Angry Borrowers: Negative Reciprocity in a Financial Market

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Research Question and Answer

This papers asks whether a particular type of social shaming – targeting a delinquent borrower's social circle – is an effective debt-collection technique.

NO.

Why not?

IT BACKFIRES.

Borrowers become angry and they refuse to pay.

Questions for Referee

(1) Is the research question important?

Must be.

It links two big topics

a) Debt

(28,629 downloads in SSRN)

b) China – the world's most populous country

(29,495 downloads in SSRN)

"Neither a borrower nor a lender be…"

(Act I, Scene III. Hamlet, Shakespeare)

Questions for Referee (contd.)

(2) Are the results novel?

Yes.

Why?

Because whenever there is debt delinquency, history, literature, popular culture and current affairs have given us tales of angry lenders.

I have never heard stories of angry borrowers.

ANGRY LENDERS

The word “bankruptcy” is said to stem from an Italian tradition of destroying the workbench of a tradesman who couldn't pay his debts. The Italian phrase for broken bench, *banca rotta*, is the origin of the word.

ANGRY LENDERS

West – The Debt Collector
https://www.youtube.com/watch?v=Ko4W9Ms6vWU

East – The Squid Game
https://www.youtube.com/watch?v=JsJUGCY81q8
3:15-4:30

World: Bonded Labor
https://library.oapen.org/bitstream/id/82f3ba07-8664-48af-8cf8-10c3b24b54c9/1004351.pdf

ANGRY LENDERS IN MODERN CHINA

Lock victims up and intimidate them until the loan is paid

http://www.xinhuanet.com/2019-04/19/c_1124390512.htm

Yin-yang contracts to hide illegal loan agreements

http://www.gov.cn/fuwu/2019-09/09/content_5428451.htm

Use auto redial to intimidate victims and friends and families until loan is repaid

http://www.gov.cn/fuwu/2019-09/09/content_5428451.htm

Target mainly students and female. These loans require borrowers to send nude pictures as collateral, which will be used for subsequent debt collection process.

https://www.sohu.com/a/300630302_427249

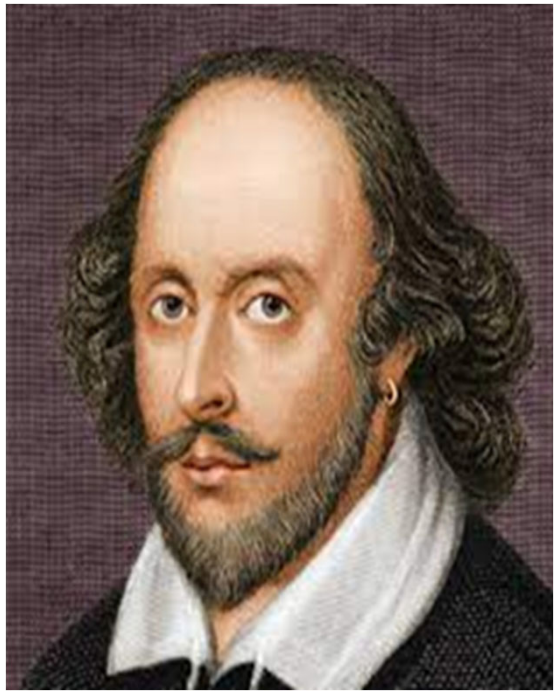
ANGRY LENDERS IN MODERN CHINA

Police display other weapons seized from debt collectors. Photo: CFP

Source:
How China's debt collectors go to work - Global Times

NUANCED VIEWS OF LENDERS VS BORROWERS

Merchant of Venice, Shakespeare



PORTIA
A pound of this merchant's flesh is yours. The court awards it and the law authorizes it.

SHYLOCK
What a righteous judge!

PORTIA
And you have to cut this flesh from his chest. The law allows it, and the court awards it.

SHYLOCK
What a wise judge! Come on, get ready.

PORTIA
But wait a moment. There's something else. This contract doesn't give you any blood at all. The words expressly specify "a pound of flesh." So take your penalty of a pound of flesh, but if you shed one drop of Christian blood when you cut it, the state of Venice will confiscate your land and property under Venetian law.

MODERN FINANCE

Debt contracts with explicit rules for lenders and borrowers. Possibility of debt renegotiation. Ex-ante suboptimal, but ex-post optimal OR Ex-ante optimal, but ex-post suboptimal. Debt overhang. Debt…

BUT ANGRY BORROWERS?

ONLY IN CHINA!!!

Debt with Chinese Characteristics

Questions for Referee (contd.)

(3) Is the execution competent?

Empirics – issues in interpreting results

Theory – issues even if the empirical results are correctly interpreted

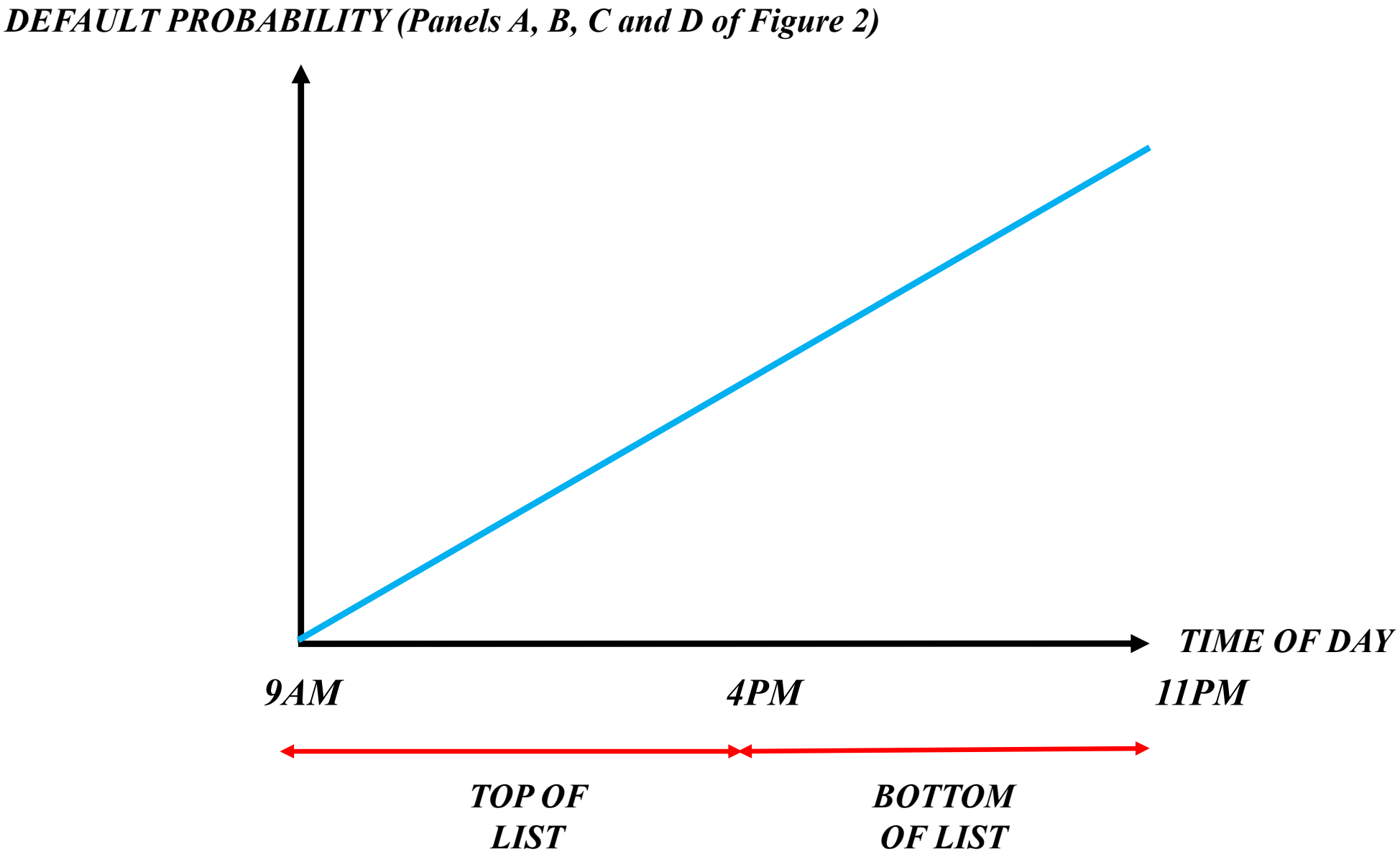
Empirical Research Design 1

Fact 1: Panel D of Table 1 shows that, in the entire sample, default rates of "worked" – friends are informed – loans are lower than the default rates of "unworked" loans – friends are not informed.

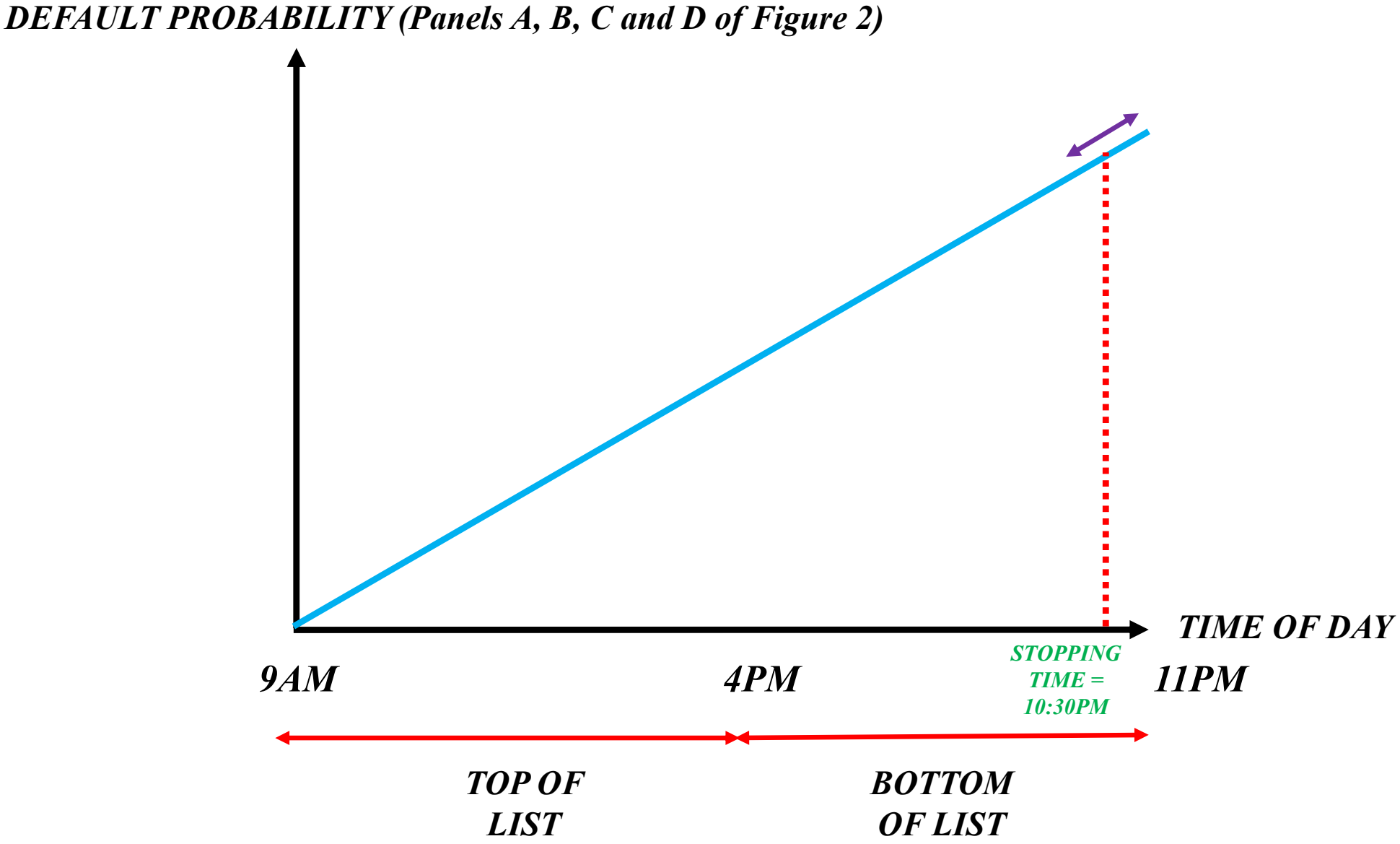
Fact 2: Table 2 shows that default increases as the time of day increases.

Fact 1 and Fact 2 imply that:

The Typical Workday of a Collection Agent Planned by a Proprietary Algorithm

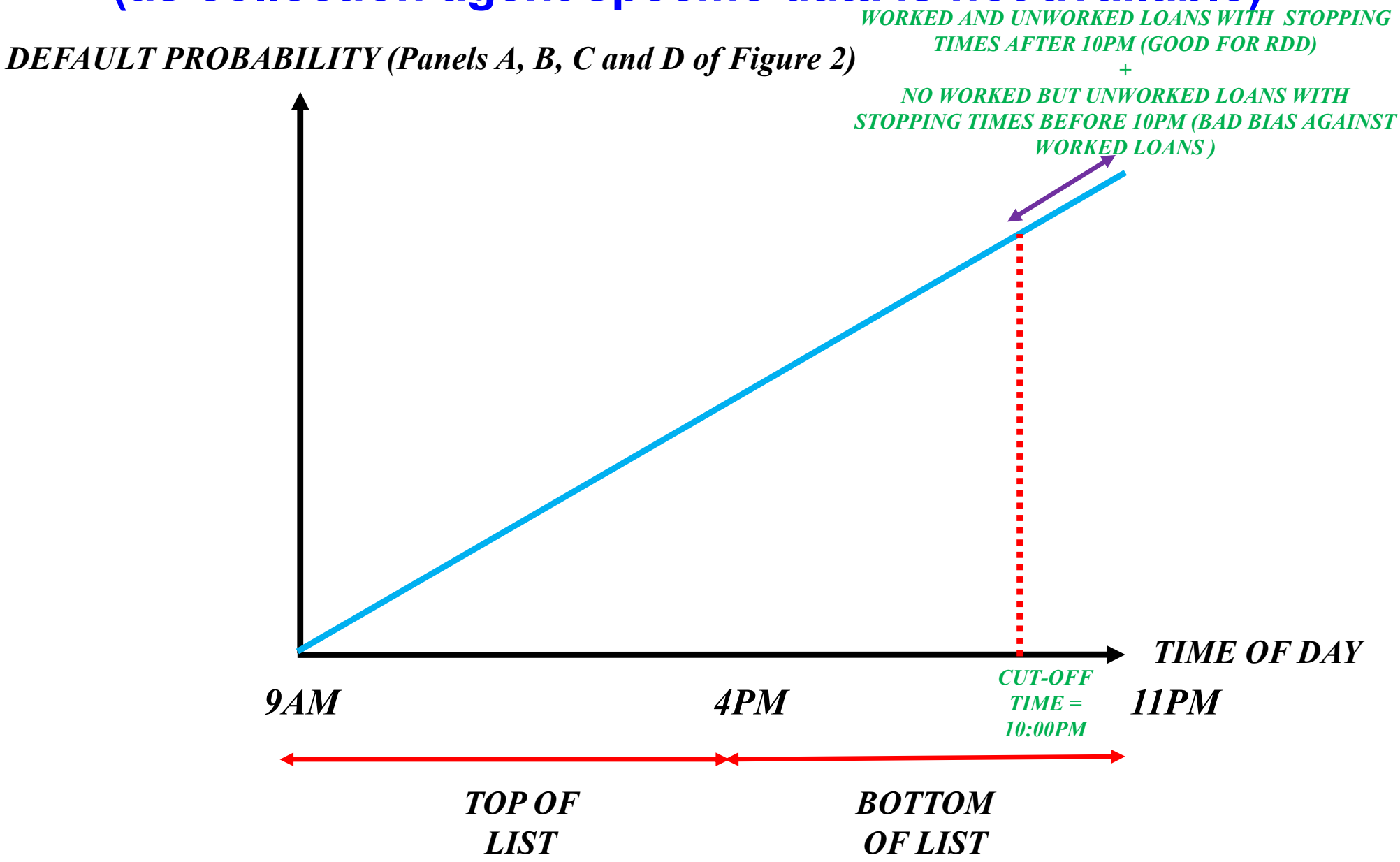


Proposed Identification Strategy: RDD Around A Stopping Time



Actual Identification Strategy: Loans After a Cutoff-Time

(as collection agent specific data is not available)



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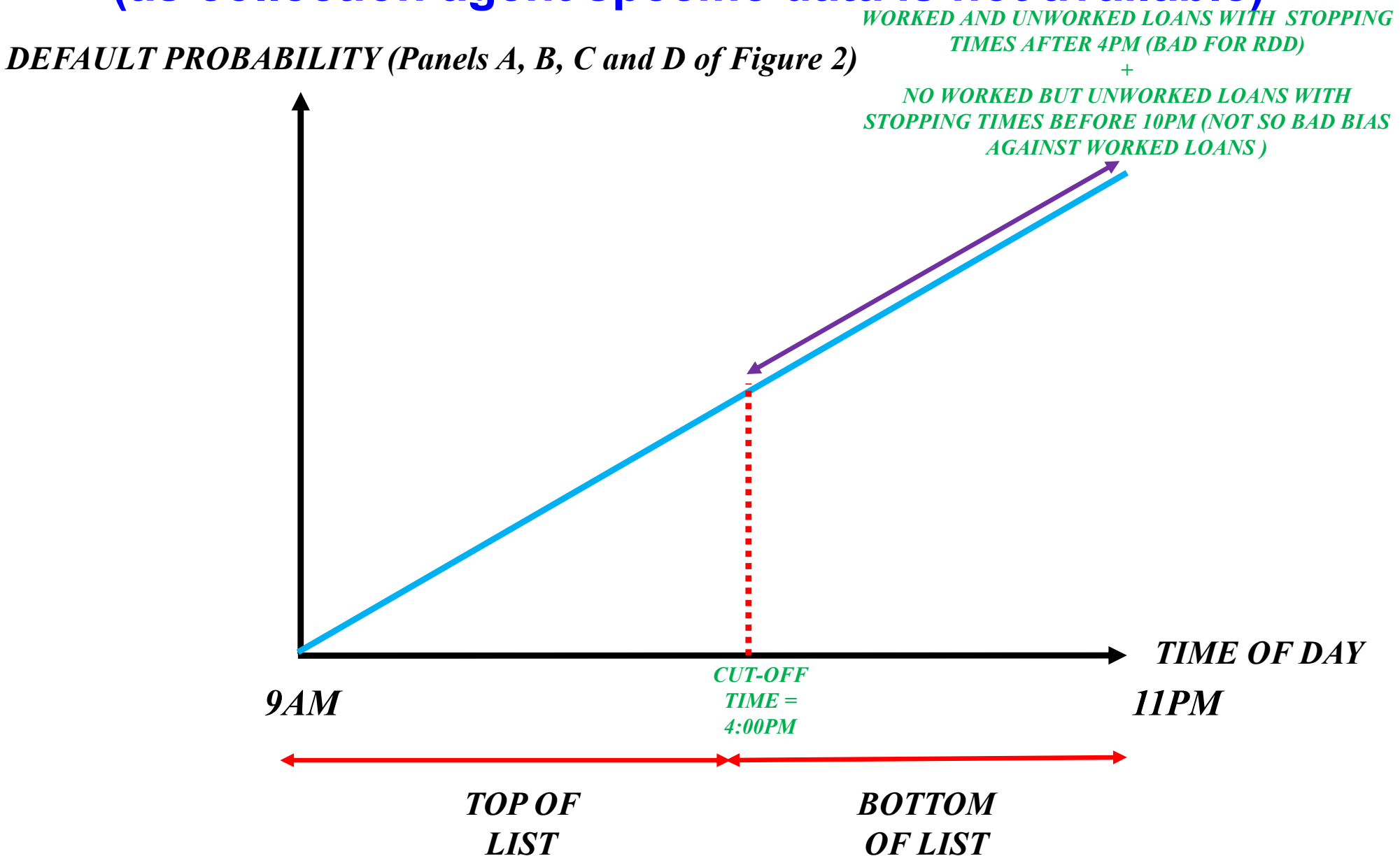

MAIN RESULT AND ITS INTERPRETATION

Cutoff time	Coefficient estimate for *Collect*
(1)	(2)
16:00	0.218**
	(0.096)
17:00	0.225**
	(0.098)
18:00	0.221**
	(0.101)
19:00	0.410***
	(0.117)
20:00	0.528***
	(0.148)
21:00	0.654***
	(0.200)
22:00	0.770***
	(0.243)

POSITIVE IF
Default (Worked) > Default (Unworked)

WORKED AND UNWORKED LOANS WITH STOPPING TIMES AFTER 4PM (BAD FOR RDD)
+
NO WORKED BUT UNWORKED LOANS WITH STOPPING TIMES BEFORE 4PM (NOT SO BAD BIAS AGAINST WORKED LOANS)

WORKED AND UNWORKED LOANS WITH STOPPING TIMES AFTER 10PM (GOOD FOR RDD)
+
NO WORKED BUT UNWORKED LOANS WITH STOPPING TIMES BEFORE 10PM (BAD BIAS AGAINST WORKED LOANS)

Tactic backfires; borrowers default more if their friends are called

DISCUSSION

(1) The issue with RDD is that it is only "locally" correct.

(2) Usually not a problem, because generalization to a larger sample is not too controversial.

(3) Unfortunately, for the authors, in the context of this research design – using cut-off time as a proxy for RDD – this generalization is not possible.

(4) As we saw, later cut-off time is good for RDD but bad for bias, whereas earlier cut-off time is bad for RDD but not so bad for bias. Both are bad choices.

(5) So what do we do?

(6) Junk this research design. It does not work.

(7) But suppose this research design works.

(8) Then we have other problems.

WHAT OTHER PROBLEMS?

Cutoff time	Coefficient estimate for *Collect*
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POSITIVE IF
Default (Worked) > Default (Unworked)

(1) All coefficients are positive
(2) Coefficients decrease as cut-off time is earlier in the day
(3) From fact 1, we know that default rates of "worked" loans are lower than the default rates of "unworked loans. So the coefficient for cut-off time 9AM is negative.
(4) This implies that there exists a cut-off time (say 3PM) where the coefficient turns from positive to negative.
(5) This implies that borrowers are angry only after 3PM.

DISCUSSION EVEN IF RESEARCH DESIGN IS CORRECT

(1) So the only claim that can be made is that borrowers become angry only after 3PM if their friends are called.

(2) Why? I have no idea.

(3) But that is another paper, not this one.

(4) This new paper will have to resolve some contradictions

(e.g the old paper says that people with outside options are more angry,
but debtors after 3PM have less outside options (since less creditworthy debtors are called later in the day) and yet they are more angry.)

(5) Junk this research design. Go to PSM.

Empirical Research Design 2

Employ the old workhorse:

PSM (Propensity Score Matching)

Match each unworked loan with worked ones which have the same propensity to be worked on.

MAIN RESULT AND ITS INTERPRETATION

Panel B. Regression analysis using the matched sample

Dependent variable:	*Default*
Work	0.557***
	(0.134)
Size (RMB)	0.592***
	(0.115)
Term (Month)	0.110***
	(0.027)
#Payments	-0.196***
	(0.046)
Interest rate	0.278
	(0.218)
Male	0.292**
	(0.146)
Age	0.008
	(0.010)
BigCity	-0.023
	(0.136)
#Contacts	0.056*
	(0.032)
Taobao	-0.788***
	(0.177)
NewBorrower	-0.044
	(0.179)
RatingB	0.150
	(0.244)
RatingC	0.707***
	(0.201)
RatingD	0.764***
	(0.211)
RatingE	1.285***
	(0.281)
RatingF	1.024***
	(0.257)
Constant	-6.276***
	(0.955)
Month fixed effects	Yes
Observations	646
Pseudo R-squared	0.302

Tactic backfires; borrowers default more if their friends are called

DISCUSSION

(1) Unfortunately, for the authors, in the context of this research, the use of PSM has a peculiar paradox.

(2) Recall that the lender has developed a proprietary algorithm to forecast repayment propensity, and borrowers are ranked accordingly. A list is developed, where the best are to be called earlier. This implies that a worked loan and an unworked loan around stopping time has almost the same propensity to be worked.

(3) Given that the proprietary algorithm is likely to be more accurate than the authors' own algorithm – the former uses private information as well programmers who are paid to develop efficient algorithms – the proprietary algorithm should be used for the PSM.

DISCUSSION (CONTINUED)

(4) This is not possible. So the authors use their own code.

(5) They match each unworked loan with four worked loans.

(6) Note that the worked loans have time stamps, but the unworked loan does not.

(7) It is possible that we are comparing the first unworked loan of an agent who stopped working at 3PM – borrower with low propensity to default – with 4 worked loans after 9PM – borrower with high propensity to default. BIG BIAS.

(8) We cannot tell.

THEORY

(1) The authors pitch their paper as an example of "negative reciprocity," but is it really?

(2) Negative reciprocity occurs when person B negatively affects person A after person A has negatively affected person B. What makes it interesting is that sometimes, though not always, it is not in person B's best interest to retaliate.

(3) Most of these situations occur in one-shot games. What makes it interesting is that they sometimes occur in multi-period games as well.

(4) Most of these situations occur between people who are not linked by formal contracts. However, there are instances of reciprocity – both positive and negative – occur between people linked by formal contracts.

THEORY (Contd.)

(5) What is different here?

(6) Debt is different.

(7) The debt contract is a formal contract where negative reciprocity is explicit in the contract: if borrower is delinquent, lender does something bad to the borrower.

(8) Sometimes the borrower is delinquent, the lender does something bad, and the borrower does default.

(9) Is this "Negative Reciprocity"?

(10) Or is it rational? Borrower had no other option? Strategic default?

THEORY (Contd.)

(11) Or is the borrower behavior unexpected and off-equilibrium? If so, do we settle down later to a stable equilibrium?

(12) I am partial to the above alternate hypothesis because

a)The effect appears in October 2015-August 2016, but not in September 2016-March 2017

b)The stable equilibrium continues to exist in July 2017-November 2019 (Dai, Han, Shi, Zhang, 2021)

(13) If my alternate hypothesis is correct, the questions are far more interesting:

a)How far will social shaming proceed before the equilibrium becomes unstable?

b)How far will social shaming be allowed to proceed?

c) How much should “limited” be in “limited liability”?

Questions for Referee (contd.)

(4) Is there clarity in presentation?

MAJOR

a) The explanation of negative reciprocity and its link to debt default should be improved.

b) It is true that men have higher testosterone but women value privacy more. Not clear who should get angrier.

c) True that borrowers with outside options should get more angry, but the ones who get angry are the ones with fewer outside options (the 3PM cutoff)

d) Reduced ability to borrow from social contacts will affect consumption only if consumption is funded by such borrowings.

MINOR

"Small dollar loans" or "small renminbi loans"?

WITH GREAT POWER COMES GREAT RESPONSIBILITY

WITH BIG CLAIMS COME BIG BURDENS OF PROOF

REJECT

RETHINK

REPOSITION

RESUBMIT