

Contract Enforcement in a Stateless Economy

Sultan Mehmood¹ and Daniel Chen²

Talk

April 2023

¹New Economic School of Moscow

²Toulouse School of Economics

Motivation

- The ability to enter into contracts is essential for economic development (Greif, 1989; North, 1991; Acemoglu et al., 2001)
- But more often than not, contract enforcement requires formal institutions such as Courts
- Markets appear to thrive without reliance on such institutions
- So, how do markets flourish in the absence of order provided by courts?

The Setting

- Illegal horse race betting market in Pakistan
- Three appealing features:
 - 1 A large informal economy:
 - USD 11 million in annual transactions
 - Annual transactions \approx auto or electronics industry in Pakistan
 - 2 Simple contracts:
 - Paying out wins by the gambling den is not an issue
 - Focus specifically on the collection of gambling debts
 - Contract enforcement = Paying back of gambling debt
 - 3 Gambling is a criminal offense
 - Gambling is illegal
 - No enforcement by Courts possible

The Questions

- In this context, we ask:
 - What sustains exchange in this informal economy?
 - How can contract enforcement be fostered in such informal settings?
- We bring descriptive and experimental evidence to these questions

This Paper

Descriptive Evidence

- Opens the “**black books**” of illegal gambling:
 - ① 70% of debt obligations are paid back in full
 - \approx the payback rate of business loans in the automobiles industry
 - ② Honor among gamblers
 - ③ Contracts enforced merely by word-of-mouth promises

This Paper

Experimental Evidence

- We oversee random assignment of betting contracts:
 - Experimentally imposing a reputational sanction increases enforcement
 - 1/3 monthly wage additionally returned by blacklisted vs control group gamblers
 - Experimentally relaxing the time to return gambling debt also matters
 - 1/4 of monthly wage additionally returned when payback time X 2
- Illegal gambling appears to thrive on the same principles of **reputation and credit constraints** that sustain modern legal markets

Related Literature and Contributions

● Informal or Shadow Economy

- Informal and illicit markets accounts for 60% of all economic activity in developing countries (La Porta and Shleifer, 2014)
- In such settings, limited court enforcement is ubiquitous (Greif, 1993; Fehr et al., 1997; Tirole, 1999; Acemoglu et al., 2001)
- Field experimental evidence on how to foster contract enforcement without threat of court enforcement

● Behavioral Economics of Addiction

- Most of the focus on alcohol, hard drugs and smoking (Schilbach, 2019; Chaloupka et al., 2019; Kremer et al., 2019)
- Test addiction models using data on actual gambling transactions

Private Ordering among Maghrebi Traders

- The paper also presents evidence for an influential hypothesis in economics:
 - “Private ordering by reputation” (Cremer, 1986; Kreps 1990; Greif, 1989; Milgrom et al., 1990; Kandori, 1992; Bernstein, 1992)
 - Greif (1989), for instance, hypothesizes contract enforcement without formal courts in a market with **personal exchange**
 - In his, game-theoretic framework, reputation-based mechanism and a threat of exclusion from the participating in the economy ensured enforcement
- We contribute to this theory to show how reputation-based sanctions may even work in markets with **impersonal exchange**
- These issues still matter because:
 - “In early stages of development, reputation-based exchanges are key for development.” (World Development Report, 2012)

Roadmap

- 1 Puzzle
- 2 Background
- 3 Experimental Details
- 4 Data
- 5 Empirical Specification
- 6 Results
- 7 Robustness
- 8 Conclusion
- 9 Appendix: Additional Robustness Checks

Puzzle

- The smooth operation of illegal gambling economy presents a puzzle:
 - 1 Impersonal exchange with limited reliance on personal relationships
 - 2 Illegal nature of the activity precludes formal court enforcement
 - 3 Acts of violence or threats of violence are virtually non-existent
- Despite these features — illegal, impersonal and non-violent — the market appears to thrive!
 - Why?

Research Questions

- 1 How are contracts enforced in this informal economy?
- 2 What sustains such contracts?
- 3 How can contract enforcement be **fostered** in this setting?

The Context

- Illegal gambling on horse races in Pakistan:
 - A large informal economy
 - Off-the-books because...
 - Gambling is a criminal offense in Pakistan
 - 2 years of imprisonment
 - BUT...
 - Ban and jail time on gambling are not strictly enforced
 - But the ban prevents contract enforcement by a formal State authority

A Gambling Station



The Bookbet

- Each betting station offers a “bookbet” contract
- You bet now but payback next week
- First timers can “bookbet” (bet on credit) amounts less than USD 15
- Overtime bookbetting can build gamblers’ “*awaz*” (literally, voice)
 - You develop a reputation to pay back your debts
 - Your *awaz* is kind of your credit-rating
 - Allows to bookbet larger amounts at a betting station overtime

Why study this market?

- Studying this economy has at least four attractive features:
 - 1 Bookbetting contracts are simple
 - Contract enforcement = Paying back of gambling debts
 - 2 Gambling is a criminal offense
 - Cuts off even threat of court enforcement
 - 3 Experimental variation in the exact contracts issued
 - Actual high-stakes bets amid randomized betting contracts
 - 4 Illegal gambling markets are immense
 - The UN Office on Crime and Drugs estimates the illegal gambling economy to be worth USD 1.7 trillion

The Market



The Experiment

Randomization by Color Coded Cards



Randomized Betting Contracts

● Control Contract (910 bettors)

- Status-quo standard “bookbet” contract (7-day payback)
- Nonpayment implies no bookbetting at that station, only “cash-in-advance” bets (bookbet at other stations still possible)
- But, loss of *awaz* at the defaulted station

● The Blacklisting Contracts (910 bettors)

- Local: Social image (455 bettors)
- Global: Social Image + Exclusion (455 bettors)

● Payment Deadline Extension Contract (910 bettors)

- Doubling time to payback (14-day payback contract)

Contracts read out and bets noted



Treatment Transcripts

- 1) Status Quo Transcript: “You can do the regular *bookbet* so the payment will have to be made next Sunday in 7 days”.

۱. "آپ باقاعدہ "بک بیٹ" کر سکتے ہیں اور رقم کی ادائیگی اگلے اتوار، یعنی "۷" دن بعد، کو کرنی ہوگی."

- 2) Global Blacklisting Transcript: “If you do not make the *bookbet* payment in 7 days, we will put your name on the notice board of this betting station and inform all other betting stations of your nonpayment leading to exclusion from bookbetting in the future”.

۲. "اگر آپ "بک بیٹ" کی رقم کی ادائیگی "۷" دن میں نہیں کرتے تو، ہم اپکا نام اس "بیٹنگ سٹیشن" پر لگا دیں گے اور باقی "بیٹنگ اسٹیشنز" کو بھی آپکی اطلاع دینگے جس سے آپ کو مستقبل میں "بک بیٹنگ" کی سہولت میسر نہیں رہے گی۔"

- 3) Local Blacklisting Transcript: “If you do not make the *bookbet* payment in 7 days, we will put your name on the notice board of this betting station and but will NOT inform all other betting stations of your nonpayment.”

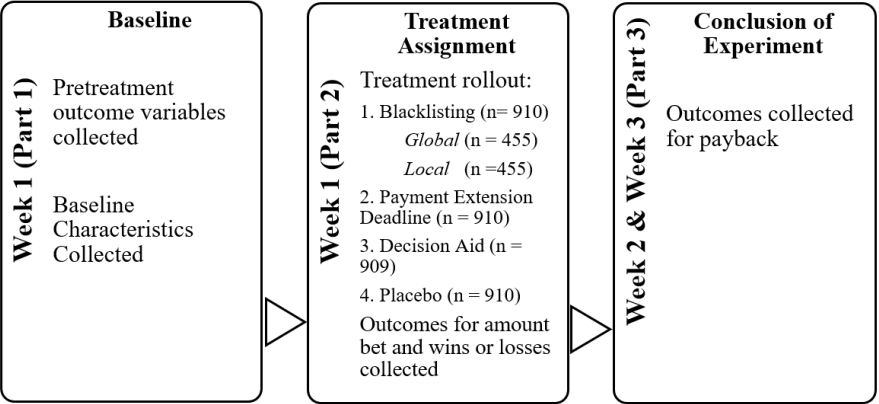
۳. "اگر آپ "۷" دن میں "بک بیٹ" کی رقم کی ادائیگی نہیں کرتے تو، ہم اپکا نام اس "بیٹنگ سٹیشن" پر لگا دیں گے مگر ہم باقی "بیٹنگ اسٹیشنز" کو آپکی اطلاع نہیں دیں گے۔"

Global versus Local Blacklisting

- The local blacklisting treatment **only** contains the social image mechanism because participation is available at other **identical** booths:
 - Social image (cf. personal honor/stigma, Benabou and Tirole 2006)
 - Economic sanction in case of non-payment is the same as control or status quo contract: no bookbetting at the station
 - This results in the economic sanction of losing your credit rating (“awaz”) at the betting station
- The global blacklisting affects social image **and** prevents individuals from bookbetting at all betting stations

The Study Design

Summarized



Blacklisting Treatment



The Data

- Betting transactions from 8598 bets
- 3639 gamblers (so 2.36 bets per gambler)
- Field data on actual payback amount, amount bet and winnings (pre-registered with a pre-analysis plan)
 - Average amount paid back: PKR 44886 (USD 189) & 70% payback
 - Our estimate of total race club bets in an year: USD 11 million
- Collect baseline data for violence: 0.5% gamblers report fearing violence
- Strategic dilemmas on risk, confidence, cooperation and coordination

Snapshot of Data



Payback in Real Time



OLS Estimation

$$Y_i = \theta + \alpha \text{GBL}_i + \beta \text{LBL}_i + \gamma \text{PDE}_i + \mathbf{W}'_i \boldsymbol{\psi} + \epsilon_i \quad (1)$$

- Subscript i denotes an individual gambler
- Y represents the respective outcome on payback, amount bet or net winnings (in PKR or standardized to mean 0 and s.d. 1)
- \mathbf{W} is a vector of individual characteristics
- Clustering is done at the individual level
- α , β and γ gives the impact of the treatments relative to the control contract

Balance

Panel A: Full Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|-----------------------------------|----------------------|---------------------|----------------------|-------------------|-----------------------|--------------------|----------------------|-----------------------|-----------------------|--------------------------|
| | Gender | Age | Muslim | Family Members | Ethnicity Punjabi | Years of Education | Employed | Own Property | Pre-treatment Payback | Pre-treatment Amount bet |
| Global Blacklisting (GB) | -0.00546 [0.0116] | 0.0153 [0.285] | 0.0170 [0.0118] | 0.287 [0.202] | 0.00365 [0.0239] | 0.213 [0.182] | 0.0117 [0.0286] | -0.000106 [0.0296] | -0.0242 [0.0269] | 638.1 [2,234] |
| Local Blacklisting (LB) | 0.00695 [0.0101] | 0.411 [0.283] | -0.00108 [0.0130] | 0.0503 [0.194] | -0.000206 [0.0239] | -0.171 [0.163] | 0.0271 [0.0283] | -0.00819 [0.0290] | -0.0407 [0.0269] | 4,219* [2,260] |
| Payment Deadline Extension (PDE) | 0.00288 [0.00867] | -0.00494 [0.223] | -0.00651 [0.0107] | 0.260* [0.157] | -0.00593 [0.0192] | -0.170 [0.143] | -0.00175 [0.0230] | -0.0257 [0.0235] | -0.00374 [0.0212] | 1,389 [1,735] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 |
| R-squared | 0.013 | 0.019 | 0.014 | 0.020 | 0.020 | 0.022 | 0.013 | 0.015 | 0.017 | 0.019 |
| F Statistics (Joint Significance) | 0.48 | 2.27 | 2.23 | 0.99 | 1.26 | 1.32 | 0.38 | 0.55 | 0.75 | 0.94 |
| Mean of dependent var | 0.967 | 35.377 | 0.952 | 7.449 | 0.794 | 11.243 | 0.614 | 0.510 | 0.705 | 29793 |

Panel B: Payback Sample

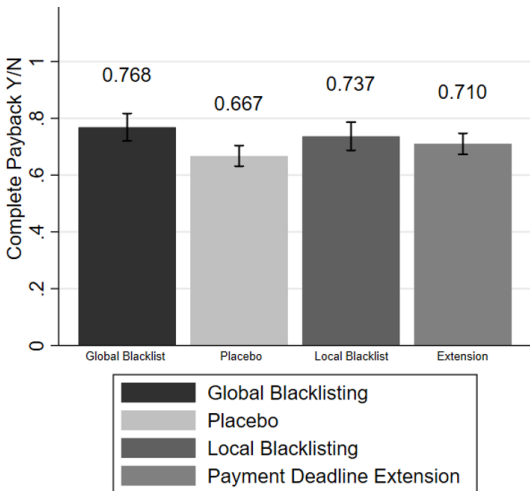
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|-----------------------------------|---------------------|--------------------|----------------------|--------------------|----------------------|--------------------|---------------------|---------------------|---------------------|------------------|
| Global Blacklisting (GB) | 0.00348 [0.0133] | 0.193 [0.347] | 0.00788 [0.0131] | 0.210 [0.245] | 0.0335 [0.0285] | 0.303 [0.224] | 0.0136 [0.0342] | -0.0226 [0.0338] | 0.0310 [0.0319] | 1,264 [2,788] |
| Local Blacklisting (LB) | 0.00582 [0.0128] | 0.351 [0.352] | -0.00790 [0.0146] | -0.0238 [0.232] | 0.0230 [0.0290] | -0.0303 [0.204] | 0.00574 [0.0345] | -0.0371 [0.0354] | 0.00946 [0.0322] | 4,369 [2,791] |
| Payment Deadline Extension (PDE) | 0.00725 [0.0106] | 0.00501 [0.270] | -0.0175 [0.0121] | 0.201 [0.194] | -0.00338 [0.0242] | -0.0566 [0.176] | -0.0213 [0.0283] | -0.0387 [0.0289] | -0.0166 [0.0266] | 595.0 [2,099] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 | 2,505 |
| R-squared | 0.025 | 0.021 | 0.025 | 0.026 | 0.030 | 0.023 | 0.019 | 0.018 | 0.027 | 0.028 |
| F Statistics (Joint Significance) | 0.38 | 1.34 | 1.03 | 0.45 | 1.15 | 0.72 | 0.40 | 0.58 | 1.72 | 0.66 |
| Mean of dependent var | 0.9685 | 35.373 | 0.956 | 7.484 | 0.787 | 11.206 | 0.621 | 0.521 | 0.689 | 29363 |

The Results

- How does payback compare across treatment and control groups?

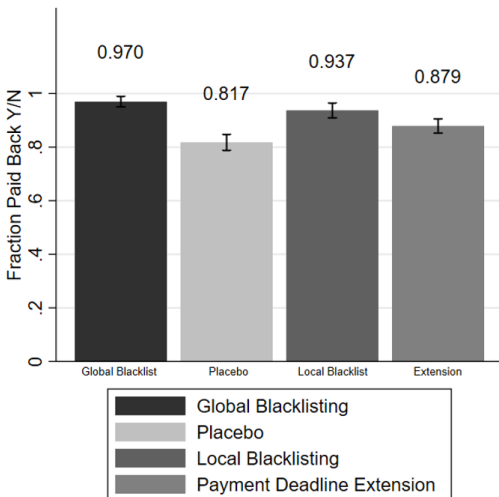
Impact on Payback

Raw Comparisons of Means



Impact on Partial Payback

Raw Comparisons of Means



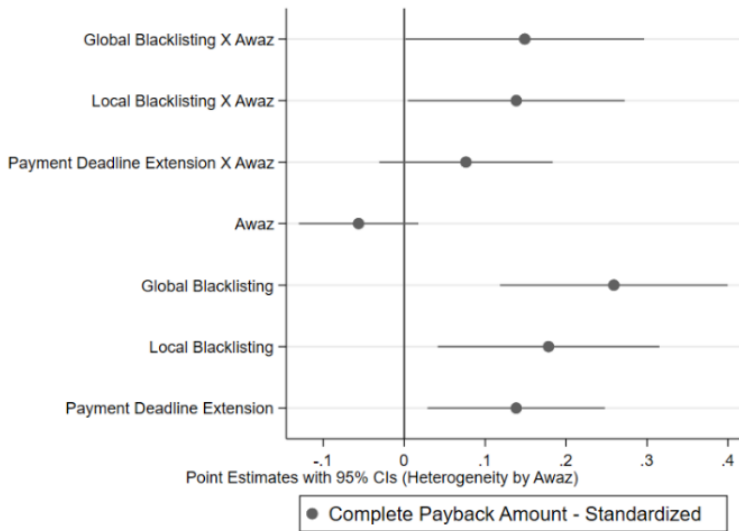
Impact on Payback at the Intensive Margin

| | (1) | (2) | (3) | (4) |
|---|--------------------------------------|-----------|---|----------|
| | <i>Complete Payback Amount (PKR)</i> | | <i>Complete Payback Amount Standardized</i> | |
| <i>Global Blacklisting (GB)</i> | 12,394*** | 12,467*** | 0.261*** | 0.263*** |
| | [3,396] | [3,398] | [0.0715] | [0.0716] |
| <i>Local Blacklisting (LB)</i> | 9,013*** | 8,892*** | 0.190*** | 0.187*** |
| | [3,305] | [3,318] | [0.0696] | [0.0699] |
| <i>Payment Deadline Extension (PDE)</i> | 6,731** | 6,569** | 0.142** | 0.138** |
| | [2,655] | [2,654] | [0.0559] | [0.0559] |
| Controls | No | Yes | No | Yes |
| Observations | 2,505 | 2,505 | 2,505 | 2,505 |
| R-squared | 0.030 | 0.033 | 0.030 | 0.033 |
| Mean of dependent var | 44886.03 | 44886.03 | 0.00 | 0.00 |
| p-value (GB = LB) | 0.397 | 0.371 | 0.397 | 0.371 |
| p-value (GB = PDE) | 0.104 | 0.090* | 0.104 | 0.090* |
| p-value (LB = PDE) | 0.501 | 0.494 | 0.501 | 0.494 |

Payback and Awaz

- Does your credit rating mediate the impact on payback?

Heterogeneity by Pre-treatment Credit Rating



Impact on Amount Bet

- How does amount bet compare across treatment and control groups?

Impact on Amount Bet

A Surprising Result

| | (1) | (2) | (3) | (4) |
|---|-------------------------|----------|----------------------------------|----------|
| | <i>Amount Bet (PKR)</i> | | <i>Amount Bet - Standardized</i> | |
| <i>Global Blacklisting (GB)</i> | 8,138*** | 8,016*** | 0.184*** | 0.182*** |
| | [2,613] | [2,617] | [0.0592] | [0.0593] |
| <i>Local Blacklisting (LB)</i> | 4,119 | 4,002 | 0.0933 | 0.0906 |
| | [2,504] | [2,502] | [0.0567] | [0.0567] |
| <i>Payment Deadline Extension (PDE)</i> | 2,676 | 2,560 | 0.0606 | 0.0580 |
| | [1,987] | [1,984] | [0.0450] | [0.0449] |
| Controls | No | Yes | No | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 |
| R-squared | 0.013 | 0.016 | 0.013 | 0.016 |
| Mean of dependent var | 55150.21 | 55150.21 | 0.00 | 0.00 |
| p-value (GB = LB) | 0.187 | 0.188 | 0.187 | 0.188 |
| p-value (GB = PDE) | 0.038** | 0.039** | 0.038** | 0.039** |

An Interpretation

- A rational addiction model would predict that the blacklisting treatment should reduce the amount bet (Becker and Murphy 1988)
 - But we find the opposite!
 - Both amount bet and payback increases
- Hoch and Loewenstein (1991)'s model of spontaneous demand
 - Consumption of addictive goods involves time inconsistency
 - Today blacklisting increases your demand
 - The global blacklisting treatment may induce a mismatch between present and future consumption of the addictive good
 - This would reconcile both gamblers betting larger amounts but also payback more
 - At the time of betting they think YOLO but return due to addiction

Impact on Winnings

| | (1) | (2) | (3) | (4) |
|---|---------------------------|------------|------------------------------------|-----------|
| | <i>Net Winnings (PKR)</i> | | <i>Net Winnings - Standardized</i> | |
| <i>Global Blacklisting (GB)</i> | -10,612*** | -10,482*** | -0.182*** | -0.180*** |
| | [3,525] | [3,533] | [0.0604] | [0.0606] |
| <i>Local Blacklisting (LB)</i> | -5,172 | -5,024 | -0.0887 | -0.0861 |
| | [3,385] | [3,383] | [0.0580] | [0.0580] |
| <i>Payment Deadline Extension (PDE)</i> | -840.9 | -728.9 | -0.0144 | -0.0125 |
| | [2,717] | [2,713] | [0.0466] | [0.0465] |
| Controls | No | Yes | No | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 |
| R-squared | 0.014 | 0.016 | 0.014 | 0.016 |
| Mean of dependent var | -35096.44 | -35096.44 | 0.000 | 0.000 |

The Bottomline

- Reputation appears to be important in this market
 - *Despite losing more, gamblers bet larger amounts and payback more often*
- Extending deadline also matters
 - *Giving gamblers more time to pay back increases, not decreases, payback!*

Alternate Mechanism: Threat of Violence

| | (1) Personal Fear of Violence | (2) | (3) Personal Getting Life Threats | (4) | (5) Heard Others Fear Violence | (6) | (7) Heard Others Getting Life Threats | (8) |
|-----------------------------------|----------------------------------|-----------------------|--------------------------------------|-----------------------|-----------------------------------|-----------------------|--|-----------------------|
| <i>Global Blacklisting</i> | 0.00359 [0.00551] | 0.00359 [0.00551] | 0.00001 [0.00305] | 0.00005 [0.00308] | -0.00669 [0.00692] | -0.00609 [0.00698] | 0.00100 [0.00581] | 0.000783 [0.00581] |
| <i>Local Blacklisting</i> | -0.00409 [0.00352] | -0.00425 [0.00354] | -0.00248 [0.00182] | -0.00258 [0.00179] | 0.00438 [0.00883] | 0.00431 [0.00876] | 0.00811 [0.00675] | 0.00843 [0.00675] |
| <i>Payment Deadline Extension</i> | -0.00261 [0.00324] | -0.00262 [0.00321] | 0.00005 [0.00228] | 0.00002 [0.00230] | -0.00213 [0.00622] | -0.00236 [0.00614] | -0.00345 [0.00370] | -0.00350 [0.00369] |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 | 3,639 |
| R-squared | 0.009 | 0.010 | 0.008 | 0.009 | 0.015 | 0.018 | 0.017 | 0.020 |
| Mean of Dep. Var | 0.007 | 0.007 | 0.002 | 0.002 | 0.021 | 0.021 | 0.009 | 0.009 |

- Only 0.5% of the control group reports fearing violence in case of renegeing on your contract

Consistent with Qualitative Work

Quote from a recent ethnography

- *“When I asked Paa’h Sadiq, a bookie and a key interlocutor, about the use of violence in his line of work, he was taken aback. Do I look like Amresh Puri? You guys see too many gangster films. Gambling debts are debts of honour. If I resort to violence, I lose honour and the [very] right to collect debts.” Mahar (2022, p. 5).*

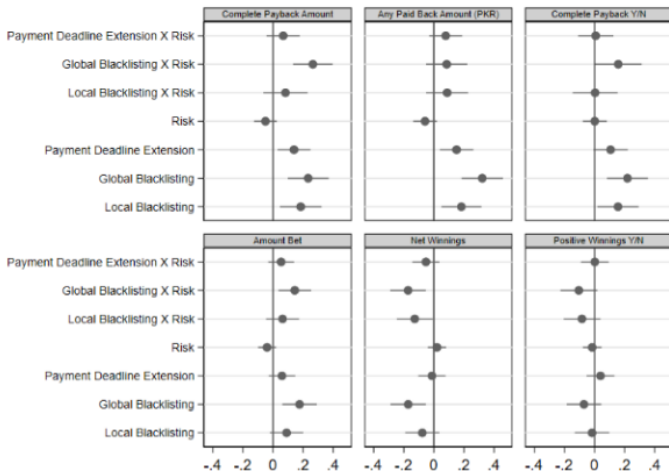
Why does reputation and payment extension matter?

- Heterogeneity analysis of pre-treatment preferences provides some clues
- We prespecified four strategic dilemmas and whether you are regular versus irregular gambler to explore heterogeneous treatment effects

Payment Deadline Extension and Regular Gamblers

- Payback rate is about 0.2 s.d. higher for regular gamblers relative to irregular gamblers
- Credit constraints appear to mediate regular gamblers' participation in this informal economy

Heterogeneity by Risk



Point Estimates with 95% CIs (Heterogeneity by Pre-Treatment Risk Preferences)

Risk and Reputation

Another surprising result

- Risky globally blacklisted gamblers pay back more, bet larger amounts, despite losing more
- One interpretation is that the risk-loving individuals enjoy the risky illegal gambling environment
- So, they are more likely to fulfill contractual obligations under the threat of blacklisting

Multiple Hypothesis Testing

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------------------|---------------------------|--------------------------------------|-------------------------|--------------------------------------|---------------------------------|---------------------------|-----------------------------------|----------------------------------|
| | <i>Net Winnings (PKR)</i> | <i>Complete Payback Amount (PKR)</i> | <i>Amount Bet (PKR)</i> | <i>Pre-Treatment Regular Gambler</i> | <i>Pre-Treatment Confidence</i> | <i>Pre-Treatment Risk</i> | <i>Pre-Treatment Coordination</i> | <i>Pre-Treatment Cooperation</i> |
| <i>Global Blacklisting</i> | -10482 | 12467.228 | 8016.340 | 0.039 | -0.030 | 0.041 | 0.019 | 0.607 |
| p-value | 0.003*** | 0.0002*** | 0.002*** | 0.129 | 0.144 | 0.090* | 0.378 | 0.930 |
| Sharpened q-value | 0.025** | 0.009*** | 0.024** | 0.299 | 0.299 | 0.277 | 0.442 | 0.643 |
| FWER p-value | 0.007*** | 0.0003*** | 0.003*** | 0.457 | 0.489 | 0.318 | 0.879 | 0.999 |
| <i>Local Blacklisting</i> | -5024.259 | 8892.479 | 4001.859 | -0.00007 | -0.032 | 0.055 | 0.011 | 9.788 |
| p-value | 0.138 | 0.007*** | 0.110 | 0.998 | 0.116 | 0.021** | 0.593 | 0.168 |
| Sharpened q-value | 0.299 | 0.044** | 0.299 | 0.643 | 0.299 | 0.084* | 0.542 | 0.327 |
| FWER p-value | 0.483 | 0.008*** | 0.394 | 0.999 | 0.410 | 0.038** | 0.969 | 0.576 |
| <i>Payment Deadline Extension</i> | -728.910 | 6569.500 | 2559.836 | 0.064 | -0.030 | 0.025 | -0.0004 | -5.173 |
| p-value | 0.788 | 0.013** | 0.197 | 0.002*** | 0.069* | 0.215 | 0.981 | 0.350 |
| Sharpened q-value | 0.607 | 0.065* | 0.364 | 0.024** | 0.227 | 0.373 | 0.643 | 0.442 |
| FWER p-value | 0.996 | 0.019** | 0.655 | 0.0003*** | 0.221 | 0.691 | 0.999 | 0.860 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 3639 | 2505 | 3639 | 3639 | 3639 | 3639 | 3639 | 3639 |

Randomization Inference

| | (1) | (2) | (3) | (4) | (5) |
|---|-------------------------------|---------------------------------------|---------------------------------------|--|-------------------------------------|
| | <i>Dummy</i> | | <i>Amount</i> | | |
| | <i>Winnings</i> | <i>Payback</i> | <i>Winnings</i> | <i>Payback</i> | <i>Bet</i> |
| <i>Global Blacklisting (GB)</i> | -0.0370 (0.175) {0.175} | 0.111 (0.0001) *** {0.0007} *** | -10,482 (0.003) *** {0.004} *** | 12,467 (0.0001) *** {0.0003} *** | 8,016 (0.002) *** {0.001} *** |
| <i>Local Blacklisting (LB)</i> | -0.0125 (0.644) {0.643} | 0.0716 (0.024) ** {0.029} ** | -5,024 (0.138) {0.146} | 8,892 (0.007) *** {0.006} *** | 4,002 (0.110) {0.119} |
| <i>Payment Deadline Extension (PDE)</i> | 0.0179 (0.417) {0.406} | 0.0489 (0.067) * {0.059} * | -728.9 (0.788) {0.795} | 6,569 (0.013) ** {0.012} ** | 2,560 (0.197) {0.206} |
| Observations | 3639 | 2505 | 3639 | 2505 | 3639 |

Attrition

| | (1) | (2) | (3) | (4) |
|---|------------------------|----------|---------------------------------|----------|
| | <i>Attrition Dummy</i> | | <i>Attrition - Standardized</i> | |
| <i>Global Blacklisting (GB)</i> | -0.0379 | -0.0370 | -0.0933 | -0.0910 |
| | [0.0273] | [0.0273] | [0.0672] | [0.0671] |
| <i>Local Blacklisting (LB)</i> | -0.0136 | -0.0125 | -0.0335 | -0.0309 |
| | [0.0271] | [0.0271] | [0.0667] | [0.0667] |
| <i>Payment Deadline Extension (PDE)</i> | 0.0176 | 0.0179 | 0.0434 | 0.0440 |
| | [0.0221] | [0.0221] | [0.0544] | [0.0543] |
| Individual Controls | No | Yes | No | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 |
| R-squared | 0.016 | 0.020 | 0.016 | 0.020 |
| Mean of dependent var | 0.312 | 0.312 | 0.000 | 0.000 |

No impact of Decision Aid

| | (1) <i>Complete Payback Amount (PKR)</i> | (2) | (3) <i>Fraction Paid Back Amount (PKR)</i> | (4) | (5) <i>Amount Bet (PKR)</i> | (6) |
|-----------------------------------|---|----------------------|---|----------------------|--------------------------------|---------------------|
| <i>Decision Aid</i> | 2,985 [2,618] | 3,057 [2,628] | 1,737 [2,214] | 1,764 [2,213] | 2,295 [2,038] | 2,233 [2,044] |
| <i>Global Blacklisting</i> | 12,394*** [3,396] | 12,467*** [3,398] | 12,792*** [2,784] | 12,741*** [2,782] | 8,138*** [2,613] | 8,016*** [2,617] |
| <i>Local Blacklisting</i> | 9,013*** [3,305] | 8,892*** [3,318] | 7,395*** [2,662] | 7,313*** [2,664] | 4,119 [2,504] | 4,002 [2,502] |
| <i>Payment Deadline Extension</i> | 6,731** [2,655] | 6,569** [2,654] | 6,019*** [2,237] | 5,918*** [2,235] | 2,676 [1,987] | 2,560 [1,984] |
| Controls | No | Yes | No | Yes | No | Yes |
| Observations | 2,505 | 2,505 | 2,505 | 2,505 | 3,639 | 3,639 |
| R-squared | 0.030 | 0.033 | 0.030 | 0.035 | 0.013 | 0.016 |
| Mean of dependent var | 44886.03 | 44886.03 | 43268.19 | 43268.19 | 55150.21 | 55150.21 |

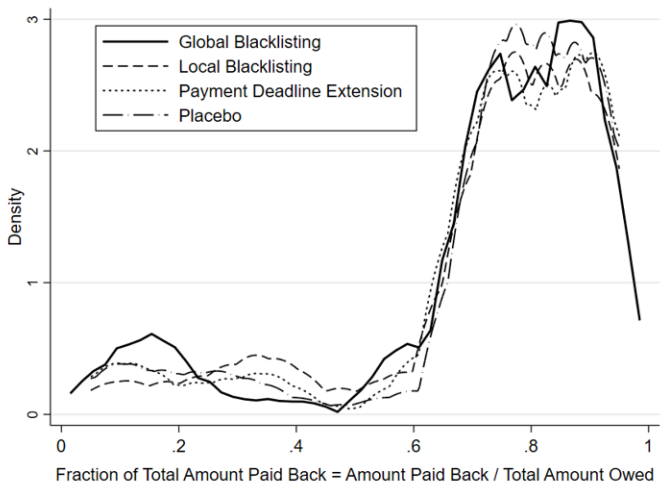
Conclusion

- Much of the world relies on informal markets:
 - What makes such environments self-sustaining?
 - What drives decision-making in such economies?
- We provide data and experimental evidence that contract enforcement is possible without threat of court enforcement
- The illicit gambling market appears thrive on the same principles of reputation and credit constraints that sustain modern legal markets

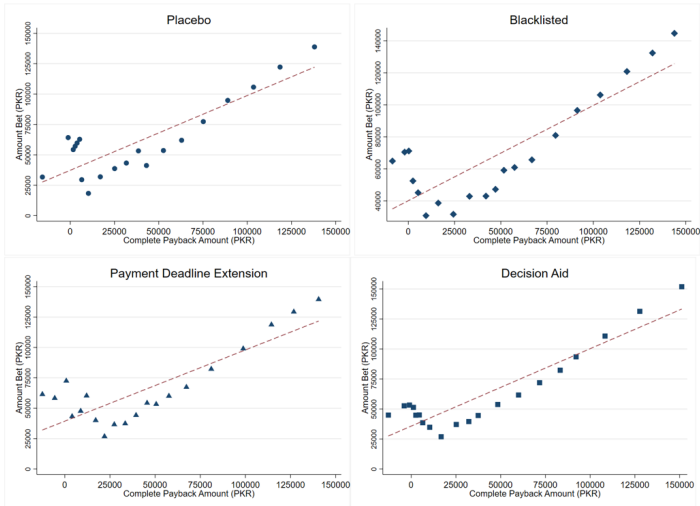
Thank You for Your Attention

“I would be more than willing to go back into penal servitude for as many years as I spent there before, just to pay my debts and feel a free man again.” Fyodor Dostoevsky, Letter, Petersburg, April 14, 1865, in: Selected Letters (1987) 210.

Distributions of Fraction of Total Owed Amount Paid Back



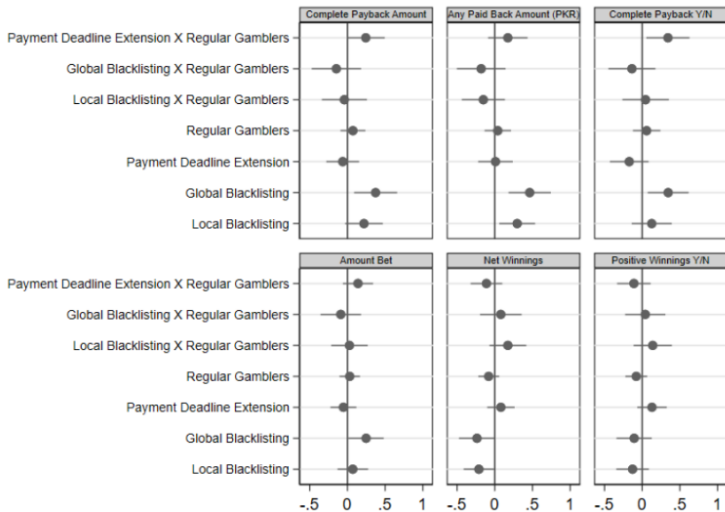
Alternate Mechanism: Composition Effects



Regular vs Irregular Gamblers

- Do regular gamblers payback more when payment deadline extended?
- Do they payback more when blacklisted?

Heterogeneity by Gambling Regularity



Point Estimates with 95% CIs (Heterogeneity by Regular vs Irregular Gamblers)

Future Work

- How does the illegal gambling market shape social norms?
 - How and why do people reconcile seemingly contradictory norms (religious versus gambling norms)?
 - How does participation in this illegal “immoral” environment spillover to other norms?
 - Does breaking one norm, gives you license to break other norms? (pilot was in Ramadan)

Impact on Partial Amount Paid Back

| | (1) | (2) | (3) | (4) |
|-----------------------------------|---|----------------------|--|----------------------|
| | <i>Partial Paid Back Amount (PKR)</i> | | <i>Partial Paid Back Amount Standardized</i> | |
| <i>Global Blacklisting</i> | 12,792*** [2,784] | 12,741*** [2,782] | 0.326*** [0.0710] | 0.325*** [0.0709] |
| <i>Local Blacklisting</i> | 7,395*** [2,662] | 7,313*** [2,664] | 0.189*** [0.0679] | 0.186*** [0.0679] |
| <i>Payment Deadline Extension</i> | 6,019*** [2,237] | 5,918*** [2,235] | 0.153*** [0.0570] | 0.151*** [0.0570] |
| Controls | No | Yes | No | Yes |
| Observations | 2,505 | 2,505 | 2,505 | 2,505 |
| R-squared | 0.030 | 0.035 | 0.030 | 0.035 |
| Mean of dependent var | 43268.19 | 43268.19 | 0.00 | 0.00 |

Balance - Joint Orthogonality Test

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------------------|------------------------|------------------------|----------------------------------|------------------------|------------------------|------------------------|----------------------------------|------------------------|
| | Global Blacklisting | Local Blacklisting | Payment Deadline Extension | Decision Aid | Global Blacklisting | Local Blacklisting | Payment Deadline Extension | Decision Aid |
| | Full Sample | | | | Payback Sample | | | |
| <i>Gender</i> | -0.0303 [0.0329] | 0.0155 [0.0288] | 0.000940 [0.0406] | 0.0404 [0.0385] | -0.00917 [0.0404] | 0.00103 [0.0379] | 0.00872 [0.0483] | 0.0533 [0.0470] |
| <i>Age</i> | -0.000883 [0.00113] | 0.00122 [0.00116] | -0.00203 [0.00147] | 0.00383** [0.00153] | -9.65e-05 [0.00143] | 0.000895 [0.00146] | -0.00212 [0.00175] | 0.00370** [0.00188] |
| <i>Muslim</i> | 0.0302 [0.0222] | -0.0162 [0.0265] | -0.0622* [0.0355] | 0.0785*** [0.0304] | 0.0328 [0.0291] | -0.0124 [0.0339] | -0.0807* [0.0455] | 0.0379 [0.0417] |
| <i>Family Members</i> | 0.00155 [0.00161] | -0.000915 [0.00157] | 0.00276 [0.00211] | -0.000688 [0.00217] | 0.00121 [0.00199] | -0.00129 [0.00188] | 0.00227 [0.00254] | -0.000320 [0.00268] |
| <i>Ethnicity Punjabi</i> | -0.00173 [0.0131] | -0.00460 [0.0136] | -0.0190 [0.0180] | 0.0377** [0.0175] | 0.0140 [0.0155] | 0.00460 [0.0160] | -0.0266 [0.0214] | 0.0338 [0.0217] |
| <i>Years of Education</i> | 0.00364* [0.00190] | -0.00141 [0.00173] | -0.00319 [0.00253] | -0.000587 [0.00237] | 0.00341 [0.00230] | -0.000867 [0.00209] | -0.00260 [0.00293] | 0.00122 [0.00294] |
| <i>Employed</i> | 0.00168 [0.0108] | 0.00861 [0.0110] | -0.0101 [0.0148] | 0.00849 [0.0150] | 0.00736 [0.0132] | 0.00186 [0.0135] | -0.0204 [0.0178] | 0.0110 [0.0185] |
| <i>Own Property</i> | 0.00245 [0.0107] | -0.00207 [0.0108] | -0.0197 [0.0144] | 0.0130 [0.0146] | -0.000769 [0.0131] | -0.00930 [0.0131] | -0.0178 [0.0171] | 0.00859 [0.0179] |
| <i>Pre-treatment Payback</i> | -0.00633 [0.0118] | -0.0174 [0.0122] | 0.0120 [0.0158] | -0.00586 [0.0160] | -0.00255 [0.0146] | -0.0286* [0.0149] | 0.0140 [0.0188] | 0.00843 [0.0196] |
| <i>Pre-treatment Amount bet</i> | [1.42e-07] | [1.48e-07] | [1.86e-07] | [1.95e-07] | [4.54e-08] | [4.60e-08] | [5.43e-08] | [6.02e-08] |
| <i>Pre-Treatment Confidence</i> | 0.00706 [0.00516] | 0.0115** [0.00518] | 0.00510 [0.00721] | -0.0141* [0.00751] | 0.0139** [0.00615] | 0.0154** [0.00626] | 0.000649 [0.00882] | -0.0165* [0.00940] |
| <i>Pre-Treatment Risk</i> | -0.00371 [0.00539] | -0.00455 [0.00542] | -0.00797 [0.00731] | 0.00301 [0.00740] | -0.00667 [0.00675] | -0.00693 [0.00653] | -0.0122 [0.00868] | 0.0193** [0.00909] |
| <i>Pre-Treatment Coordination</i> | 0.00345 [0.00549] | 0.00154 [0.00553] | -0.00622 [0.00713] | 0.00808 [0.00731] | 0.00896 [0.00678] | -0.00292 [0.00658] | 0.000231 [0.00847] | 0.00480 [0.00902] |
| <i>Pre-Treatment Cooperation</i> | -0.000136 [0.00496] | 0.00889 [0.00542] | -0.0120* [0.00684] | 0.00570 [0.00716] | -0.00513 [0.00611] | 0.00507 [0.00676] | -0.00641 [0.00818] | 0.0112 [0.00854] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 3,639 | 3,639 | 3,639 | 3,639 | 2,505 | 2,505 | 2,505 | 2,505 |
| R-squared | 0.020 | 0.020 | 0.018 | 0.022 | 0.029 | 0.030 | 0.024 | 0.029 |
| F Statistics (Joint Significance) | 0.83 | 1.26 | 1.23 | 1.90 | 1.11 | 1.17 | 0.92 | 1.38 |
| p-values (Joint Significance) | 0.642 | 0.222 | 0.245 | 0.022 | 0.343 | 0.290 | 0.551 | 0.154 |
| Mean of dependent var | 0.116 | 0.120 | 0.245 | 0.256 | 0.119 | 0.120 | 0.234 | 0.269 |