



Instructor guide to credit relationships and reputation

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 credit relationships and reputation 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 a class on credit and continuity

1.1 The question and the financial mechanism

For the instructor

Collect decisions and written predictions first. Then show permitted histories and ask which future consequence could make payment attractive today. Do not announce a cooperative strategy as a participation requirement: the purpose is to reconstruct incentives and observe choices under common rules, including choices that differ from the proposed reference.

Why repay a loan when no outside mechanism compels payment? This question organizes the family. A lender decides whether to finance a project; the borrower sees terms, accepts or rejects, and receives income before choosing how much available payment to transfer. In the reference the borrower may meet the promise in full or retain the voluntary amount. Today's outcome may affect tomorrow's willingness to lend. Choices distinguish a contract that is profitable when honored from one people have incentives to honor, and make the distinction observable in a short classroom episode.

The difference from other financial families in the catalogue concerns timing and the object of choice. There is no private project type assigned before contracting or costly activity changing productivity. Reference income is known, and the subsequent action is payment. This is also distinct from a trust transfer with a multiplier: it includes funded investment, an obligation already containing principal, a no-credit alternative, access to successive loans and institutions governing records and enforcement. The accounts identify who finances, receives output and retains collection rather than treating every financial flow as an undifferentiated transfer.

The basic unit is a lender-borrower pair with stable roles. One interaction reveals immediate incentives; ten fixed-pair rounds permit continuity; ten rematched rounds without history reduce the ability to condition an offer on an identified counterpart's behavior. Random rematching can repeat partners. Extensions add bilateral or shared histories, errors and correction, income losses, enforcement, competition and other specified institutions. Both languages use identical economics. A translated edition is another complete interface rather than another experimental treatment or a separate teaching game.

1.2 Family summary and curricular selection

Purpose	Understand how continuity, information and enforcement affect repayment and credit access.
Experimental unit	Pair; two lenders and two borrowers under competition.
Participants	Even count, minimum two; multiples of four under competition.
Basic edition	One interaction; ten fixed rounds; ten rematched rounds without history.
Extended edition	Reference and sixteen extensions; ten rounds except probabilistic continuation capped at twenty.
Decision	Open finance, apply for a contract and transfer available voluntary payment.
Payoff	Sum of closing wealth over all played rounds; renewed resources.
Topics	Relationship lending, reputation, credit histories, voluntary repayment, information sharing, contract enforcement.
JEL	C73, C92, D82, G21, G28.
Suggested duration	40–60 minutes; allow additional time for institutional comparisons.

The activity fits banking, financial contracts, information economics and institutions courses. An introduction can use one-round accounts and the comparison between payment and retention. An intermediate course adds future access, shared histories and competition. Advanced students can separate backward induction from a hypothetical indefinite-continuation calculation. No utility-function estimation or trading-platform training is required. Students do need to understand that an invested loan is not simultaneously retained as personal cash. Clarifying that point usually improves the subsequent discussion more than introducing additional terminology.

The sixteen extensions are selected by mechanism and support rather than a numerical quota. Four executable products comprise basic and extended Spanish and English editions. Forty configurations and four rooms are access points rather than forty distinct games. A configuration maintains its rules throughout an episode. Compare conditions through separate sessions and state whether participants were randomized, chose a group or followed a common order that could generate learning. The curricular summary specifies teaching objectives; it does not convert classroom results into causal evidence or claim that a small demonstration reproduces an empirical paper.

1.3 Access, rooms and preparation before class

Start at <https://beer-lab.org/> and follow CLASS to <https://teaching.beer-lab.org/>. Search by title, topic or JEL code. Choose Español or English on the card and select the extended edition when appropriate. Catalogue language and session language are distinct choices. Captures document real navigation and the validated local instance; public availability of this delivery still requires laboratory deployment and publication. A proposed address in this guide is therefore a product route rather than evidence that a live server has already been published.

The proposed canonical domain is <https://relationshipcredit.beer-lab.org/>. Basic rooms are https://relationshipcredit.beer-lab.org/room/relaciones_credito_es and https://relationshipcredit.beer-lab.org/room/relationship_credit_en. Extended rooms are [relaciones_credito_extendido](#) and [relationship_credit_extended](#). Demo contains this family's forty configurations alone. Rooms contains four rooms, with selectors listing three, three, seventeen and seventeen configurations. Each basic room initially selects one interaction in its own language. A room provides session access rather than adding another economic treatment to the

design.

The instructor creates a session with a compatible count and distributes different participant links. Several tabs for one link are not different students. Roles are assigned at entry and remain stable. Competition uses fixed four-person markets; other conditions use pairs. Instructors receive instructions, progress, private reports and downloads for the selected session. Students receive only their role's permitted information and need no administrative account or production identifier. Experimental aliases support game history while avoiding names or student numbers in the information used for decisions.

Check devices and connectivity beforehand. Explain that resources renew while episode payoff sums closing wealth over rounds actually played. A current loss does not itself reduce next round's capital. Random continuation may end early or reach twenty; reserve adequate time and do not replace the draw with an instructor's discretionary stopping decision. The configuration includes no ECU-to-money conversion. Any external incentive requires a rule communicated before play, consistently applied to the episode rather than retroactively selecting a favorable round.

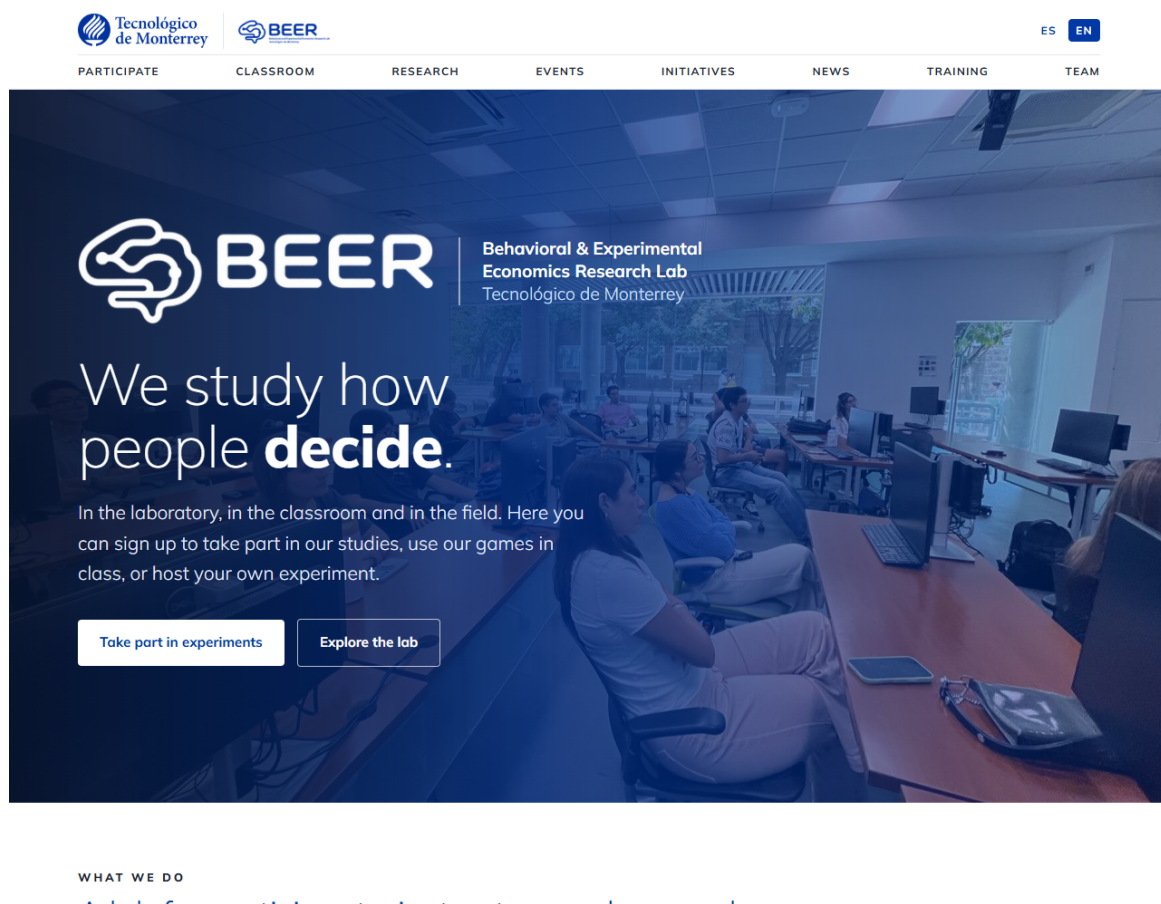


Figure 1.1: The CLASS entry leads to the teaching catalogue.

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

Topic
JEL code

150 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: advertising.beer-lab.org

Español
English

Show extended version

Credit with adverse selection

Relate credit terms to applicant composition and collection. Basic: One interaction; ten fixed-group rounds; ten rematched rounds. Extended: Reference and seventeen extensions, six rounds per condition.

adverse selection
credit contracts
collateral
credit rationing
asymmetric information
project risk

JEL C92 · D82 · G21

Address: adversecredit.beer-lab.org

Español
English

Show extended version

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

Demo

Relaciones de crédito y reputación · Básica · Una interacción
Relaciones de crédito y reputación · Básica · Diez rondas con pareja fija
Relaciones de crédito y reputación · Básica · Diez rondas con reasignación sin historial
Relaciones de crédito y reputación · Extendida · Relación bilateral e historial privado
Relaciones de crédito y reputación · Extendida · Reasignación con memoria bilateral
Relaciones de crédito y reputación · Extendida · Historial compartido completo
Relaciones de crédito y reputación · Extendida · Historial compartido con errores
Relaciones de crédito y reputación · Extendida · Errores y rectificación solicitada
Relaciones de crédito y reputación · Extendida · Historial con una ronda de retraso
Relaciones de crédito y reputación · Extendida · Historial de las tres rondas previas
Relaciones de crédito y reputación · Extendida · Pérdida de ingreso observable
Relaciones de crédito y reputación · Extendida · Pérdida de ingreso privada
Relaciones de crédito y reputación · Extendida · Continuación probabilística con límite
Relaciones de crédito y reputación · Extendida · Cobro automático del 50%
Relaciones de crédito y reputación · Extendida · Cobro automático completo
Relaciones de crédito y reputación · Extendida · Dos bancos con memoria bilateral
Relaciones de crédito y reputación · Extendida · Dos bancos con historial compartido
Relaciones de crédito y reputación · Extendida · Costo de cambiar de banco
Relaciones de crédito y reputación · Extendida · Promesa de pago elegida
Relaciones de crédito y reputación · Extendida · Ingreso alternativo de 40 ECU

Figure 1.3: Family configurations, first section.

Credit relationships and reputation · Basic · One interaction
Credit relationships and reputation · Basic · Ten rounds with a fixed partner
Credit relationships and reputation · Basic · Ten rematched rounds without history
Credit relationships and reputation · Extended · Bilateral relationship and private history
Credit relationships and reputation · Extended · Rematching with bilateral memory
Credit relationships and reputation · Extended · Complete shared history
Credit relationships and reputation · Extended · Shared history with errors
Credit relationships and reputation · Extended · Errors and requested correction
Credit relationships and reputation · Extended · History delayed by one round
Credit relationships and reputation · Extended · History from the previous three rounds
Credit relationships and reputation · Extended · Observable income loss
Credit relationships and reputation · Extended · Private income loss
Credit relationships and reputation · Extended · Probabilistic continuation with a cap
Credit relationships and reputation · Extended · Automatic collection of 50%
Credit relationships and reputation · Extended · Full automatic collection
Credit relationships and reputation · Extended · Two banks with bilateral memory
Credit relationships and reputation · Extended · Two banks with shared history
Credit relationships and reputation · Extended · Cost of switching banks
Credit relationships and reputation · Extended · Chosen repayment promise
Credit relationships and reputation · Extended · Outside income of 40 ECU

Figure 1.4: The same list continued.

Rooms

Current rooms:

Relaciones de crédito y reputación · Básica
Relaciones de crédito y reputación · Extendida
Credit relationships and reputation · Basic
Credit relationships and reputation · Extended

Figure 1.5: Four rooms for two languages and two editions.

oTree Demo Sessions Rooms Data Server Check Logout

Room: Credit relationships and reputation · Basic

Create a new session

Session Config

Credit relationships and reputation · Basic · One interaction

Number of participants

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

Create

[Configure session](#) ⚙️

App sequence

relationship_credit_game (20 rounds)

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://127.0.0.1:8100/room/relationship_credit_en

Figure 1.6: The basic room initially selects one interaction in its language.

Reconstructing payoffs and incentives over time

2.1 One loan, two payment decisions and three accounts

What participants will see

The borrower sees income before deciding. The reference includes no compulsory collection, and personal endowment does not secure debt. Other conditions may impose automatic collection or insufficient income; the screen separates automatic collection from the available additional amount. An unfunded round contains no repayment decision and should never be analyzed as a borrower choosing to default.

ECU stands for Experimental Currency Units. The reference gives the lender one hundred twenty and the borrower sixty each round. The loan is one hundred, invested entirely in a project yielding two hundred with certainty. The promise of one hundred twenty already includes principal and interest. Without credit, the borrower keeps sixty and earns eight in outside income; the bank keeps one hundred twenty. Borrower personal cash does not fund the loan, and principal is not added to wealth again after being invested.

With credit and full payment, the lender retains twenty uninvested and collects one hundred twenty, finishing with one hundred forty. The borrower keeps initial wealth sixty, receives project income two hundred and transfers one hundred twenty, also finishing with one hundred forty. Bank profit relative to endowment is twenty. The borrower gains seventy-two over outside wealth sixty-eight. Both are rents from continuing that contract, but they belong to roles controlling different decisions. Their size matters when the future is compared with the immediate gain from keeping a payment.

If the borrower retains all voluntary payment, the bank ends with twenty and loses one hundred relative to endowment. The borrower ends with two hundred sixty and gains one hundred twenty immediately compared with payment. Joint wealth remains two hundred eighty: payment distributes income rather than producing it. Without a loan, combined wealth is one hundred eighty-eight. Financing creates ninety-two in additional surplus. Retaining payment can prevent later projects without changing production from the project already financed, which separates the current transfer from the dynamic efficiency question.

Closure sums wealth over all rounds actually played and assigns the episode result once. Ten repaid reference loans produce one thousand four hundred per person. Ten unfunded rounds produce one thousand two hundred for the bank and six hundred eighty for the borrower. These are cumulative accounting units rather than balances available to finance extra projects during class. Paying the complete episode retains the monetary consequences of successive decisions and avoids changing

their interpretation through a later random selection of a single paid round.

2.2 Immediate incentives and backward induction

In one interaction without enforcement, a borrower who already received two hundred increases wealth by keeping one hundred twenty. If the lender anticipates that choice with certainty, offering costs one hundred with no recovery. Under exclusively monetary preferences, common understanding and no other consequences, withholding the loan is a best response. A productive project may therefore remain unfunded: productive profitability and enforceable payment are different constraints. Observed lending does not refute the accounts; it may reflect different expectations, preferences or understanding of the situation.

With ten known rounds, the monetary argument first applies to the last. If that round offers no future rents to lose, retaining payment is attractive after a loan. Anticipating this, the bank does not lend. The preceding round then loses its future reward, and the reasoning repeats. Under the same assumptions, backward induction removes financing throughout the episode when sufficient enforcement is absent. Ten repetitions do not guarantee payment, and instructors should not describe the last round as though participants were unaware of its existence or unable to reason about it.

This need not describe all behavior. People may value reciprocity, promise keeping or others' gains; they may also be uncertain about their counterpart's preferences. A relationship can sustain payments for several rounds and deteriorate near the end. Observe the pattern without automatically assigning one motive. Stable identity permits contingent offers but measures neither beliefs nor the reputational concern behind each payment. Experimental aliases do not turn a person's game history into a personal credit assessment. These limitations are especially relevant when a teacher invites students to explain a particular participant's choice.

Theoretical foundation

Separate three questions: how much does the borrower gain today by retaining payment, which future finance could be lost, and can the bank identify that behavior when deciding again? Answers require payoffs, horizon and information permissions. Repetition without linked records is different from a relationship with bilateral memory.

The bank needs an adequate expectation of collection. If expected full-payment probability is q , reference expected collection is $120q$ and profit is $120q - 100$. Breaking even requires $q \geq 5/6$, approximately eighty-three percent. At $q = 0.8$, the bank loses four even though four out of five loans are fully paid. This is an account conditional on a belief rather than a probability inferred from a small class or an automatic lending rule implemented by the software. Students can use it to distinguish frequent repayment from a financially sustainable contract.

2.3 An intertemporal calculation and its limit

To organize intuition, imagine a different setting: certain income, indefinite continuation with probability δ , and permanent exclusion from credit after nonpayment. Repeated compliance with the promise of one hundred twenty provides a borrower rent of seventy-two per round over no credit. Expected future rents equal $\delta 72 / (1 - \delta)$. Paying today preserves that value and costs one hundred twenty compared with retention. The illustrative condition is $\delta 72 / (1 - \delta) \geq 120$, or $\delta \geq 0.625$. It identifies a possible incentive under a specified strategy rather than establishing that all players will adopt it.

At ninety-percent continuation, hypothetical future value is six hundred forty-eight, above the immediate temptation. Raising outside income to forty reduces the financed rent to forty and raises the threshold to 0.75. Losing access hurts less when alternatives improve. This does not prove exclusion is credible, everyone follows that strategy or cooperation is the only equilibrium. It also requires a link between behavior and later contracts. Shared history can supply that link across lenders, while bilateral memory supplies it only within a particular relationship.

This application's random extension has an announced maximum of twenty rounds. Each closing applies ninety-percent continuation, but round twenty always ends the episode. It therefore has a capped random horizon rather than an infinite one. The cap can restore backward induction under complete monetary assumptions. The report labels the threshold as a hypothetical indefinite reference and does not classify real decisions as correct or incorrect by it. Evidence on random continuation motivates the comparison (Dal Bó, 2005); the operational rule remains an explicit classroom adaptation with a different horizon.

Maintain the episode sum whether play ends after one round or reaches twenty. Do not compensate early termination by selecting other outcomes, adding discretionary rounds or changing to an average. Such changes alter the rule participants knew when deciding. When comparing sessions of different lengths, describe the draw first and report rates per opportunity or per-round outcomes alongside total payoff. A larger total may simply reflect more rounds rather than improved access or repayment. The distinction matters both for classroom feedback and for interpreting an exported total without its duration.

2.4 History, income losses and welfare

A history communicates facts under specified permissions. A bank may see only its previous contracts with a borrower or consult a shared register. Both contain earlier settled rounds. Missing records may mean no loan occurred, another bank financed it, information is delayed or a record left the visible window. Absence is neither default nor evidence of a bad type. In the noisy register a label may also disagree with actual payment. Interpreting histories requires knowing their source and coverage before computing any apparent repayment frequency.

A genuine income loss introduces a separate interpretation problem. At zero income with protected personal wealth, the borrower cannot pay from production and has no available voluntary amount. At income two hundred, retaining a debt of one hundred twenty creates a voluntary shortfall. Observable-income conditions reveal income to the bank; private-income conditions do not, although the instructor retains it for analysis. The bank sees collection but receives neither a private intention label nor an automatic explanation that a shortfall was bad luck. Its decision problem is therefore different across the two conditions.

Joint loan wealth equals endowments minus investment plus income minus correction and switching costs. Collection cancels when summed because it transfers resources between roles. Institutional costs are consumed resources in the design rather than transfers to the lender. Without a loan, add outside income and subtract any requested correction charge. For random income, calculate expected production before recommending financing: more lending is not necessarily efficient under every configurable distribution. This account prevents a privately attractive repayment rule from being described as additional productive surplus.

Information-sharing and relationship-lending references (Brown and Zehnder, 2007; Padilla and Pagano, 2000; Fehr and Zehnder, 2009) motivate comparisons; numerical parameters are original. Sharing can extend consequences across banks, spread errors and alter opportunities. Competition can improve terms while changing the rent from continuity. Reconstruct each channel from effective rules and distinguish description from effects identified by assignment.

Extensions: information, continuity and institutions

3.1 Choosing a comparison

The extended edition contains a bilateral reference and sixteen useful changes. Each condition keeps its rules for ten rounds except probabilistic continuation capped at twenty. The shared sequence is offer, application, income, payment and outcome. Numerical values are an original teaching adaptation. References motivate mechanisms and related evidence rather than supplying the application's probabilities, costs or accounts. Two translated interfaces are not independent observations, and switching language should never be described as an experimental treatment.

Start from a narrow question. To study portable information, compare rematching without history with a shared register. To study accuracy, retain that register and add errors or correction. For shocks, compare observable and private income under the same distribution. For competition, use the four-person market as the unit and retain its capacity rules. Combining institutions may enrich discussion without identifying which caused changed choices. Configurations provide specified comparisons rather than permission to modify rules during an already open session.

3.2 Rematching with bilateral memory and a shared register

Bilateral memory retains aliases and permits inspection only of earlier loans between that bank and borrower. Partners are randomly rematched and may recur. A new bank receives no history from other relationships. Compare this with basic rematching, which displays neither persistent counterpart aliases nor records, and with fixed pairs, where all contracts involve the same bank. Relationship duration differs from elapsed game rounds: a person can have played several rounds without having received any funded loan from the present counterpart.

The shared register retains rematching and displays earlier loans with any bank. Information follows the borrower and can extend consequences of nonpayment beyond a pair. It reveals neither current-round decisions nor a hidden true type. This comparison draws directly on [Brown and Zehnder \(2007\)](#): information sharing may discipline payment when bilateral interaction is insufficient. Their study finds a smaller reporting effect when relationships can already form. That evidence motivates a classroom contrast rather than guaranteeing its outcome or turning observed subsequent access into a causal probability of receiving future credit.



Open a loan offer

Round 2 · Lender

Round endowment (ECU): 120
Loan invested in the project (ECU): 100
Total promised payment (ECU): 120

Permitted history before offering

Borrower A

Round	Total promised payment (ECU)	Recorded status
1	120	Full payment

Open the offer?

- ☐ Yes
☐ No

Continue

Figure 3.1: Actual bilateral memory before a new offer.



Open a loan offer

Round 2 · Lender

Round endowment (ECU): 120
Loan invested in the project (ECU): 100
Total promised payment (ECU): 120

Permitted history before offering

Borrower A

No previous records are available for this counterpart. No record does not mean nonpayment.

Borrower B

Round	Total promised payment (ECU)	Recorded status
1	120	Incomplete payment

Open the offer?

- ☐ Yes
☐ No

Continue

Figure 3.2: Shared reporting displays both counterparts' histories.

3.3 Register errors and requested correction

One condition switches full and incomplete labels with twenty-percent probability for each loan. Errors are fixed at settlement and persist: reloading does not redraw them. Both directions are possible. A record may show nonpayment after payment or payment after retention. The bank knows the error probability but does not receive the true status from that register. The experiment does not erase a participating banker's memory of direct experience, which may sometimes conflict with the displayed shared label.

Correction uses the same error mechanism and adds a stage before later-round offers. Borrowers see actual payments beside registered labels. With outstanding errors, they may request correction of all of them for two ECU that round. This charge comes from endowment even without a new loan. With no errors, there is no empty request or charge for continuing. Correction precedes lender consultation; new records may contain new errors. Compare requests, remaining errors, access and costs. The contrast illustrates information quality and repair without representing the procedure as a particular real-world legal regime or estimating the value of an actual credit dispute.



Review the shared record

Round	Actual status of your payment	Recorded status	Corrected
1	Full payment	Full payment	Not corrected
2	Full payment	Incomplete payment	Not corrected

Request correction of all your erroneous records for 2 ECU this round?

☐ Yes

☐ No

Continue

Figure 3.3: The borrower compares true payment and label and may request correction.

3.4 Delayed information and three-round memory

Delayed reporting omits the immediately preceding round. Before deciding in round three, a bank may consult round one but not yet round two. Data are late rather than false. That distinction matters because behavior can change before its consequences become visible. Initial absence means neither universal repayment nor universal new entry. The instructor's private report retains actual decisions so narrower participant permissions can be interpreted without replacing missing records with assumed repayment outcomes.

Limited memory displays loans only from the previous three calendar rounds. It is not a window of three loans: several unfunded rounds can empty the visible record despite earlier payments. Audit data remain stored; only decision visibility changes. These conditions discuss freshness, forgetting and discipline within information-sharing mechanisms (Padilla and Pagano, 2000), rather than



Open a loan offer

Round 3 · Lender

Round endowment (ECU): 120
Loan invested in the project (ECU): 100
Total promised payment (ECU): 120

Permitted history before offering

Borrower A

Round	Total promised payment (ECU)	Recorded status
1	120	Full payment
2	120	Full payment

Open the offer?

- ☐ Yes
☐ No

Continue

Figure 3.4: The bank consults records after correction.

replicating a record-expiry law. Ask which observations were available for a specific offer before assigning differences in lending to memory, punishment or forgiveness. The same observed offer can follow different available histories under the two conditions.

3.5 Observable and private income losses

Two conditions yield zero income with probability twenty-five percent and two hundred with seventy-five percent. There is no project or effort decision changing these probabilities. Borrowers see income before payment. At zero, available payment is zero and the screen acknowledges the outcome without inventing a voluntary choice. The sixty-unit personal endowment remains protected. Data mark insufficient income rather than voluntary shortfall when no capacity was left. Thus incomplete payment alone cannot identify which incentive or resource constraint mattered.

The main difference concerns bank information. Observable conditions reveal realized income in results and permitted histories. Private conditions reveal the distribution and collection, but not the realization. Instructors can distinguish resource shortage from retention privately and should not project that distinction while private-income decisions remain open. Compare subsequent access after incomplete payment and ask which information identifies its source. This design holds the repayment problem fixed while adding productive noise; it does not reproduce the risk-choice channel studied by [Fehr and Zehnder \(2009\)](#), an additional mechanism in their research rather than an action included here.



Income and payment

Round 4 · Borrower

Total promised payment (ECU)	120
Project income (ECU)	0,0
Automatic collection (ECU)	0,0
Additional voluntary payment (ECU)	0
Correction fee (ECU)	0,0
Switching cost (ECU)	0

Income permits no additional payment. Continue to record this result.

Continue

Figure 3.5: Zero income leaves no available voluntary payment.

3.6 Probabilistic continuation with an announced maximum

Continuation is applied at round closure after everyone has decided. The probability of another round is ninety percent, with a common announced maximum of twenty. Nobody sees the draw



Round outcome

Round 4 · Lender

Closing wealth (ECU)	20.00
Funded loan	Yes
Project income (ECU)	0.00
Collection received (ECU)	0.00
Lender profit (ECU)	-100.00

Continue

Figure 3.6: The bank may observe realized income in this condition.



Round outcome

Round 1 · Lender

Closing wealth (ECU)	20.00
Funded loan	Yes
Collection received (ECU)	0.00
Lender profit (ECU)	-100.00

Continue

Figure 3.7: The bank's private settlement keeps income hidden.

in advance. When the episode ends, the final screen reports rounds played and their sum. The database is not reset, and a different round is not selected to replace a short episode. Everyone in the session faces the same stopping outcome, preserving synchronization and the common opportunity to continue.

The contrast examines anticipated future interaction with an explicit operational constraint. Do not call it an infinite-horizon game. A known cap leaves a final round if reached and may matter from the beginning through backward induction. Dal Bó (2005) provides random-continuation evidence in another paradigm; this adapts the idea to lending and declares truncation. Compare rates per opportunity and trajectories alongside total payoffs because sessions may differ in duration by chance. Realized duration is neither a borrower choice nor evidence that a relationship was more trustworthy or intrinsically more stable.



The activity has ended

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

Economic rounds played	1
Total episode closing wealth (ECU)	140.00

Figure 3.8: A real episode ends under continuation and displays duration.

3.7 Enforcement of half or all payment

Partial enforcement automatically collects half the promise, limited by income. With debt one hundred twenty and income two hundred, sixty transfers even if the borrower declines the additional amount. Another sixty may be paid or retained. This reduces immediate monetary temptation without eliminating it. A bank expecting only minimum collection recovers sixty against one hundred lent and still loses forty. The presence of enforcement alone therefore establishes neither profitable lending nor adequate voluntary incentives to complete the obligation.

Full enforcement collects all required available payment. At income two hundred, one hundred twenty transfers with no additional choice; this is not a voluntary decision to comply. With insufficient income, collection remains limited by production and excludes protected personal wealth. Compare access and wealth alongside the automatic component. The simplification isolates compulsory payment from relational discipline. Fehr and Zehnder (2009) directly studies enforcement and reputation, but their experiment also permits risk changes. This family excludes that choice and does not automatically assign enforcement all of their efficiency effects or claim to replicate their complete design.

3.8 Two banks: private memory or shared history

Competition uses two lenders and two borrowers in a stable market. Each bank may open an offer and fund one loan; each borrower applies to at most one. If both apply to one bank, a lottery allocates its single slot. An unsuccessful applicant cannot change applications that round.



Income and payment

Round 1 · Borrower

Total promised payment (ECU)	120
Project income (ECU)	200,0
Automatic collection (ECU)	60,0
Additional voluntary payment (ECU)	60,0
Correction fee (ECU)	0,0
Switching cost (ECU)	0

Choosing Yes transfers that amount to the lender. Choosing No keeps that amount for you.

Pay the additional voluntary amount shown?

☐ Yes

☐ No

Continue

Figure 3.9: Automatic collection and the additional amount are separated.



Income and payment

Round 1 · Borrower

Total promised payment (ECU)	120
Project income (ECU)	200,0
Automatic collection (ECU)	120
Additional voluntary payment (ECU)	0
Correction fee (ECU)	0,0
Switching cost (ECU)	0

The rule automatically collects the full required available amount. There is no additional payment decision.

Continue

Figure 3.10: Full enforcement creates no artificial additional choice.

An application without funding is neither rejection, incomplete payment nor a productive loss. Preserve this category when interpreting access instead of assuming every willing borrower obtained an available contract.

Private memory lets each bank see only its own previous loans with each borrower. Shared history permits consultation of all earlier loans. Both retain participant counts, capacity and the reference promise. Compared with pairs, the counterpart set and possibility of losing a slot also change. The curricular question separates portable information from endogenous continuity: receiving credit from the same bank may reflect choice, availability and allocation. Relationship and information mechanisms (Brown and Zehnder, 2007; Petersen and Rajan, 1994) motivate the comparison without making this reduced market a replication of a banking system or giving relationship duration a single interpretation.



Review offers

Round 1 · Borrower

Round endowment (ECU): 60

Lender	Open the offer?	Total promised payment (ECU)
Lender A	Yes	120
Lender B	Yes	120

Choose an offer or continue without a loan

- ☐ Continue without a loan
☐ Lender A · 120 ECU
☐ Lender B · 120 ECU

Continue

Figure 3.11: Each borrower applies to one offer; each bank has one slot.

3.9 Switching banks, changing promises and improving the outside option

Switching cost adds eight ECU to the shared-history market. It is charged only when a funded loan comes from a different bank than the borrower's last funding lender. The first loan is free. An unfunded round does not erase that lender, although it breaks the duration of a consecutive funded sequence. The offer table displays the applicable charge before choice; settlement subtracts it from the borrower without adding it to the bank. Compare funded switches, access and surplus rather than persistence alone.

Flexible promises let the bank choose one hundred through one hundred eighty in steps of ten, holding loan principal at one hundred and income at two hundred. A higher promise can raise returns when paid, reduce the borrower's rent from continuation and increase the gain from retention. A higher contractual rate therefore need not improve discipline. Observe offers, applications and



Income and payment

Round 1 · Borrower

No project was financed for you this round.

Your application did not receive the lender's slot. No other contract is funded this round.

Continue

Figure 3.12: An application without a slot is not nonpayment.

collection separately. High outside income raises unfunded income from eight to forty with other parameters unchanged. Repaid finance remains attractive but its advantage over no credit shrinks.

These three extensions distinguish mobility, contractual division and outside opportunities. Observed lending relationships can be valuable (Petersen and Rajan, 1994), yet persistence does not automatically establish welfare: an exit cost can retain a counterpart even when another option would be preferred without it. Ask for a conditional recommendation with accounts and assumptions. The comparison does not by itself identify market power, discrimination or credit access in an actual population, and it provides no recommendation about an individual's real financial contract. Its purpose is to clarify mechanisms under rules students can inspect.



Review offers

Round 2 · Borrower

Round endowment (ECU): 60

Lender	Open the offer?	Total promised payment (ECU)	Switching cost (ECU)
Lender B	Yes	120	0
Lender A	Yes	120	8

Choose an offer or continue without a loan

- ☐ Continue without a loan
- ☐ Lender B · 120 ECU
- ☐ Lender A · 120 ECU

Continue

Figure 3.13: Applicable switching costs are known before choosing a bank.



Open a loan offer

Round 1 · Lender

Round endowment (ECU): 120
Loan invested in the project (ECU): 100

Permitted history before offering

Borrower A

No previous records are available for this counterpart. No record does not mean nonpayment.

Open the offer?

- ☐ Yes
☐ No

The lender chooses a promise from 100 to 180 ECU in steps of 10. It includes principal, which is not added again on collection.

Total promised payment (ECU)

120

Continue

Figure 3.14: The promise may change while principal stays fixed.

Running the session and analyzing its report

4.1 What each participant sees

Checkpoint

Check language, edition, treatment and group size before class. Use distinct participant links and visit both roles. Competition requires four people per market. Also check that an empty report distinguishes absent data and that downloads belong to the selected session rather than combining unrelated classes.

Welcome presents the laboratory and general rules. Instructions explain ECU, endowments, outside income, invested principal and payment. The resource box contains effective treatment quantities rather than a universal amount. Comprehension checks that principal is not added to cash again, unfunded wealth, what debt includes and when income becomes known. Incorrect answers retain entered fields and show explanations. Allow correction without a monetary penalty and without announcing how a contract ought to be paid. Understanding the accounting rule is separate from choosing a lending or repayment strategy.

The session synchronizes before offers so everyone has closed the preceding round. This prevents a shared history from depending on browser speed. With correction, borrowers first inspect records and decide whether to request repair while banks wait. Only then are permitted histories and offers displayed. Nobody can consult a payment still being decided in the current round. An alias links game records rather than identifying a student by name, number or classroom seat. Instructors should preserve that distinction when discussing an individual-looking sequence in a projected aggregate report.

The bank opens or closes its offer and, in flexible conditions, chooses the promise. Borrowers compare terms and select one offer or continue without a loan. Competition allocates slots after all applications. The next screen states funding and income. If additional payment exists, it offers transfer or retention; full enforcement or absent income is acknowledged without fabricating a choice. Results separate wealth and relevant payment components by role. Bank screens obey income permissions even though the instructor can inspect more complete records privately.

Everyone confirms results before common closure. Under random continuation, closure applies the draw and determines another round. The program announces neither a future draw before decisions nor inactive future rounds as missing interactions. Final closure reports economic duration and the episode sum. If a pair waits, inspect its counterpart's stage before creating another session. Restarting the application or distributing new links can abandon still-valid decisions. A waiting

page is a synchronization state rather than evidence that a participant has lost the loan or received a zero payoff.



Loans and payments

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 the rules.

- ☐ Yes
☐ No

Start

Figure 4.1: Welcome and agreement to rules.

4.2 Progress and revelation with explicit denominators

The private instructor report starts with progress: participants, settled markets, pending markets in opened rounds, offers, applications and recorded payments. It does not assume that every technical database round was played. A new session may have no opened round; a partial session may have one settled market while another waits. Rates are not constructed by filling pending decisions with zero. Revelation displays or hides aggregates without deleting information. State coverage before projecting behavior so students know what portion of the episode the report describes.

Funded loans over applications measures allocation among those selecting an offer rather than total demand or acceptance among all students. Rejection and absent offers are excluded. Full payment uses settled loans. Voluntary shortfall uses loans with positive payment capacity; zero income permits no additional voluntary decision. Insufficient income uses all loans. Percentages without their bases can confuse closed credit with perfect repayment. In particular, an unavailable payment rate in a session with no loans is different from zero percent and from one hundred percent.

Continuity compares the current bank with each borrower's last funded lender and excludes borrowers without a prior loan. It may span an unfunded round. Link duration instead counts consecutive funded loans with the same bank and breaks after an unfunded round or a switch. Sequences still open are censored by observation closure. Do not call them the total duration of a relationship beyond the laboratory. Preserve this distinction when discussing persistence under switching costs or comparing a long calendar episode with a short run of financed interactions.



Instructions

Resources and unit of account

Each round the lender receives 120 ECU and the borrower 60 ECU. Resources renew and do not accumulate to finance future rounds.

A loan of 100 ECU enters the project directly rather than personal cash. Without finance, the borrower keeps the endowment and earns an additional 8 ECU; the lender keeps its endowment.

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

This session does not convert ECU into real money.

Figure 4.2: Lender resources and rules.

Your role: **Lender**

- The lender opens or closes the offer; the borrower sees it and may reject it. After receiving income, the borrower decides the additional payment allowed by the rule.
- With finance, the project yields 200 ECU with probability 100% and 0 ECU with probability 0%. The borrower knows income before deciding payment.
- Automatic collection is 0% of the promise, limited by income. The borrower may voluntarily transfer the remaining available amount up to the debt. Personal endowment does not secure the loan.
- The episode result sums closing wealth over all rounds played. It neither selects a single round nor uses their average.
- Number of rounds, announced in advance: 1.
- Your role and counterpart remain the same throughout the episode.
- The lender sees only that borrower's prior payments to the same lender. Experimental aliases do not identify real people.
- The promise is 120 ECU including principal. The lender decides whether to offer but cannot change this amount.

Continue

Figure 4.3: Lender rules continued.



Instructions

Resources and unit of account

Each round the lender receives 120 ECU and the borrower 60 ECU. Resources renew and do not accumulate to finance future rounds.

A loan of 100 ECU enters the project directly rather than personal cash. Without finance, the borrower keeps the endowment and earns an additional 8 ECU; the lender keeps its endowment.

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

This session does not convert ECU into real money.

Figure 4.4: Borrower resources and rules.

Your role: **Borrower**

- The lender opens or closes the offer; the borrower sees it and may reject it. After receiving income, the borrower decides the additional payment allowed by the rule.
- With finance, the project yields 200 ECU with probability 100% and 0 ECU with probability 0%. The borrower knows income before deciding payment.
- Automatic collection is 0% of the promise, limited by income. The borrower may voluntarily transfer the remaining available amount up to the debt. Personal endowment does not secure the loan.
- The episode result sums closing wealth over all rounds played. It neither selects a single round nor uses their average.
- Number of rounds, announced in advance: 1.
- Your role and counterpart remain the same throughout the episode.
- The lender sees only that borrower's prior payments to the same lender. Experimental aliases do not identify real people.
- The promise is 120 ECU including principal. The lender decides whether to offer but cannot change this amount.

Continue

Figure 4.5: Borrower rules 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.

Is principal added to your personal cash as well as invested?

☒ Yes

☐ No

Your answer: Yes. The correct answer is No. No. The loan is invested directly; adding it again would duplicate resources.

How many ECU does an unfunded borrower finish with in this session, with no correction fees?

0

Your answer: 0. The correct answer is 68. Without a loan, endowment plus outside income is $60+8=68$ ECU.

Example: income 200, debt 120 and no automatic collection. How much transfers if full payment is chosen?

220

Your answer: 220. The correct answer is 120. Total debt is 120 ECU and already includes principal. Full payment transfers 120 rather than 220.

Is additional payment chosen before or after seeing income?

☒ Before seeing income

☐ After seeing income

Your answer: Before seeing income. The correct answer is After seeing income. The borrower knows income before choosing additional payment.

Continue

Figure 4.6: Explained errors with submitted answers retained.



Open a loan offer

Round 1 · Lender

Round endowment (ECU): 120
Loan invested in the project (ECU): 100
Total promised payment (ECU): 120

Permitted history before offering

Borrower A

No previous records are available for this counterpart. No record does not mean nonpayment.

Open the offer?

- ☐ Yes
☐ No

Continue

Figure 4.7: The lender decides whether to open finance.

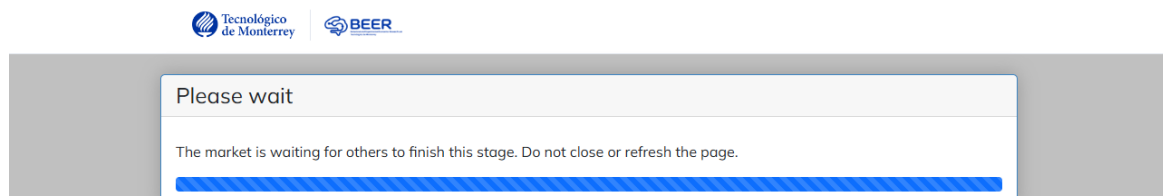


Figure 4.8: Waiting synchronizes actual decisions.



Review offers

Round 1 · Borrower

Round endowment (ECU): 60

Lender	Open the offer?	Total promised payment (ECU)
Lender A	Yes	120

Choose an offer or continue without a loan

- ☐ Continue without a loan
☐ Lender A · 120 ECU

Continue

Figure 4.9: Application precedes income.



Income and payment

Round 1 · Borrower

Total promised payment (ECU)	120
Project income (ECU)	200,0
Automatic collection (ECU)	0
Additional voluntary payment (ECU)	120
Correction fee (ECU)	0,0
Switching cost (ECU)	0

Choosing Yes transfers that amount to the lender. Choosing No keeps that amount for you.

Pay the additional voluntary amount shown?

- ☐ Yes
☐ No

Continue

Figure 4.10: Income is known before additional payment.



Round outcome

Round 1 · Lender

Closing wealth (ECU)	140.00
Funded loan	Yes
Collection received (ECU)	120.00
Lender profit (ECU)	20.00

Continue

Figure 4.11: Lender wealth separates collection and profit.



Round outcome

Round 1 · Borrower

Closing wealth (ECU)	140.00
Funded loan	Yes
Project income (ECU)	200.00
Automatic collection (ECU)	0.00
Additional voluntary payment (ECU)	120.00
Correction fee (ECU)	0.00
Switching cost (ECU)	0.00

Continue

Figure 4.12: Borrower accounts separate payment components.



The activity has ended

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

Economic rounds played	1
Total episode closing wealth (ECU)	140.00

Figure 4.13: Closure reports duration and the episode sum.

The subsequent-access table starts from a prior loan and looks for an observed immediately following round. Previous payment is classified as full, voluntary shortfall or insufficient income without voluntary shortfall. A pending or nonexistent next round after episode closure creates no artificial opportunity. Access after payment is descriptive: offers, choices and slots may respond jointly to history. Lower access following retention does not by itself identify a causal bank sanction. The table organizes a discussion about possible mechanisms rather than estimating an institutional effect from uncontrolled classroom transitions.

Instructor report: credit relationships and reputation

Aggregates for this session. Participant histories have narrower permissions than this private report. Do not project files containing individual codes.

Participants: 4	Settled markets: 0	Pending markets in opened rounds: 0	Offers recorded: 0
Applications recorded: 0	Payment decisions recorded: 0		
Download this session's round-level data		Download this session's wide file	

No markets have settled yet. Pending data are not replaced with zeros.

Figure 4.14: Unsettled markets do not create imputed outcomes.

4.3 Distributions, trajectories and theoretical references

The promise distribution counts open offers in settled markets. The reference contains only one hundred twenty; flexible conditions add amounts through one hundred eighty. Promises differ from collections. An offer may be rejected or receive no application, while an accepted obligation can remain incompletely paid. The duration distribution counts observed sequences rather than unique people. One person can contribute several links after interruptions or switches, so its bars should not be interpreted as the number of borrowers who have ever received credit.

The trajectory uses a solid line for funded loans over borrowers in settled markets and a dashed line for full payments over loans. Denominators differ and should be read beside round counts. A period without loans still has an access rate if markets are complete, but lacks a repayment rate. The graph omits that payment point and does not connect it as zero. With few observations,

Instructor report: credit relationships and reputation

Aggregates for this session. Participant histories have narrower permissions than this private report. Do not project files containing individual codes.

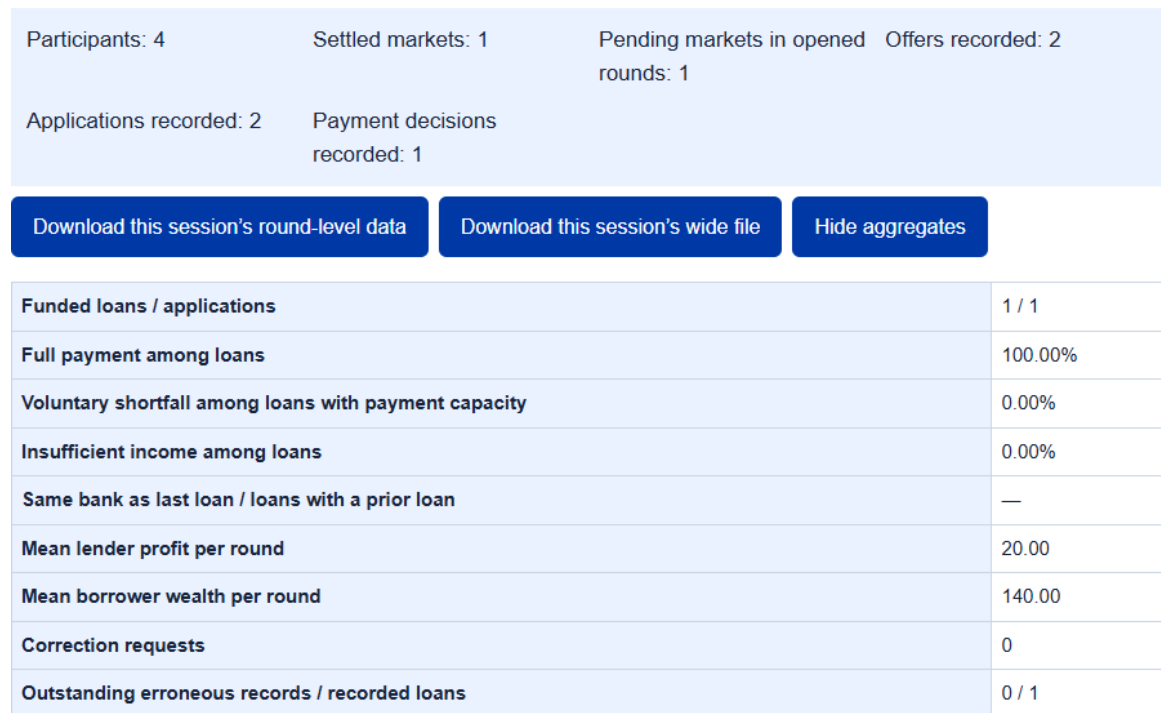


Figure 4.15: A completed market and a pending market remain distinct.

Instructor report: credit relationships and reputation

Aggregates for this session. Participant histories have narrower permissions than this private report. Do not project files containing individual codes.

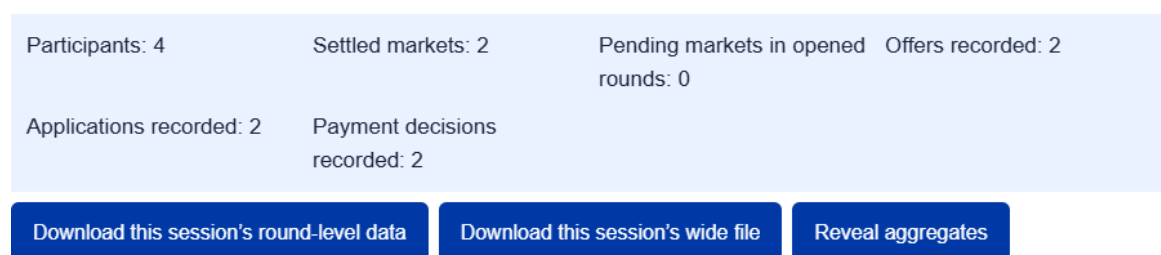


Figure 4.16: Results require explicit revelation.

Previous payment	Observed subsequent rounds	Loans in those rounds	Access (%)
Full	10	10	100.00%
Voluntary shortfall	8	8	100.00%
Insufficient income without voluntary shortfall	0	0	—

Figure 4.17: Descriptive subsequent access with observed opportunities.

a fifty-point jump may represent one decision. Colors and line styles help track series without replacing labels or the underlying table accounts.

The benchmark recalls immediate monetary incentives and the finite prediction under explicit assumptions. The indefinite-continuation threshold is hypothetical, with certain income and permanent exclusion. It describes neither the announced twenty-round cap nor a bank’s private information. The application does not estimate trust, honesty or beliefs from a rate. Ask students to name the assumption they would change to explain a departure and the evidence needed to distinguish their account from another. The theoretical reference is useful precisely because its limits can be stated alongside its calculation.

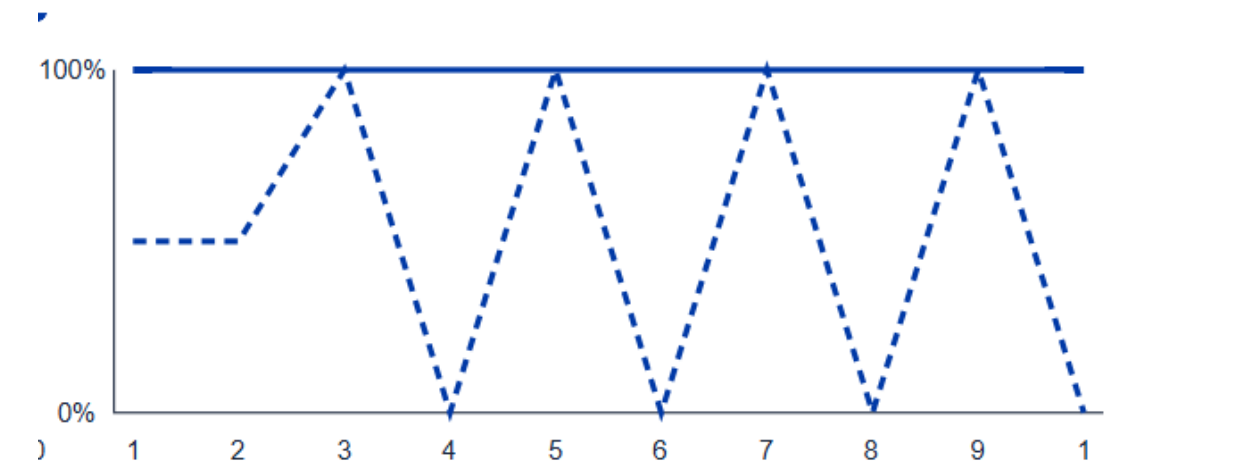


Figure 4.18: Real episode: credit solid and full payment dashed.

Round	Settled markets	Borrower	Funded loan	Full	Voluntary shortfall	Insufficient income without voluntary shortfall
1	2	2	2	1	1	0
2	2	2	2	1	1	0
3	2	2	2	2	0	0
4	2	2	2	0	2	0
5	2	2	2	2	0	0
6	2	2	2	0	2	0
7	2	2	2	2	0	0
8	2	2	2	0	2	0
9	2	2	2	2	0	0
10	2	2	2	0	2	0

Figure 4.19: Round counts accompany the trajectory.

Consecutive loans in a link	Count
10	2

Figure 4.20: Duration counts consecutive funded sequences.

4.4 Exporting every round of the session

The analytical download and native oTree wide file are scoped to the selected session code. They do not combine other classes on the same server. The analytical file keeps one row per participant and technical round, twenty per person, marked completed, pending or inactive. After one interaction with four participants, four rows are completed and seventy-six inactive. After ten completed rounds, the split is forty and forty. Random stopping changes that partition according to the number of economic rounds actually played, preserving the distinction between duration and missing responses.

Pending rows retain unsubmitted decisions as absent. Inactive rows are neither closed offers, nonpayments nor lost data. The wide file preserves columns for all twenty rounds. Filter status and role before reconstructing an episode: contract components can repeat in lender and borrower rows. Use one funded borrower row per loan when counting payments, income or record errors. Retain session, round, market and counterpart keys to prevent accidental double counting. The wider file format alone does not determine an appropriate observational unit for every question.

Reconcile closing wealth with the contract account and then compare its sum with final payoff. No penalty from another game exists here: correction and switching charges consume resources without increasing bank wealth. Random draws and individual codes are private audit data rather than projected report material. Share aggregates and remove participant links. Downloading records does not change the information banks were authorized to observe when offering; an analyst should preserve that information set when interpreting decisions instead of using later truth as though it were known in advance.

Evidence, discussion and learning assessment

5.1 What the references teach and what this class observes

[Brown and Zehnder \(2007\)](#) is the most direct experimental reference for separating bilateral relationships from shared information. In their laboratory market, information sharing raises repayment when history affects subsequent access, especially with one-shot encounters and no external enforcement. When relationships can already form, the register's additional effect is smaller. This family preserves the question while simplifying interaction so instructors can reconstruct investment, obligation and payment. It reproduces neither the full protocol nor a set of compulsory answers for students to follow.

[Fehr and Zehnder \(2009\)](#) studies reputation and enforcement alongside risk choice. Their evidence explains why enforcing repayment may interact with other incentives and why more trading need not deliver an equivalent efficiency improvement. Project risk is not chosen here; shocks are exogenous. This boundary prevents direct transfer of a result from their article. [Padilla and Pagano \(2000\)](#) provides a theoretical account of default information as borrower discipline rather than claiming that every register, error process and access rule produces identical outcomes. The classroom comparison should retain the institutional assumptions needed for the mechanism.

Observational evidence in [Petersen and Rajan \(1994\)](#) relates small-business lending relationships to financing availability and price, emphasizing access. It usefully explains why rates alone are insufficient. Those data are not this class's experimental assignment and do not identify the effect of our eight-ECU switching charge. Random-continuation evidence in [Dal Bó \(2005\)](#) concerns a different game and motivates changing expected future interaction. It does not transform a twenty-round operating cap into an infinite horizon or supply a quantitative repayment prediction for this lending application.

Use these contributions to formulate rival hypotheses. Payment may reflect future access, reciprocity, promise keeping, concern for another person or misunderstanding. Decision records alone cannot distinguish them all. The report elicits neither beliefs nor preferences and labels no student honest or dishonest. Guide captures and test records verify software operation rather than behavior in a population. Research would need its own design, incentives, consent and analysis. A classroom demonstration remains useful without being represented as an empirical replication or an estimate suitable for policy decisions.

A small class may show declining late credit or renewed access after correction. Describe what changed and how many opportunities were observed. If banks endogenously selected borrowers or students chose sessions, differences are not automatically causal effects. Even with random assignment, groups or markets are interaction units and rounds are not independent observations.

The discussion gains precision by separating description, theoretical reference and identification rather than requiring the demonstration to answer a broader empirical question. Clear limitations help students understand what experimental control contributes when it is actually part of a research design.

5.2 A teaching sequence and solved problems

Allow five minutes for the credit question, ten for rules and comprehension, fifteen or twenty for decisions and fifteen for discussion. Random continuation needs extra room. Before play, collect written predictions about the last round and about shared history. Afterwards show completed markets, applications and funded loans first. Add collection and future access only once each measure's base is understood. A class without credit still provides a relevant observation: reconstruct closed offers and rejection without imputing nonexistent repayment choices.

Feedback script

Compare paying with retaining. Who gains today, and which production has already occurred? Now identify the observation the bank may use next round. When payment is incomplete, first check whether income was available. Then discuss which relationship between payment and access the observed records actually establish.

The first problem settles a promise of one hundred twenty against income two hundred. Full payment leaves both parties with one hundred forty. Retention leaves the bank with twenty and the borrower with two hundred sixty. The sum is unchanged. Without a loan, wealth is one hundred twenty and sixty-eight. Explain why funded additional surplus is ninety-two while the borrower's immediate gain from keeping payment is one hundred twenty. These compare different alternatives and are not competing ways to measure the same quantity or evidence of an accounting inconsistency.

The second problem asks about lending when expected full-payment probability is eighty percent with zero collection otherwise. Expected collection is ninety-six and profit minus four. With compulsory collection of sixty, expected collection becomes $60 + 60q$ and covering one hundred requires $q \geq 2/3$. The third asks for the hypothetical continuation threshold with future rent seventy-two and temptation one hundred twenty: 0.625. A complete answer states permanent exclusion, certain income and an indefinite horizon; the number alone does not describe the application's capped episode or establish a unique equilibrium.

The fourth compares zero payment after zero and two hundred in income. Only the latter combines positive capacity and voluntary shortfall in the reference. The fifth inserts an unfunded round between two loans from the same bank. The last funding lender remains relevant for switching cost, but consecutive loan duration breaks. The sixth asks whether paying two to correct an erroneous record is worthwhile. There is no universal answer: it depends on the expected effect of correction on offers, applications and actual financing, as well as on the episode's remaining opportunities.

Attention

A register label is not a true type, and incomplete payment does not identify intention. No loan is not default. Experimental aliases, draws and individual records should not be used to assess students' personal reputations, financial reliability or moral character.

To assess learning, request a conditional recommendation on reporting, enforcement or mobility. Require a changed constraint, one reconciled account and evidence that could contradict the explanation. Evaluate reasoning about incentives.

Bibliography

- Brown, M., and Zehnder, C. (2007). Credit Reporting, Relationship Banking, and Loan Repayment. *Journal of Money, Credit and Banking*, 39(8), 1883–1918. <https://doi.org/10.1111/j.1538-4616.2007.00092.x>.
- Dal Bó, P. (2005). Cooperation under the Shadow of the Future: Experimental Evidence from Infinitely Repeated Games. *American Economic Review*, 95(5), 1591–1604. <https://doi.org/10.1257/000282805775014434>.
- Fehr, E., and Zehnder, C. (2009). Reputation and Credit Market Formation: How Relational Incentives and Legal Contract Enforcement Interact. *IZA Discussion Paper 4351*. <https://docs.iza.org/dp4351.pdf>.
- Padilla, A. J., and Pagano, M. (2000). Sharing default information as a borrower discipline device. *European Economic Review*, 44(10), 1951–1980. [https://doi.org/10.1016/S0014-2921\(00\)00055-6](https://doi.org/10.1016/S0014-2921(00)00055-6).
- Petersen, M. A., and Rajan, R. G. (1994). The Benefits of Lending Relationships: Evidence from Small Business Data. *Journal of Finance*, 49(1), 3–37. <https://doi.org/10.1111/j.1540-6261.1994.tb04418.x>.