The Mechanisms of Reputation in Extralegal Enforcement

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Abstract

This paper studies the mechanisms by which reputation enables a community to enforce contracts absent formal legal authority. The canonical examples of private ordering involve ethnically homogeneous communities with strong internal ties. This commonality raises the question: Are these ties necessary for successful private-ordering? Drawing on a unique dataset of anonymous and unsecured online peer-to-peer loans, this paper shows that persistent online reputation mediates several theoretically distinct economic enforcement mechanisms: Reputation encodes information about borrower type, reputation arises as an equilibrium outcome in a repeat-play cooperative strategy, and reputation acquired in non-economic contexts solves the "cold start" problem for newcomers to the community. While in the historical examples of private ordering, homogeneity and community ties play an important role in mediating these mechanisms, this paper shows that private ordering can thrive so long as another mediator—here, online reputation—is present.

Motivation and Setting

- Contracting without formal enforceability is common: Greif (1993), Bernstein (1992).
- Literature flags "reputation" as important: Bernstein (1992), Tadelis (1999), particularly online: Nosko and Tadelis (2015).
- Several accounts of underlying mechanisms underling reputation:
  - Outcome of repeated game, information, social ties.
- But relatively little empirical work to disentangle mechanisms.
  - Lack of data.
  - Difficulty linking theory to (different) testable predictions.

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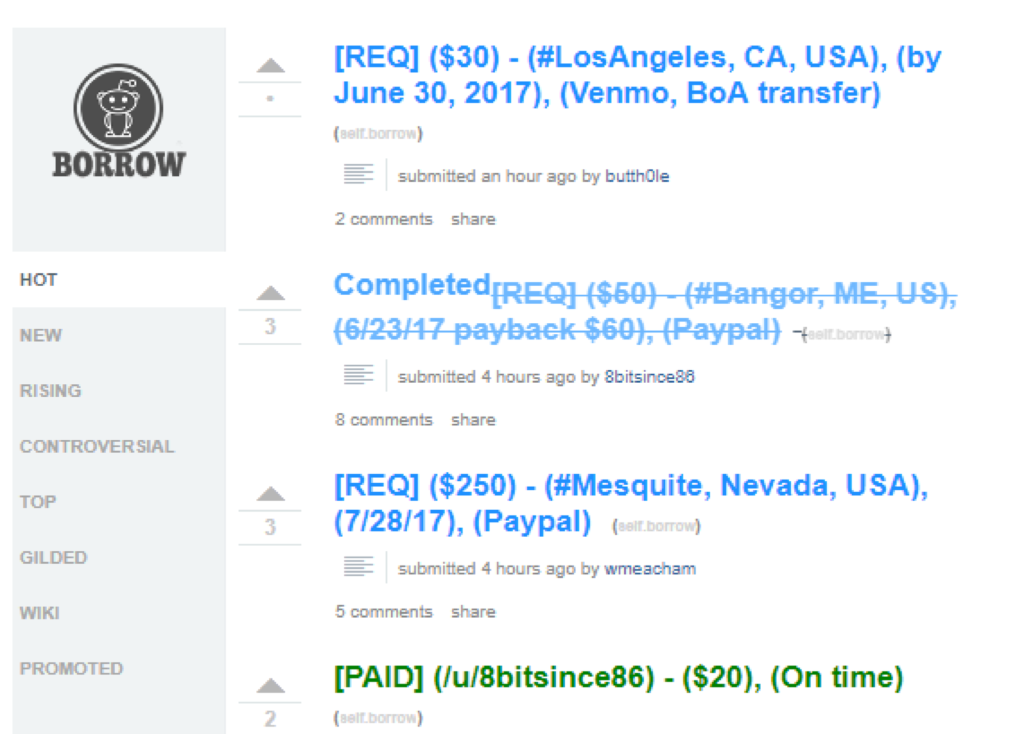
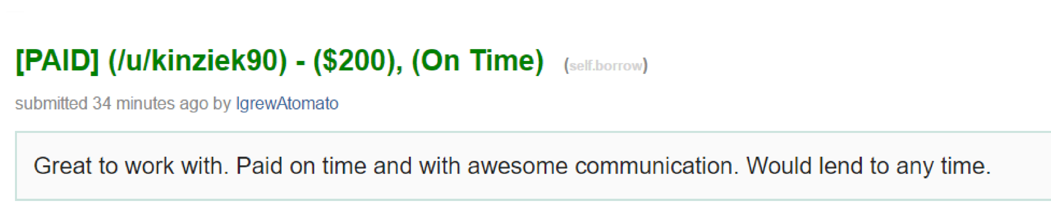
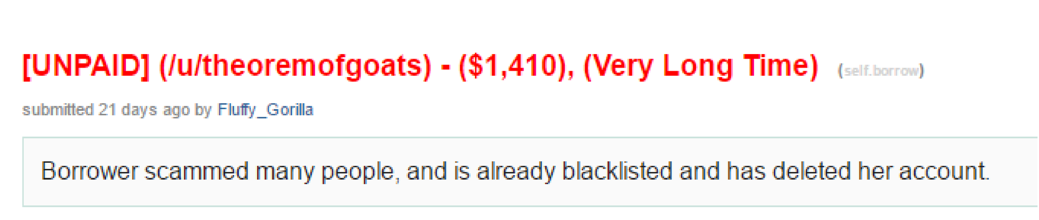
This Paper's Setting

Anonymous users post requests for short term, unsecured loans:

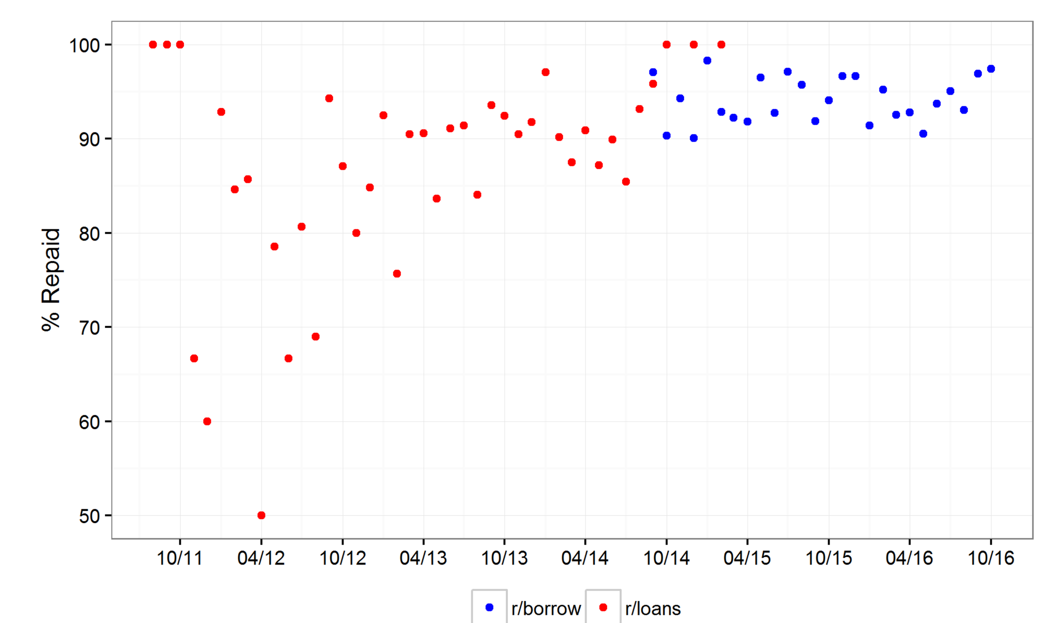


Even without formal enforceability, most loans are repaid with interest:





Repayment rates are fairly stable over time:



This paper: Use rich empirical setting to disentangle of competing economic accounts underlying the claim "reputation matters."

Objectives

1. Identify economic channel through which reputation operates:
   - Reputation is equilibrium outcome of repeated game?
   - Reputation signals value of non-social interactions?
   - Reputation provides information about persistent borrower qualities?
2. Explore counterfactuals:
   - Effect of better information environment?
   - Effect of repeat vs. non-repeat play?
   - Effect of improving formal institutions?

A Simple Model

- Unit of analysis: Lending decision.
- Lender more likely to lend if borrower more likely to repay.
- Borrowers repay if Can repay AND Choose to repay.

$$Lend_i \sim \textbf{Can repay}_i + \textbf{Chooses to repay}_i + \epsilon_i$$

Breaking Apart the Repayment Decision

$$\textbf{Chooses to repay}_i \sim \underbrace{L_i}_{\text{learning}} + \underbrace{v_i^e}_{\text{equilibrium}} + \underbrace{v_i^s}_{\text{social}} + \underbrace{f_i}_{\text{formal}} - \underbrace{c}_{\text{financial cost}}$$

1. Equilibrium Mechanism

Importance of repeat play depends on value of future access v_i^e:

$$\begin{aligned} v_i^e &= \underbrace{u}_{\text{Util if get}} \times \underbrace{\lambda_i}_{\text{Pr need}} \times \underbrace{\pi}_{\text{Pr get}} + \underbrace{\beta v_i^e}_{\text{continuation}} \\ &= \frac{u}{1-\beta} \times \underbrace{\lambda_i}_{\text{Pr need}} \times \underbrace{\pi}_{\text{Pr get}} \end{aligned}$$

Identification though variation in λ_i, probability of subsequent request:

- ML algorithm on request text: "bills" or "gas" vs. "one-time."
- Train on testing set of requests that are filled and repaid.

2. Social/Non-Monetary Mechanism

Borrowers use site for non-loan purposes: Discussing news, hobbies, etc. Two possible roles for other on-site participation in repayment decision:

1. *Social Capital*—Borrowers value (non-borrowing) community ties which they lose upon default.
   - $v_s = f(\text{on-site participation}),\ f' > 0.$
   - On-site participation: Comment quantity, quality, account age.
2. *Cold Start*—Borrowers need a way to show they aren't frauds.
   - Account creation is free but commenting/aging is costly.
   - Solves delete-and-recreate problem.
   - Only necessary for *first* borrowing.

3. Learning Mechanism

- Borrowers differ in intrinsic willingness to repay.
- E.g., some are complete frauds and will never repay; others are honest.

Measurement

- Coefficient on repayment history controlling for other mechanisms.
- Assumption: Uncontrolled for/mis-measured mechanisms uncorrelated with past repayments. (Upper bound on "learning")

4. Formal Institutions

- Money typically transferred through Paypal or Western Union.
- Western Union: Defaults unrecoverable (bad institution).
- Defaults over Paypal *may* be recoverable (good institution):
  - Lending over Paypal violates terms of service; lender will be suspended if discovered.
  - BUT lenders can claim they paid for undelivered goods.
  - This sometimes allows partial recovery of principal (not interest)

Hypotheses and Empirical Specification

1. Equilibrium Mechanism:
   - More likely to ask again → more likely to get loan.
   - Effect bigger with good reputation. (Certification or leverage).
2. Social Mechanism:
   - More social ties → more lending *regardless*. (Social capital)
   - More social ties → more lending *first time only*. (Cold start)
3. Learning Mechanism:
   - Past repayments → more lending *conditional on other mechanisms*.
4. Formal Institutions:
   - Better formal enforcement → more likely to get loan.
   - Reputation matters less with better formal enforcement.

Specification

$$Lent_i = \beta_c Can_i + \underbrace{\beta_{N_R}\mathcal{I}_{N_R>0}}_{\text{learning}} + Does_i + \mathcal{I}_{N_R>0} \times Does_i + \epsilon_i$$

$$Does = \underbrace{\beta_e\lambda_i}_{\text{equilibrium}} + \underbrace{\beta_r \log k_i}_{\text{social}} - \underbrace{\beta_f logF_i}_{\text{cost of payment}}$$

Results

	Loan Made		
	(1)	(2)	(3)
$(N_R > 0)$	37.284***[1]	23.724***	23.218***[4]
	(1.268)	(1.685)	(1.733)
λ		0.418***	0.243**[2]
	-	(0.063)	(0.097)
logPart	-	0.006	0.010**[3]
	-	(0.004)	(0.005)
PayPal	-	8.361***	11.047***[5]
	-	(1.262)	(1.595)
$(N_R > 0) \times \lambda$	-	-	0.265**[2]
	-	-	(0.130)
$(N_R > 0)\times$logPart	-	-	−0.003[3]
	-	-	(0.008)
$(N_R > 0)\times$PayPal	-	-	−6.075**[5]
	-	-	(2.370)
Other Ctrls	N	Y	Y
Time FE	N	Y	Y
Observations	9,474	9,474	9,474
R^2	0.139	0.246	0.250

Note: *p<0.1; **p<0.05; ***p<0.01

Upshots

1. Past repayment → ≈ 40% greater funding probability.
2. Equilibrium: Strong evidence that future needs predict current access and effect is stronger once certified by past repayment.
3. Social: Social ties only matter for *first* borrow—solves cold start problem, not "social capital" problem.
4. Learning: Past repayment predicts lending even conditioning on other mechanisms; Half of unconditional effect can be explained.
5. Institutions: Better formal institutions (Paypal)→ more likely to lend, and reduce impact of reputation.

Conclusions

1. Some evidence for all mechanisms.
2. Learning and equilibrium most important.
3. Social ties help with cold start.
4. Reputation is a substitute for formal institutions.
5. Reputation complements the equilibrium mechanism.

References

Bernstein, L. (1992). Opting out of the legal system: Extralegal contractual relations in the diamond industry. *The Journal of Legal Studies*, 21(1):115–157.

Greif, A. (1993). Contract enforceability and economic institutions in early trade: The maghribi traders' coalition. *The American economic review*, pages 525–548.

Nosko, C. and Tadelis, S. (2015). The limits of reputation in platform markets: An empirical analysis and field experiment. Technical report, National Bureau of Economic Research.

Tadelis, S. (1999). What's in a name? reputation as a tradeable asset. *American Economic Review*, pages 548–563.

Acknowledgements

I am indebted to Lisa Bernstein, William Hubbard for excellent guidence, and to Bill Wilhelm, participants from the 2017 Oxford Centre for Corporate Reputation Conference and the 2017 SIOE for their helpful comments and questions.