ladder. Select a comparison that serves the course. For financial information, compare a common contract with an imperfect score. For banking, compare fixed capacity with a chosen quota. For credit policy, compare a subsidy with a principal guarantee while recording external cost. Avoid running seventeen variants in one class. The package supplies a repertoire; an individual lesson needs a bounded question and enough time to interpret its results. The suggested durations include explanation and feedback, rather than treating the time spent clicking as the whole activity.

1.3 Access and session preparation

Start at <https://beer-lab.org/en/>, follow the laboratory's teaching entry, and open <https://teaching.beer-lab.org/en/>. Locate the card by title or by credit, collateral and information topics. The card distinguishes Spanish, English and extended editions. At the family domain, <https://adversecredit.beer-lab.org/demo> contains configurations and <https://adversecredit.beer-lab.org/rooms> contains four rooms. Coordination must deploy the production site before these routes can be used with students.

The English basic room is https://adversecredit.beer-lab.org/room/adverse_credit_en; the Spanish room is https://adversecredit.beer-lab.org/room/credito_seleccion_es.

Extended rooms end in `adverse_credit_extended` and `credito_seleccion_extendido`. A room is a shared entry that distributes positions; an individual link belongs to one position only. The instructor panel and its report require administrative access. Keep those addresses separate from links projected for participants. Open the chosen language before creating a session, rather than translating an active Spanish session verbally.

Before class, choose language, edition and condition, then check actual attendance. Ordinary markets require multiples of three; competition requires multiples of four. A six-person demonstration creates two independent basic markets. Do not fill a group with fictitious people or expect the program to invent missing choices. If attendance leaves extra students, assign silent observation or change the count before session creation. The application validates incompatible sizes both in the form and on the server. This matters because each loan depends on real decisions by the market's other roles.

Check that Demo displays 42 configurations from this family and Rooms exactly four rooms. Each basic room offers three modes and initially selects a basic configuration in its own language; each extended room offers eighteen conditions. Create a fresh session, inspect instructions for both roles and open the report before distributing links. Progress should appear without revealed decision aggregates. Prepare a board with columns for offer, application, funding and collection. That sequence organizes feedback without teaching a preferred choice before decisions have been recorded.

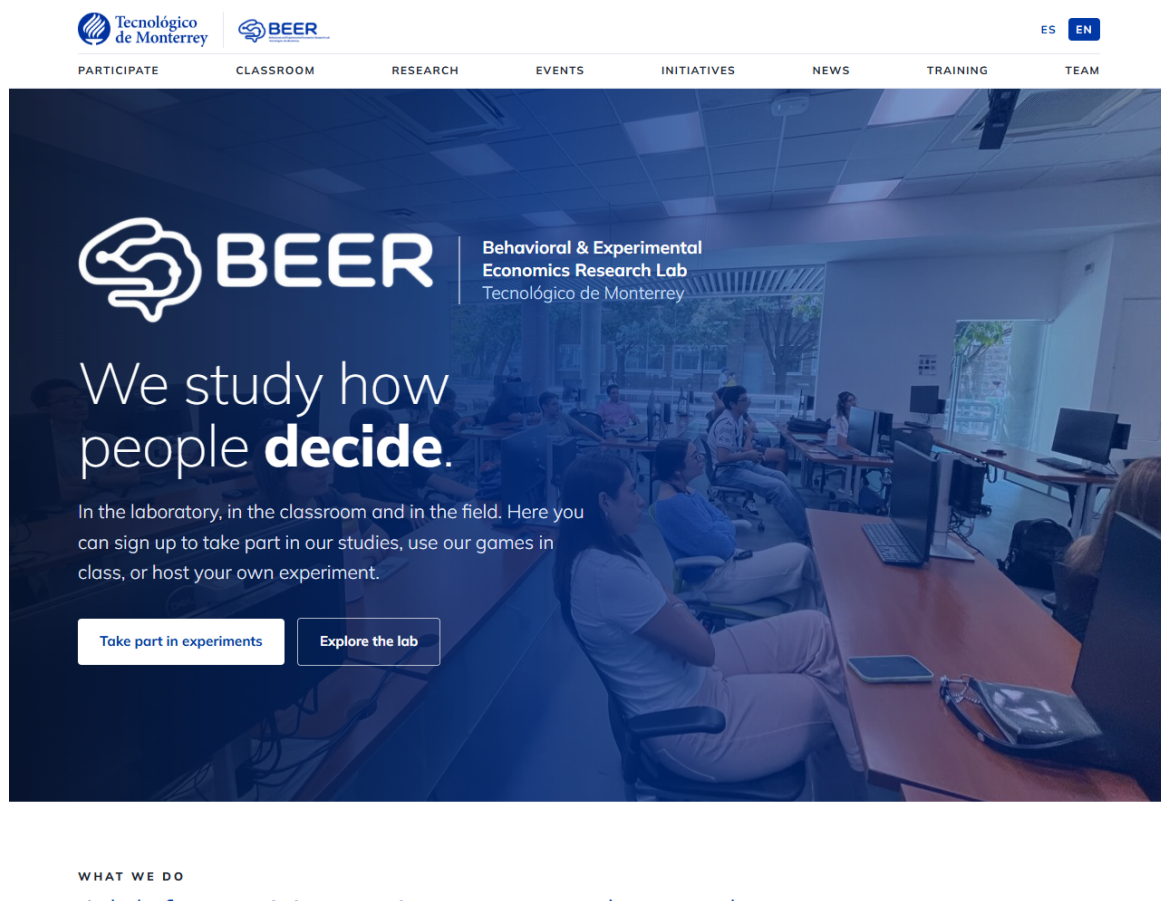


Figure 1.1: The CLASS entry leads to the teaching catalogue.

Search by title, topic, keyword or JEL code...

Topic ▾

JEL code ▾

144 games

Electoral Accountability and Political Selection

Study how the prospect of remaining in office changes an officeholder's behavior and how information allows voters to choose between politicians with different types. Basic: One encounter or four encounters with fixed or reassigned groups. Extended: Eight treatments on continuation, information, types, office value, term limits, and audits.

electoral discipline
political accountability
political selection

corruption
information
political economy

JEL A22 · C92 · D72 · D73

Address: accountability.beer-lab.org

Español

English

☐ Show extended version

Aggregate Demand and Aggregate Supply

Understand how spending choices aggregate into demand and how equilibrium with supply determines output and prices. Basic: One period, ten periods with the same economy, or ten periods with reassigned economies. Extended: Demand expansion and contraction, supply shock, fiscal stimulus, capacity, expectations, and coordination.

aggregate demand
aggregate supply
price level
potential output

macroeconomic expectations

JEL A22 · C92 · E12 · E31 · E32

Address: adas.beer-lab.org

Español

English

☐ Show extended version

Digital Advertising Auction

Study position auctions, cost per click, relevance, reserve thresholds, information, and strategic learning. Basic: One round, ten periods with a fixed market, and ten periods with reassigned markets under relevance-weighted GSP. Extended: Benchmark GSP, first price, ranking without relevance, high reserve, concentrated clicks, similar clicks, limited feedback, and one-position second price.

position auctions
digital advertising
cost per click
ad quality

market design

JEL A22 · C92 · D44 · L86 · M37

Address: [...](#)

Informative and Persuasive Advertising

Choose price and advertising against ten simulated consumers; compare awareness and valuation changes, increasing costs, profit, uncertainty, and welfare. Basic: One persuasive decision, one informative decision, or a two-decision comparison with low advertising costs. Extended: Five-decision learning, high advertising costs, alternative orders, cost changes, a five-ad limit, and costly production; each mechanism can be activated separately.

informative advertising
persuasive advertising
monopoly

marginal costs
welfare
learning

JEL A22 · C91 · D42 · D83 · L12 · M37

Figure 1.2: Search by title, topic or JEL; choose language and edition.

Demo

Crédito con selección adversa · Básica · Una interacción
Crédito con selección adversa · Básica · Diez rondas con grupo fijo
Crédito con selección adversa · Básica · Diez rondas con reasignación
Crédito con selección adversa · Extendida · Contrato común
Crédito con selección adversa · Extendida · Tipos públicos
Crédito con selección adversa · Extendida · Garantía de 20 ECU
Crédito con selección adversa · Extendida · Garantía de 40 ECU
Crédito con selección adversa · Extendida · Menú con y sin garantía
Crédito con selección adversa · Extendida · Señal con precisión de 80%
Crédito con selección adversa · Extendida · Señal con precisión de 60%
Crédito con selección adversa · Extendida · Dos prestamistas
Crédito con selección adversa · Extendida · Competencia con señal
Crédito con selección adversa · Extendida · Subsidio por préstamo
Crédito con selección adversa · Extendida · Cobertura de pérdidas de capital
Crédito con selección adversa · Extendida · Dos plazas de crédito
Crédito con selección adversa · Extendida · Cupo elegido por prestamista
Crédito con selección adversa · Extendida · Tope de repago de 130 ECU
Crédito con selección adversa · Extendida · Costo de financiación
Crédito con selección adversa · Extendida · Opción externa de 20 ECU
Crédito con selección adversa · Extendida · Menor patrimonio con garantía
Crédito con selección adversa · Extendida · Recuperación parcial de garantía

Figure 1.3: Demo shows this family only; first configuration section.

Crédito con selección adversa · Extendida · Recuperación parcial de garantía
Credit with adverse selection · Basic · One interaction
Credit with adverse selection · Basic · Ten fixed-group rounds
Credit with adverse selection · Basic · Ten rematched rounds
Credit with adverse selection · Extended · Common contract
Credit with adverse selection · Extended · Public types
Credit with adverse selection · Extended · 20 ECU collateral
Credit with adverse selection · Extended · 40 ECU collateral
Credit with adverse selection · Extended · Secured and unsecured menu
Credit with adverse selection · Extended · 80% accurate score
Credit with adverse selection · Extended · 60% accurate score
Credit with adverse selection · Extended · Two lenders
Credit with adverse selection · Extended · Competition with scores
Credit with adverse selection · Extended · Per-loan subsidy
Credit with adverse selection · Extended · Principal-loss guarantee
Credit with adverse selection · Extended · Two credit slots
Credit with adverse selection · Extended · Lender chooses capacity
Credit with adverse selection · Extended · 130 ECU repayment ceiling
Credit with adverse selection · Extended · Funding cost
Credit with adverse selection · Extended · 20 ECU outside option
Credit with adverse selection · Extended · Lower wealth with collateral
Credit with adverse selection · Extended · Partial collateral recovery

Figure 1.4: The same list continued: extensions share one application.

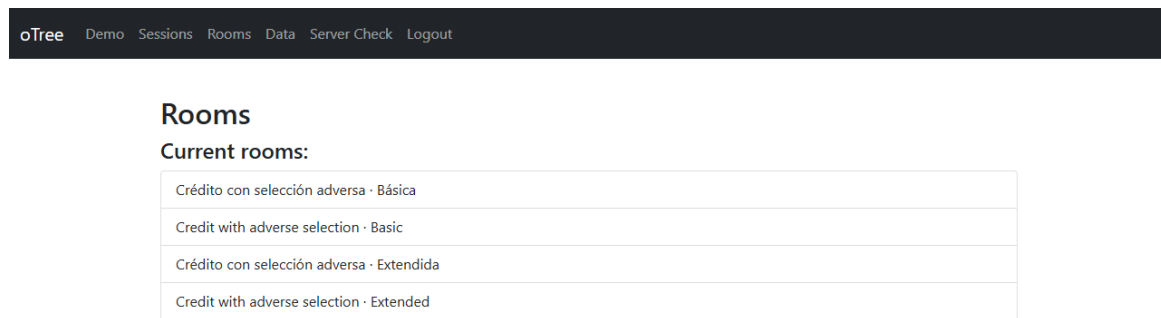


Figure 1.5: Four rooms separate languages and editions.

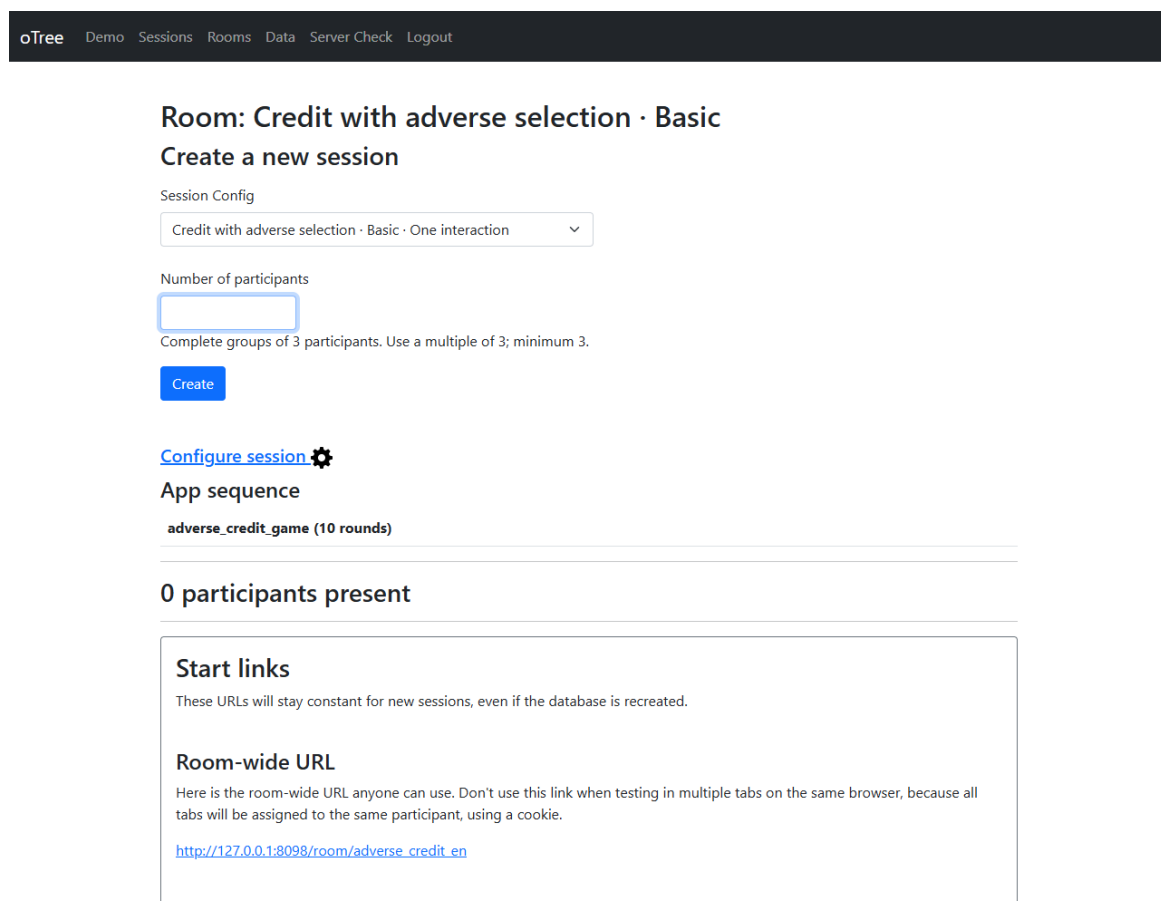


Figure 1.6: The basic room offers three modes in its language.

From debt contracts to applicant selection

2.1 Resources, debt and limited collection

What participants will see

The applicant's screen displays their own class, probability and successful income. Selecting an offer is an application: capacity can still prevent funding. Subsequent collection is not a decision; the program performs it using the announced rules.

ECU means Experimental Currency Units. It is the activity's accounting unit and implies no conversion to actual money. In the reference condition, the lender starts each round with 100 ECU and can fund one 100 ECU loan. Each applicant owns 40 of personal wealth and has alternative income of 9. Loan principal is invested directly; it is not extra cash that the applicant can retain alongside project income. Without a loan, final wealth is $40 + 9 = 49$. With a loan, alternative income is forgone and the applicant keeps the project's residual plus uncollected personal wealth.

Write L for principal, D for promised repayment, Y for realized income, W for wealth and C for collateral. Collection from income is $A = \min(D, Y)$. Wealth is then seized by $S = \min(C, \max(D - Y, 0))$. If collateral recovery is λ , the lender receives $R = A + \lambda S$. A funded applicant's wealth becomes $W - S + Y - A$. The program applies these operations in this order. It does not require the principal again after collecting D : principal is already included in the repayment promise.

The reference has $C = 0$, so $R = \min(D, Y)$. If a project produces 160 against debt of 130, the lender collects 130 and the applicant retains $40 + 160 - 130 = 70$. If that project fails, collection is zero and the applicant retains 40, but does not receive alternative income of 9. Limited liability protects unpledged wealth; it neither removes uncertainty nor turns acceptance into a guaranteed gain. A risk-averse student might prefer a certain 49 to a lottery with a larger expected value. The theoretical comparison below therefore states its preference assumption explicitly.

With collateral of 20, zero income and debt of 130, collection seizes 20 from wealth: 20 remain for the applicant and 20 go to the lender. With income of 160 and debt of 180, collateral of 40 permits collection of the missing 20 after project income is exhausted. Debt is covered even though income alone was insufficient. This distinguishes productive failure from uncovered debt. An otherwise successful project can leave debt uncovered if its promise exceeds available resources. Conversely, productive failure need not imply a principal loss for the lender when an external guarantee compensates it.

2.2 Acceptance and a worked selection example

Assume risk neutrality, no collateral and a probability p of producing y . When $D \leq y$, expected wealth with credit is $W + p(y - D)$. Without credit it is $W + u$, where u is alternative income. Accepting is weakly preferred when $p(y - D) \geq u$. The threshold is $D \leq y - u/p$. Personal wealth appears on both sides and cancels. That cancellation no longer fully describes participation when collateral is pledged or preferences depend on the distribution of wealth, rather than only its expectation.

For the high-probability project, $0.9(160 - D) \geq 9$, giving a maximum repayment of 150. For the low-probability project, $0.5(288 - D) \geq 9$, giving a maximum of 270. The form permits repayments from 100 to 180 in steps of ten. The second class therefore accepts the entire allowed range under these assumptions; the first leaves when the promise exceeds 150. At 150 it is indifferent. The reference table counts weak acceptance. Do not call rejection at that point a mistake, since acceptance and rejection have equal expected wealth.

Solve three offers on the board. With debt of 130, the high-probability class expects $40 + 0.9(30) = 67$; the low-probability class expects $40 + 0.5(158) = 119$. Both exceed 49. A fair one-slot lottery between two applications gives each a funding probability of one half. Expected wealth before rationing is therefore half of wealth with credit plus half of 49. This step matters: applying is distinct from receiving the loan. Nevertheless, the participation comparison keeps the same sign when allocation is independent of type and applying has no additional cost.

With debt of 150, expected wealth is 49 and 109 respectively. If both apply, either class receives the loan with probability one half. Expected collection is $(0.9 + 0.5)150/2 = 105$, giving lender profit of 5. At debt of 160, only the low-probability class remains. Expected collection falls to $0.5(160) = 80$, and profit becomes -20. Raising the promise by ten units reduced expected recovery by twenty-five because the applicant mix changed. The mechanism is visible even though the projects began with identical expected output.

Theoretical foundation

Recalculate collection using the types that would accept each contract. Multiplying every new repayment by the initial average success probability assumes away the question: that applicant composition remains unchanged when terms change.

2.3 Rationing, capacity and competition

An unfunded application measures unmet demand at the selected contract. In the reference, if both applicants accept and only one slot exists, the lottery leaves one unfunded. This is capacity rationing under the activity's rules. By itself, it does not demonstrate equilibrium rationing in a model with endogenous funding supply and bank entry. Stiglitz and Weiss motivate the selection effect; this finite adaptation makes that effect visible with bounded prices and known capacity (Stiglitz and Weiss, 1981). Keep that distinction when students ask whether the simulated market has established a theorem about all credit markets.

The lender can close an offer. It then retains capital and funds nobody. Repayment must still be entered, but a closed quote does not enter the distribution of open contracts. In the chosen-quota condition, a lender has capital for two loans and chooses zero, one or two slots. Zero is equivalent to closure. Allowing a quantity choice distinguishes an external constraint from a decision to retain funds. It still does not generate a general-equilibrium competitive supply curve, because entry, funding prices and the contract range remain specified by the teaching design.

Competition introduces two lenders and two applicants. Each lender has one slot and quotes simultaneously. Each applicant observes open offers and selects one or none. If both choose the same lender, one can remain without credit while the other lender has unused capacity. There is no second application or later reassignment. This stated friction supports discussion of coordination and access. It should not be described as an unnoticed algorithmic failure or interpreted as a continuous market with unlimited search and immediate reapplication.

Fixed groups retain people but do not retain assigned projects. The market always contains one project of each class; a private draw changes who holds each. The lender sees aggregate collections without a list identifying individual types. This prevents repetition from becoming a reputation study. When comparing fixed and rematched groups, discuss experience with the same group and learning about the rules, rather than inference about a person's permanent technology. Success draws can produce large swings in a small sample even when contractual offers are identical. The relevant expected comparison and the observed realization should therefore remain separate throughout feedback.

2.4 Collateral, recovery and external cost

Collateral changes two margins. It increases what a lender can recover when income is insufficient and reduces a contract's expected value to the person pledging wealth. If debt does not exceed successful income and collateral is seized only after failure, expected funded wealth is $W + p(y - D) - (1 - p)C$. Participation requires $p(y - D) - (1 - p)C \geq u$. Twenty units of collateral cost two in expectation for a project with 10% failure risk and ten for one with 50% failure risk. Collateral can therefore select applicants differently from an increase in promised repayment.

Compare two simultaneously offered contracts: debt of 150 without collateral and debt of 130 with collateral of 20. For the high-probability class, the first gives an expected residual of 9; the second gives $0.9(30) - 0.1(20) = 25$. For the low-probability class, the first gives 69 and the second gives $0.5(158) - 0.5(20) = 69$. This example does not strictly separate types: the second class is indifferent. Other parameters can create self-selection, but calling a form a menu does not establish a separating equilibrium. Check both participation and incentive constraints for each class and each available contract.

Partial recovery introduces a real loss. If forty units are seized from wealth but the lender receives twenty, the missing twenty are not transferred back to the applicant: liquidation destroys them. The report records this loss separately. By contrast, a ten-unit per-loan subsidy is a transfer from an external account. Private lender profit rises by ten. Evaluating joint welfare requires subtracting that same fiscal cost and accounting for any induced changes in investment and selection. Private profitability and social surplus therefore need separate accounting rather than a single ranking.

The 50% guarantee applies to unrecovered principal, $0.5 \max(L - R, 0)$, never to promised interest. With zero income and no pledged collateral, a hundred-unit loan receives fifty in support even if it promises repayment of one hundred eighty. The applicant still makes no repayment choice and does not receive that transfer. These extensions examine access and loss allocation, but cannot identify effort incentives because technology remains exogenous. Discussion can connect to Bester and Gale while stating that classroom parameter values are an original teaching adaptation (Bester, 1985; Gale, 1989).

Extensions and credit institutions

3.1 Choosing an interpretable contrast

The extended edition includes a reference and seventeen modifications. Every condition uses six fixed-group rounds and redraws projects. Parameter values are teaching adaptations of mechanisms from the literature, rather than literal reproductions of published experiments. Inflation is omitted because the catalogue has a dedicated family. Hidden effort and persistent reputation are also excluded: they belong to other debt designs and require different decisions or histories. Keeping those boundaries makes the interpretation of this family's results clearer.

Compare one institution with the reference before combining mechanisms. Hold language, decision time and verbal explanation constant. If assigning conditions across groups within one class, assign before observing results and respect the market as the interaction unit. Changes may affect offers and applications simultaneously. To understand a mechanism, follow contract, acceptance, funding and collection, rather than attributing every variation in profit to a single margin. A useful report comparison records the denominator at each stage as well as the final monetary outcome.

3.2 Public types

The lender observes that one project belongs to each class and sets repayment separately by class. Each applicant sees only the offer applicable to their project. Capacity and the funding lottery do not change. This removes hidden type but also permits differentiated contracts; it is not merely an informative label combined with a compulsory common price. Under risk neutrality, the lender can seek sufficient recovery from each class without the same endogenous pooling problem. Examine open quotes, applications and credit by class. If access improves, ask how much follows from changed terms and how much from composition. The prediction requires neither universal acceptance nor higher realized profits in every round. The motivating concept is private information in debt contracts ([Stiglitz and Weiss, 1981](#)).

3.3 Twenty-unit collateral

Each contract pledges 20 ECU out of 40 in personal wealth. Project income is collected first; only a remaining shortfall activates collateral. The class with lower success probability faces a larger expected wealth loss, so collateral changes participation as well as creditor protection. Compare applications by type and uncovered debts, without mistaking a smaller bank loss for greater production. The worked calculation shows why collateral can make a lower repayment attractive to both roles. Ask whether an applicant rejected because of wealth risk or expected monetary



Set an offer

Round 1 of 6 · Lender

Two projects per market: one of each class.

Information available for quoting

High-probability project	1
Low-probability project	1

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning 100 + 30 ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

Open the offer?

- ☐ Yes
☐ No

High-probability project repayment (ECU)

Low-probability project repayment (ECU)

Continue

Figure 3.1: The lender quotes by class in the public-information contrast.

value; the decision record cannot distinguish those motivations without additional measurement. Bester provides a screening mechanism involving collateral, under assumptions simplified by this teaching activity ([Bester, 1985](#)).

3.4 Forty-unit collateral

Collateral reaches the full initial wealth of 40 ECU. This compares protection intensity without changing project technology. Failure losses rise and can reduce applications from a class even when recovery per funded loan improves. To evaluate access, report application counts before calculating uncovered-debt rates. A smaller denominator can generate a low default rate without greater inclusion. Compare this condition with twenty-unit collateral through the participation equation, rather than realized profits alone. Ask which assets become exposed and whether collateral covers the whole debt; forty remains below the hundred-unit principal. The mechanism follows the same contractual screening problem ([Bester, 1985](#)). The activity does not assume unlimited collateral, and its fixed wealth makes that restriction visible in both the instructions and accounting.

3.5 Secured and unsecured menu

One lender quotes two promises: an unsecured contract and one pledging 20 ECU. Applicants choose a single menu contract or do not apply. Applications to both contracts share the same slot and lottery. The menu introduces self-selection but does not force each class into a different contract. Calculate each class's value from both offers and from nonparticipation before identifying separation, pooling or indifference. The guide's worked example contains an indifference that prevents a claim of strict separation. Aggregate composition and exports allow reconstruction of contract choices by type; never project an individual-level file. Connect the exercise to Bester as related theoretical support while stating the discrete restrictions imposed by the classroom menu ([Bester, 1985](#)).

3.6 Eighty-percent accurate score

A high signal matches the high-probability class and a low signal matches the other class, each with 80% accuracy. Signals are drawn independently, so two high or two low signals can appear despite the market containing one project of each class. The lender sees counts and quotes by signal; applicants retain knowledge of their own projects. With a marginal prior of one half, a high signal implies a marginal 80% probability of high class. Observing both signals also permits joint inference using the known composition. Do not present the marginal posterior as exhausting all information available in the market. Examine quotes by signal and funded composition. Probability updating here is an original derivation from the design, rather than a replication of one particular study.

3.7 Sixty-percent accurate score

Accuracy falls from 80% to 60%, preserving the same counts and quote structure. The change moves the score toward weak information; it does not change production probabilities. A poorer score may reduce price differences or produce classification mistakes if treated as certainty. Compare both score conditions with the common contract. The information prediction concerns expected decisions under correct use of evidence; it does not guarantee monotonic realized credit over six



Set an offer

Round 1 of 6 · Lender

Two projects per market: one of each class.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning 100 + 30 ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

The lender offers a menu: one unsecured contract and one with 20 ECU collateral. You may choose only one; both share the same capacity.

Open the offer?

- ☐ Yes
☐ No

Unsecured repayment (ECU)

Secured repayment (ECU)

Continue

Figure 3.2: A menu contains two promises and shared capacity.



Choose an application

Round 1 of 6 · Applicant

Your private project

High-probability project: 90%; 160.00 ECU

Your project information is private unless these instructions specify public types.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Your choice

- ☐ Do not apply for credit
- ☐ Lender 1: repayment 130 ECU; collateral 0 ECU
- ☐ Lender 1: repayment 150 ECU; collateral 20 ECU

Continue

Figure 3.3: Applicants select a single menu contract.

rounds. Ask what evidence could contradict a classification and why a low signal is distinct from certain failure. Exports separate signal, type and success draw, allowing subsequent analysis to distinguish classification error from an unfavorable realization of a correctly classified project. Neither category should be inferred solely from one person's realized repayment.

3.8 Two lenders

The market contains two lenders with one slot each and two applicants. Offers are simultaneous and applicants choose one destination. Competition may reduce repayments, but capacity without reassignment can remain unused when applications concentrate. Compare total funding with applications directed to each lender in the private data. The aggregate report shows unmet demand and profits without identifying people. Ask whether an empty slot demonstrates absent demand or demand directed toward another contract. The contrast also increases potential credit supply relative to the reference; use the single-lender two-slot condition to discuss that difference. This is discrete competition with an allocation friction, rather than a universal prediction about perfectly competitive banking. Identifying that design boundary helps students distinguish price competition from capacity and matching effects.

3.9 Competition with scores

Two lenders observe the same signal counts with 80% accuracy and may quote by signal. Comparing this with competition without scores holds total capacity at two slots, helping separate information from potential quantity. Better classification can change relative prices and selection,



Set an offer

Round 1 of 6 · Lender

Two projects per market: one of each class.

Information available for quoting

High signal	1
Low signal	1

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning 100 + 30 ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

Open the offer?

- ☐ Yes
☐ No

High-signal repayment (ECU)

Low-signal repayment (ECU)

Continue

Figure 3.4: Signals appear as counts and permit two quotes.



Choose an application

Round 1 of 6 · Applicant

Your private project

High-probability project: 90%; 160.00 ECU

High signal

Your project information is private unless these instructions specify public types.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Your choice

- ☐ Do not apply for credit
- ☐ Lender 1: repayment 130 ECU; collateral 0 ECU

Continue

Figure 3.5: Applicants know their class and the signal applicable to their offer.

but applications may still concentrate at one lender. Evaluate signals, funded types and uncovered debts together; an apparently informative signal can accompany an unfavorable outcome. Ask what would change if lenders received different information, while clarifying that this scenario is not implemented. Information is common to lenders, while each applicant's class remains private. Predictions combine the specified contracting mechanism with the stated probability rule; they are not attributed to a published experimental replication. Record both quotes before discussing whether information intensified competition or changed its distributional effects.

3.10 Per-loan subsidy

An external account transfers ten ECU for each loan actually funded, regardless of success. No payment is made for an unfunded application or a closed offer. A lender may pass support through into lower repayment, retain it, or change willingness to lend. Compare quotes and selection before interpreting private profit. Total external cost equals ten times funded loans and must be subtracted when evaluating surplus inclusive of the policy funder. Ask whether higher measured profitability reflects additional production or a transfer. Gale provides related theory about interventions changing contractual constraints (Gale, 1989); this uniform classroom transfer does not reproduce every equilibrium or welfare result in that work. The separate fiscal ledger makes incidence visible even when private outcomes appear uniformly favorable.



Set an offer

Round 1 of 6 · Lender

Two projects per market: one of each class.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning $100 + 30$ ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

Open the offer?

- ☐ Yes
☐ No

Common contract promised repayment (ECU)

Continue

Figure 3.6: Each lender decides without seeing the other simultaneous quote.



Choose an application

Round 1 of 6 · Applicant

Your private project

Low-probability project: 50%; 288.00 ECU

Your project information is private unless these instructions specify public types.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Your choice

- ☐ Do not apply for credit
- ☐ Lender 1: repayment 130 ECU; collateral 0 ECU
- ☐ Lender 2: repayment 130 ECU; collateral 0 ECU

Continue

Figure 3.7: Two open offers compete for each person's single application.

3.11 Principal-loss guarantee

The external account covers half the positive difference between one hundred and actual collection. Support excludes interest and does not increase the applicant's obligation. It can therefore reduce lender losses without directly changing borrower participation; altered applications follow from changed offers or allocation. Compare it with the subsidy: one pays for funding while the other depends on realized losses. Six rounds can produce very different costs by chance. Keep expected cost separate from realized cost. Ask who absorbs the remaining half and whether uncovered debt can coexist with a creditor's profit. Connect discussion to credit policies in Gale while preserving this adaptation's exact rule (Gale, 1989). A guarantee improves private recovery but is not itself additional project output, a distinction essential for the welfare discussion.

3.12 Two credit slots

One lender receives two hundred ECU and can fund both applicants. This removes excess applications caused by capacity when an offer is open, but does not eliminate contractual selection. A slot can remain empty if one class does not apply. Compare with two lenders to separate total capacity from the number of suppliers. Initial bank wealth rises to two hundred, so compare net profits and loan counts rather than closing balances alone. Under risk neutrality and independent project outcomes, expected profit from funding two applications is the sum of the two expected profits. Ask which exclusions observed in the reference would persist after capacity expands, using application counts to justify the answer. Extra slots cannot fund an applicant who declines the available terms.

3.13 Lender-chosen quota

With resources for two loans, the lender chooses zero, one or two slots in addition to repayment. Unused capital is retained. Zero capacity produces no loans even if the offer is marked open; applicants see no fundable contract from that lender. This condition distinguishes available capacity from offered quantity. A voluntarily smaller quota can reflect expected profitability, risk aversion or incomplete understanding; the outcome alone does not identify which. Compare the choice with expected profits and with fixed two-slot capacity. When teaching rationing, distinguish an institutional constraint from a supply decision. Ask whether a higher repayment would always permit profitable capacity expansion. The changing applicant mix demonstrates why acceptance must be recalculated before making that inference, rather than treating demand quality as fixed.



Set an offer

Round 1 of 6 · Lender

Two projects per market: one of each class.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning $100 + 30$ ECU.

The lender chooses a quota of 0, 1 or 2 loans. Zero means no lending. Unused capital is retained.

Open the offer?

- ☐ Yes
☐ No

Common contract promised repayment (ECU)

Loan quota

Continue

Figure 3.8: The lender may retain capital by limiting the quota.

3.14 Repayment ceiling

The allowed repayment maximum falls to 130 ECU while principal stays at one hundred. The reference permits up to one hundred eighty. With private types and no support, a common promise of one hundred thirty yields expected collection of ninety-one when both classes apply; the lender expects a loss of nine per loan. Closing the offer can therefore be coherent, rather than a participation failure. A ceiling may protect funded applicants while reducing willingness to offer credit. Examine open offers before calculating rates among loans. Ask which additional intervention would change that calculation and what it would cost. This numerical result derives

from classroom parameters; it is not a recommendation about actual regulation, where costs, competition, legal protections and selection can work differently.

3.15 Funding cost

Every funded loan incurs an additional ten ECU funding charge. The lender receives a matching initial reserve, giving one-slot resources of one hundred ten; the charge is deducted at settlement. Unused principal or reserve is retained. The charge shifts net profit without changing project income or the applicant's outside option. Under the common repayment of one hundred fifty, expected profit falls from five to minus five per loan. If the offer closes, absent credit does not by itself demonstrate stronger adverse selection: costs also changed. Compare with the ten-unit subsidy, which shifts the margin in the opposite direction. Ask why comparing closing wealth without allowing for initial endowments would give a misleading account of the lender's response.

3.16 Higher outside income

Income without a loan rises from nine to twenty, leaving wealth, technology and principal unchanged. The high-probability threshold becomes $160 - 20/0.9$, approximately 137.78. On the allowed grid, that class weakly accepts up to one hundred thirty. The other class retains a threshold above the maximum. Composition can therefore change at lower promises even though physical projects are unchanged. Compare applications and offers before looking at total credit. Ask why a better outside opportunity can reduce observed access without making applicants worse off. Remaining without a loan is now consistent with choosing a more valuable alternative. The condition teaches participant selection, rather than a productivity shock or a moral change in willingness to repay. Evaluate welfare using the improved outside outcome as well as funded projects.

3.17 Lower wealth with collateral

Personal wealth falls to twenty and collateral is set at twenty. Compare this with twenty-unit collateral and wealth of forty: absolute exposure is identical but now encompasses all available wealth. Under risk neutrality and unchanged outside income, monetary participation thresholds stay the same because wealth cancels. Preferences sensitive to wealth levels can break that equivalence. The comparison supports discussion of liquidity and risk without introducing a spurious access constraint: both groups can still pledge the required collateral. Compare applications while accounting for the different initial wealth.

3.18 Partial collateral recovery

Forty units of wealth are pledged, but the lender receives only half of seized collateral. The applicant loses the full seized amount and the remainder is recorded as liquidation loss. Compare with forty-unit collateral under full recovery. At an identical offer, applicant participation does not directly change: the applicant's wealth loss is unchanged. Lender profitability does change and may induce different terms, which alter selection. Unrecovered collateral is destroyed. Liquidation loss reduces joint surplus.

Running the session and reading the report

4.1 Participant sequence and comprehension

The first screen displays institutional logos, introduces the laboratory and requests agreement to silence and privacy rules. Specific instructions and the condition's actual resources follow. Lenders learn their budget and available slots; applicants learn personal wealth and their private project. Read rules aloud only if doing so consistently for everyone. Do not announce that a particular class should reject a repayment: that comparison belongs to learning and feedback after choices have been recorded, rather than participant instructions before choice.

The comprehension check covers three shared rules: a promise of one hundred thirty includes principal, repayment is automatic, and one slot cannot finance two applications. An incorrect response produces an explanation beside its question and retains answers for correction. The instructor can help locate the rule, but should not advise which offer maximizes profit. Questions deduct no ECU and do not measure financial intelligence. If many participants misunderstand the same rule, pause and repeat the settlement example without discussing strategy. This protects the distinction between understanding the institution and receiving an answer to its economic problem.

Lenders set opening and repayment; class- or signal-specific contracts require two values. A menu requires separate unsecured and secured promises. Once all offers in a market are recorded, applicants see applicable contracts and select one or none. The program waits for all choices, allocates loans using random priority when required and settles outcomes. Wait screens state that other people's decisions are outstanding. Do not resolve them by closing tabs or fabricating administrative choices. A real missing participant leaves a real synchronization requirement.

Each role receives its own outcome. Funded applicants see application, funding, income, collection and seized wealth. Unfunded applicants receive wealth plus outside income, without an executed project. Lenders see aggregate portfolio loans, collections, profit, external cost and liquidation loss, without an identified list of types. Continuing ends the round or starts the next one. After the final active round, an explicit closing screen displays average wealth. Averaging prevents ten rounds from mechanically multiplying a single interaction's balance; resources do not compound across rounds.

Checkpoint

Before distributing links, check both endowments, capacity, language and treatment. Also confirm that titles, captures and instructions contain no internal production codes. JEL classifications and actual round numbers do serve a teaching purpose.



Loans and projects

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

Laboratory rules

- Remain silent and do not communicate with others.
- Make decisions individually and privately.
- Follow the instructions on screen.
- Do not refresh, close or leave the page.
- Raise your hand and ask privately if you need help.

I have read and accept these rules.

☐ Yes

☐ No

Start

Figure 4.1: General rules and agreement before starting.

4.2 Progress, revelation and denominators

Open the report from the administrative session. It initially shows participants, settled and pending markets, offers recorded and application decisions recorded. Choosing not to apply counts as a recorded decision, rather than a positive credit application. A closed offer also counts as a decision but not as an open contract. In repeated sessions, progress totals include all active rounds. At the beginning, some pending markets have not yet been played. Pending therefore does not necessarily mean that a participant abandoned the activity or failed to understand it.

Monetary and selection outcomes use settled markets only. One outstanding applicant prevents settlement of that market but does not prevent revelation of completed markets. If revealing partial results, state their coverage and avoid comparing groups whose response speed might itself relate to choice. Refreshing the report hides aggregates again. Revelation is a deliberate presentation action, rather than a signal delivered to participants or a change to their payoffs. Keep the report on the instructor's screen until the discussion is ready to use it.

The composition table reports assigned applicants, applicants selecting an offer, funded applicants, unfunded applications, uncovered debts and productive failures by class. Assigned refers to applicants in settled markets, including those who declined credit. Applicants counts positive choices; funded counts executed loans. Unmet demand subtracts funded loans from positive applications. A pending application is neither rejection nor zero. Uncovered debt means collection below the promise; productive failure means that the project produced zero. These definitions permit defaults caused by a high promise to be distinguished from failed production.

The funding rate divides loans by positive applications. The uncovered-debt rate divides uncovered cases by loans, rather than all participants. If nobody applies, the first rate displays a dash. Mean profit uses lender-rounds; applicant wealth uses applicant-rounds. External cost is summed because it measures actual support disbursements. Do not compare that total with a mean



Instructions

Resources and unit of account

Each round, each lender has 100 ECU and each applicant keeps 40 ECU of personal wealth. Each 100 ECU loan is invested directly in the project; it is not added to personal cash. Resources renew each round.

Without a loan, an applicant receives personal wealth plus 9 ECU of alternative income.

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

This session does not convert ECU into real money.

Your role: **Lender**

Project class	Success probability	Income if successful (ECU)
High-probability project	90%	160.00
Low-probability project	50%	288.00

Each market has 1 lender(s) and two applicants. One project of each class is randomly assigned between the applicants every round. Roles stay the same; project class is drawn again every round.

Each project produces the stated income if successful and 0 ECU otherwise. Probabilities are known and draws are independent. Applicants choose neither effort nor their project.

The lender knows both classes and their composition but does not observe each applicant's class. One common offer applies to both.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning 100 + 30 ECU.

Figure 4.2: Lender resources and rules; individual project assignment is absent.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning 100 + 30 ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Collection is automatic: you never choose repayment. Debt not covered by income and collateral creates no additional debt. Alternative income is earned only without funding.

The final outcome is mean closing wealth over active rounds. Balances renew: capital does not accumulate across rounds.

One interaction.

Settlement example: debt 130, income 0, wealth 40 and collateral 20. The applicant retains 20; the lender recovers 20 and loses 80 of principal before support. Without a loan and with alternative income 9, the applicant would have 49. This is an example; use your screen's actual parameters.

Continue

Figure 4.3: Collection, capacity and settlement rules continued.

without adjusting units. Explain the denominator before the value, especially when a treatment reduces participation and changes the funded population. The report's apparent precision reflects accounting, not the statistical certainty of a small classroom sample.

4.3 Distributions, evolution and reference calculations

The repayment distribution counts open promises, one per quoted contract. Under public types, scores or menus, one lender contributes two promises; the reference contributes one. A promise attracting no applications still enters the distribution if open. The histogram is weighted neither by funded loans nor requested quantity. Explain that unit before comparing bar heights across institutions. To reconstruct repayments actually financed, use funded debt columns in the private data with an explicitly defined loan denominator. Quote distributions and financed-contract distributions answer different questions.

Evolution provides one row per active round: assigned applicants in settled markets, applications, loans, unmet demand, low-probability share among funded projects, uncovered debts and bank profit. Rounds without settled markets retain missing outcome denominators. The curve uses a solid line for the low-probability project share and a dashed line for uncovered debt, on a vertical scale from zero to one hundred percent. Funded composition can jump even when an offer changes only slightly; that is a reason to display the sequence. With only two applicants per market, a small change in counts can produce a large percentage movement. Read counts and rates together, and do not interpret a visually striking change as automatically precise evidence about a population.

The reference table calculates participation and expected profit for a common contract at each allowed promise. It uses actual outside income, collateral, subsidy, guarantee and funding-cost parameters. It assumes risk neutrality, weak acceptance and equal initial representation of the two classes. When one class exits, the mix is recalculated. This is neither a menu optimizer nor an equilibrium prediction for competition or signal-specific quotes. Its purpose is to challenge the intuition that increasing a promise necessarily improves a lender's return. State that scope before



Instructions

Resources and unit of account

Each round, each lender has 100 ECU and each applicant keeps 40 ECU of personal wealth. Each 100 ECU loan is invested directly in the project; it is not added to personal cash. Resources renew each round.

Without a loan, an applicant receives personal wealth plus 9 ECU of alternative income.

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

This session does not convert ECU into real money.

Your role: **Applicant**

Your private project

High-probability project: 90%; 160.00 ECU

Your project information is private unless these instructions specify public types.

Project class	Success probability	Income if successful (ECU)
High-probability project	90%	160.00
Low-probability project	50%	288.00

Each market has 1 lender(s) and two applicants. One project of each class is randomly assigned between the applicants every round. Roles stay the same; project class is drawn again every round.

Each project produces the stated income if successful and 0 ECU otherwise. Probabilities are known and draws are

Figure 4.4: The applicant's own project information remains private.

applicants every round. Roles stay the same; project class is drawn again every round.

Each project produces the stated income if successful and 0 ECU otherwise. Probabilities are known and draws are independent. Applicants choose neither effort nor their project.

The lender knows both classes and their composition but does not observe each applicant's class. One common offer applies to both.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning $100 + 30$ ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Collection is automatic: you never choose repayment. Debt not covered by income and collateral creates no additional debt. Alternative income is earned only without funding.

The final outcome is mean closing wealth over active rounds. Balances renew: capital does not accumulate across rounds.

One interaction.

Settlement example: debt 130, income 0, wealth 40 and collateral 20. The applicant retains 20; the lender recovers 20 and loses 80 of principal before support. Without a loan and with alternative income 9, the applicant would have 49. This is an example; use your screen's actual parameters.

Continue

Figure 4.5: Applicant instructions continued.



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.

For a 100 ECU loan promising repayment of 130, what is the total promised repayment (ECU)?

Your answer: 30. The correct answer is 130. Promised repayment includes principal and interest: $100 + 30 = 130$ ECU.

Can you choose not to repay a loan when your income covers it?

- ☒ Yes
☐ No

Your answer: Yes. The correct answer is No. No. Collection is automatic, limited by income and collateral; there is no repayment choice.

If two applicants compete for one slot, are both financed?

- ☒ Yes
☐ No

Your answer: Yes. The correct answer is No. No. One slot funds one application, selected by lottery. The other applicant receives the outcome without a loan.

Continue

Figure 4.6: Each error explains the rule and retains submitted answers for correction.



Set an offer

Round 1 of 1 · Lender

Two projects per market: one of each class.

Each lender may open or close the offer. An open offer must promise repayment between 100 and 180 ECU, in 10 ECU increments. Repayment includes principal: 130 means returning $100 + 30$ ECU.

Each lender can finance at most 1 loan(s). If applications exceed capacity, a uniform lottery selects funded applicants; there is no second application or automatic reassignment.

Open the offer?

- ☐ Yes
☐ No

Common contract promised repayment (ECU)

Continue

Figure 4.7: Promised repayment includes principal; opening the offer is a choice.

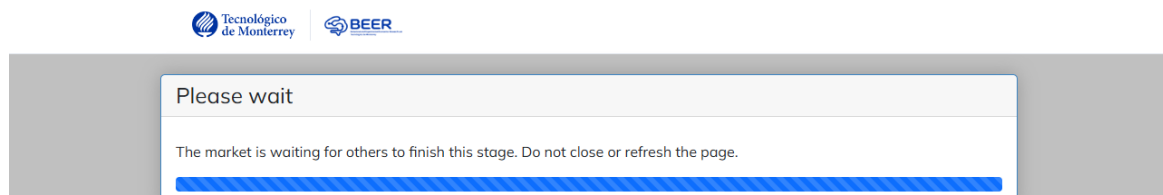


Figure 4.8: Waiting synchronizes actual market decisions.



Choose an application

Round 1 of 1 · Applicant

Your private project

Low-probability project: 50%; 288.00 ECU

Your project information is private unless these instructions specify public types.

After seeing open offers, each applicant selects one offer or none. Applying does not guarantee funding. Anyone not funded keeps personal wealth and receives alternative income.

Your choice

- ☐ Do not apply for credit
- ☐ Lender 1: repayment 130 ECU; collateral 0 ECU

Continue

Figure 4.9: Applying for a contract does not guarantee funding.



Round outcome

Round 1 of 1 · Lender

Closing wealth (ECU)	130.00
Lender net profit	30.00
Loans funded	1.00
Collection received by lender	130.00
External account cost	0.00
Liquidation loss	0.00

Continue

Figure 4.10: The lender's portfolio settles without identified types.



Round outcome

Round 1 of 1 · Applicant

Closing wealth (ECU)	198.00
Did you apply?	Yes
Loan funded?	Yes
Project income	288.00
Collection received by lender	130.00
Personal wealth seized	0.00

Continue

Figure 4.11: Individual settlement separates collection and wealth.



The activity has ended

Your decisions have been recorded. Please wait for the instructor's directions.

Mean wealth over active rounds (ECU): **130.00**

Figure 4.12: Closure displays average wealth across active rounds.

Instructor report: credit with adverse selection

Common contract

Aggregates for this session. Private types appear only in aggregate outcomes here. Do not project exports containing individual codes.

Participants: 6	Settled markets: 0	Pending markets: 2	Offers recorded: 0 / 2
Application decisions recorded: 0 / 4			
Download this session's round-level data		Download this session's wide file	

No markets have settled yet. Pending decisions are excluded from outcome averages.

Figure 4.13: An empty report displays progress without inventing decisions.

Instructor report: credit with adverse selection

Common contract

Aggregates for this session. Private types appear only in aggregate outcomes here. Do not project exports containing individual codes.

Participants: 6	Settled markets: 1	Pending markets: 1	Offers recorded: 2 / 2
Application decisions recorded: 2 / 4			
Download this session's round-level data Download this session's wide file Hide aggregates			
Mean profit per lender-round			30.00
Mean wealth per applicant-round			123.50
Total external cost			0.00
Funded / applications			50.00%
Uncovered debts / loans			0.00%

Composition and access by project class

Your private	Applicants choosing	Applications without	Uncovered	Productive
--------------	---------------------	----------------------	-----------	------------

Figure 4.14: Partial coverage identifies markets still pending.

Instructor report: credit with adverse selection

Common contract

Aggregates for this session. Private types appear only in aggregate outcomes here. Do not project exports containing individual codes.

Participants: 6	Settled markets: 2	Pending markets: 0	Offers recorded: 2 / 2
Application decisions recorded: 4 / 4			
Download this session's round-level data Download this session's wide file Reveal aggregates			

Figure 4.15: Completed results require explicit revelation.

Instructor report: credit with adverse selection

Common contract

Aggregates for this session. Private types appear only in aggregate outcomes here. Do not project exports containing individual codes.

Participants: 6 Settled markets: 2 Pending markets: 0 Offers recorded: 2 / 2
 Application decisions recorded: 4 / 4

[Download this session's round-level data](#)

[Download this session's wide file](#)

[Hide aggregates](#)

Mean profit per lender-round	-35.00
Mean wealth per applicant-round	84.00
Total external cost	0.00
Funded / applications	50.00%
Uncovered debts / loans	50.00%

Composition and access by project class

Project class	Assigned	Applicants choosing an offer	Funded	Applications without funding	Uncovered debts	Productive failures
High-probability project	2	2	0	2	0	0
Low-probability project	2	2	2	0	1	1

Outcome measures use settled markets only. Each person-round counts once; a pending application is not rejection. Uncovered debt means actual collection below promised repayment; productive failure means zero project income.

Figure 4.16: Revealed aggregates compare composition and access.

using the table as a benchmark for any extension.

For feedback, first compare promises of one hundred fifty and one hundred sixty in the theoretical reference. Then locate observed decisions: did the high-probability class leave, which class received credit, and which part of profit reflects selection versus chance? A high collection in one round does not refute an expected loss. A realized loss does not establish a bad ex ante decision. Request an explanation based on probabilities before allowing one project's anecdote to dominate group interpretation. Repeated observations can make the contrast clearer, but do not eliminate the need to explain the underlying conditional expectation.

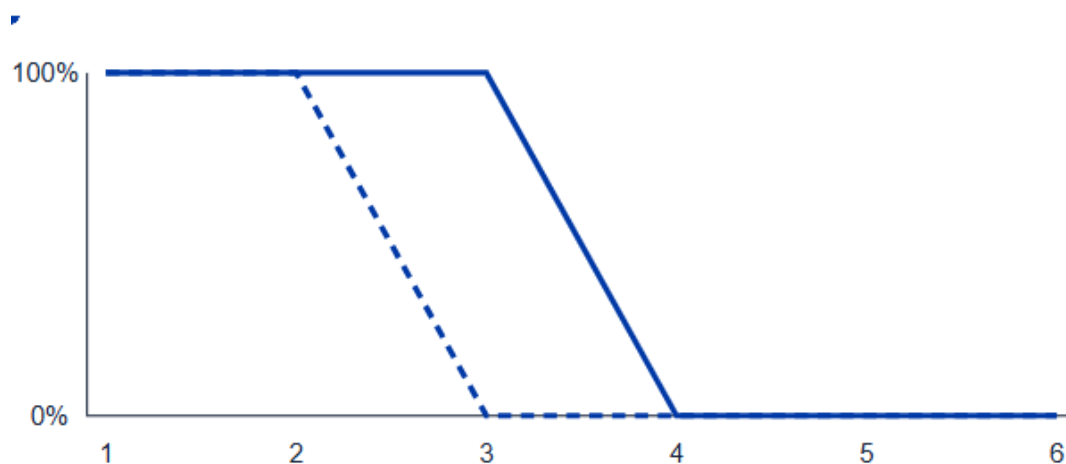


Figure 4.17: The six-round curve shows composition and uncovered debts among loans.

Signal	High-probability project	Low-probability project	Funded
High signal	1	0	1
Low signal	0	1	0

Figure 4.18: The score table separates signals from actual classes, with explicit partial coverage.

Your choice	High-probability project	Low-probability project	Funded
Unsecured	0	0	0
Secured	1	1	1

Figure 4.19: The menu records contract selection by class without identifying people.

4.4 Data, privacy and reconstruction

The report offers two downloads scoped to the selected session code. The round-level file contains one row per participant and technical round; the native wide file contains one row per participant with repeated round columns. The application has ten technical rounds to support basic repeated modes. In a one-interaction session, remaining rounds are inactive; extended sessions use six active rounds. Those rows are not nine or four missing decisions. A status column distinguishes completed, pending and inactive observations, making the difference explicit before any averaging or aggregation.

Round-level data record language, edition, condition, matching rule, market, role, project, signal, draws, offer, quota, application, funding, debt, collateral, wealth and settlement details. Fields for

Project class	Assigned	Applicants choosing an offer	Funded	Applications without funding	Uncovered debts	Productive failures
High-probability project	2	2	0	2	0	0
Low-probability project	2	2	2	0	1	1

Figure 4.20: Read assignment, application and funding separately.

ECU	Offers	%
100–120	0	0%
130–150	2	100%
160–180	0	0%

Figure 4.21: The distribution counts open promises rather than loans.

unrecorded decisions remain blank, as do loan amounts for nonexistent loans. Zero has a different meaning: no application is choice zero, and a funded loan can collect zero. Preserve this distinction when importing data into a spreadsheet or statistical package. Automatically replacing every blank with zero would change both participation measures and monetary averages.

Individual codes permit private linkage across rounds; they should not be projected or distributed as collective feedback. The visible report provides no table of individual codes or participant links. If classroom data are used for another purpose, instructors must follow relevant institutional procedures; this guide does not turn a teaching activity into an approved research protocol. Demographic information is not collected by default, and names are unnecessary for teaching the mechanism. Store downloaded files with the same care as other class records containing individual decisions.

Reconstruction begins by filtering session, status and active rounds. Group applicants by market-round and verify that funded loans do not exceed the chosen lender's capacity. Recompute income collection, seized wealth, recovery, support and closing balances. For each loan, applicant wealth plus principal plus lender profit must equal initial applicant wealth plus output plus support, minus liquidation loss and funding cost. Internal transfers cancel. Finally, average each person's active rounds and compare with the recorded payoff. This identity detects double-counted principal or subsidies without relying on a theoretical expectation or judging whether observed behavior was optimal.

Round	Assigned	Applicants choosing an offer	Loans	Applications without funding	Low-probability project (%)	Uncovered debts / loans	Lender net profit
1	4	4	2	2	100.00%	50.00%	-35.00

Figure 4.22: The sequence retains round counts and denominators.

Evidence, discussion and classroom closure

5.1 What the literature and adaptation contribute

Stiglitz and Weiss (1981) explain why a loan's price can change the borrower pool and incentives, so market clearing through a higher rate is not automatic (Stiglitz and Weiss, 1981). This family retains only prior private information and exogenous project types. Its values, contract grid, two applicants and capacity are original teaching choices. The numerical comparison between one hundred fifty and one hundred sixty follows from those choices, rather than being presented as an empirical estimate. Maintaining this separation helps an instructor use theory without claiming a literal replication of the original model.

Bester (1985) studies screening through combinations of interest and collateral (Bester, 1985). The classroom menu permits participation calculations and contract comparisons, but restricts the number of options and implements neither free entry nor every competitive-market assumption. Type-specific choices are therefore consistent with self-selection without proving that the observed menu is a separating equilibrium. Gale analyzes credit-market interventions and the constraints shaping their consequences (Gale, 1989). Subsidy and guarantee conditions use that question as motivation, with explicit rules and traceable costs rather than a claim to reproduce all of the paper's institutions.

Karlan and Zinman (2009) distinguish hidden information and hidden action through experimental variation in credit offers, actual contract terms and repayment incentives. They report strong evidence of moral hazard and weaker evidence of hidden-information problems (Karlan and Zinman, 2009). The methodological lesson is that an interest-default correlation does not by itself identify adverse selection. This game removes effort and voluntary-payment decisions to expose one channel. It reproduces neither the field experiment nor its magnitudes, and it cannot establish how much default in actual lending comes from either mechanism.

Jack and coauthors study borrowing requirements and access in Kenya using an offer that changes required collateral (Jack et al., 2016). That evidence illustrates why contractual restrictions can change participation and composition, although the assets, borrowers and setting differ from this classroom. Finally, Arnold and Riley's discussion of the Stiglitz-Weiss model cautions against generalizing a revenue-curve shape without checking assumptions (Arnold and Riley, 2009). Use the discrete curve calculated here to teach a possible mechanism, rather than a universal law. Previous evidence guides questions; classroom observations illustrate choices under these particular rules. This distinction also supports honest discussion when observed choices depart from the benchmark.

5.2 A classroom plan and exercises with answers

For a fifty-minute class, reserve five minutes for access and rules, eight for reading and comprehension, seven for choices and settlement, fifteen for reconstruction and ten for an institutional comparison. Use the final five for an individual written response. In a longer class, run six rounds and a comparison condition, allowing ten additional minutes to examine evolution. Timing depends on reading and discussion. Do not rush a real synchronization requirement or treat the number of clicks as a measure of learning.

For verbal instructions, say: “Read your role, resources and collection rule. Decide privately; we will discuss results afterward.” Once everyone finishes, draw columns for probability and successful income. Ask students to calculate 144 for both classes. Then introduce a promise of one hundred fifty and ask what each applicant gains relative to forty-nine. Reveal composition and funding only after that calculation. This sequence distinguishes recorded behavior from reasoning the instructor has just taught, rather than treating coached choices as independent observations.

Exercise one: at debt of one hundred sixty without collateral, which class accepts under risk neutrality? Answer: the high-probability class expects forty, below forty-nine; the low-probability class expects one hundred four, above forty-nine. Only the second accepts. Expected lender collection is eighty and profit is minus twenty. Multiplying one hundred sixty by seventy percent incorrectly retains the initial composition after one class exits. Ask the student to identify the missing conditioning event rather than simply replacing their numerical answer.

Exercise two: both applications select the same lender while another slot is empty under competition. How many loans are funded? Answer: one, because each applicant files a single application and there is no reassignment. The remaining application represents unmet demand and the other slot stays unused. This illustrates an allocation friction; it does not show that total capital was insufficient. Funding both applications would add a second stage absent from the stated rules. Distinguishing that assumption is part of the exercise’s economic purpose.

Exercise three: income is zero, collateral forty and recovery one half. Answer: the applicant loses forty, the lender receives twenty and twenty are destroyed. With a half-principal guarantee, the external account additionally pays forty because one hundred minus twenty is eighty. Distinguish those flows from promised repayment. At closure, request one sentence linking contract, selection and collection, and another stating a conclusion the class still cannot support about actual credit markets.

Feedback script

“The promise changed first, then the set willing to apply changed, and finally income was realized. Which step explains the fall in expected collection? What remains unexplained if we look only at one round’s profit?” Revisit answers using counts before percentages.

Troubleshooting and operational closure

If a screen waits indefinitely, inspect every market position’s progress. Lenders must record offers before applications are released; all applicants must decide before settlement. Do not change an active session’s size to resolve a dropout. A student who opened two links may control two positions while another remains unattended. Identify the correct distribution privately and continue with actual positions, without publishing individual links in the report. The program does not manufacture a missing person’s response, so synchronization is evidence of a real unfinished stage.

If a link reports that a user does not exist or the database was reset, it belongs to an earlier session. Create a fresh session and distribute current links. Restarting an instance to update code does

not require deleting its database; do not use deletion as a general remedy. If Demo contains other games or Rooms lists more than four entries, postpone starting until coordination checks isolation. An unpublished catalogue card does not invalidate a local preview, but production deployment is required before distributing the public domain.

When results surprise, first verify treatment and denominators. Under partial recovery, seized wealth and lender collection differ. With a guarantee, external support and applicant repayment also differ. A closed offer is a recorded decision, rather than an observed zero-sized loan. In a one-interaction session, inactive technical rounds are neither losses nor dropouts. Opening the report from the final technical round explicitly reconstructs all active periods. The instructor need not visit every period to gather them, and should not substitute missing future outcomes with zeros.

Attention

Do not interpret uncovered debt as a decision to default. Collection is automatic and the game contains no hidden effort. Also avoid calling every rejected application equilibrium rationing: identify capacity, offer closure, declined terms or concentrated applications first.

At the end, hide aggregates if reusing the projector, download only the relevant session and store condition and date alongside its file. Retain sources and guides for future preparation but generate new links for new participants. Close with the idea that contracts organize both transfers and selection. Missing credit can result from unattractive terms, limited resources or supply decisions. Each mechanism leaves a different trace in applications, funding and collections; the learning objective is to reconstruct that trace rather than to assign a single label to every exclusion.

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