Lighthouse in the Dark: Information in Private Lending

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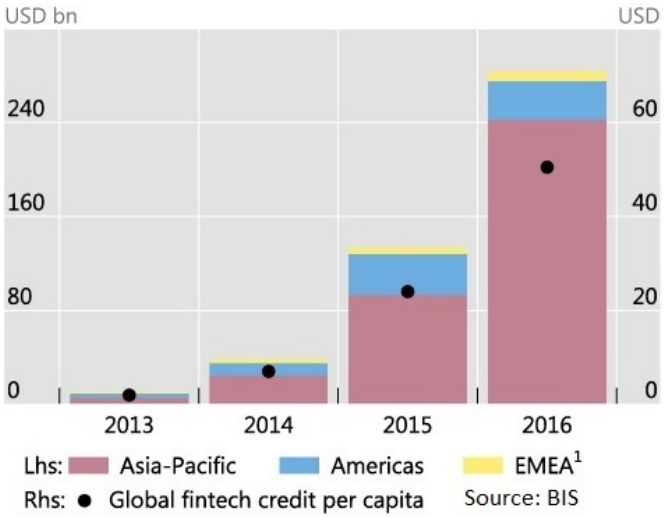
Background

- Fintech credit (e.g. P2P) has grown rapidly around the world
  - Broaden access to finance for naive individuals and small businesses
  - China is the largest market for FinTech credit



- In 2011, private lending crisis in China. From 2012, Private Lending Registration Service Centres (Pcentres) were gradually introduced by local governments in many Chinese cities

This paper examines the impact of the introduction of Pcentres on P2P lending contracts and outcomes based on data from Renrendai (China)

Introduction

Research Question:

- With the introduction of reference information, will individual borrowers in the online P2P credit market change their setting of contracts and repayment performance?

Reference Information: freely accessible local market information and financial knowledge provided by the government (public goods)
Challenge: the introduction of Pcentres is endogenous
Methodology:

- DID, with private lending problem in Chinese political cycle as IV
- Quantile regression (Chetverikov et. al 2016)

Private Lending Registration Service Centre (Pcentre), offline

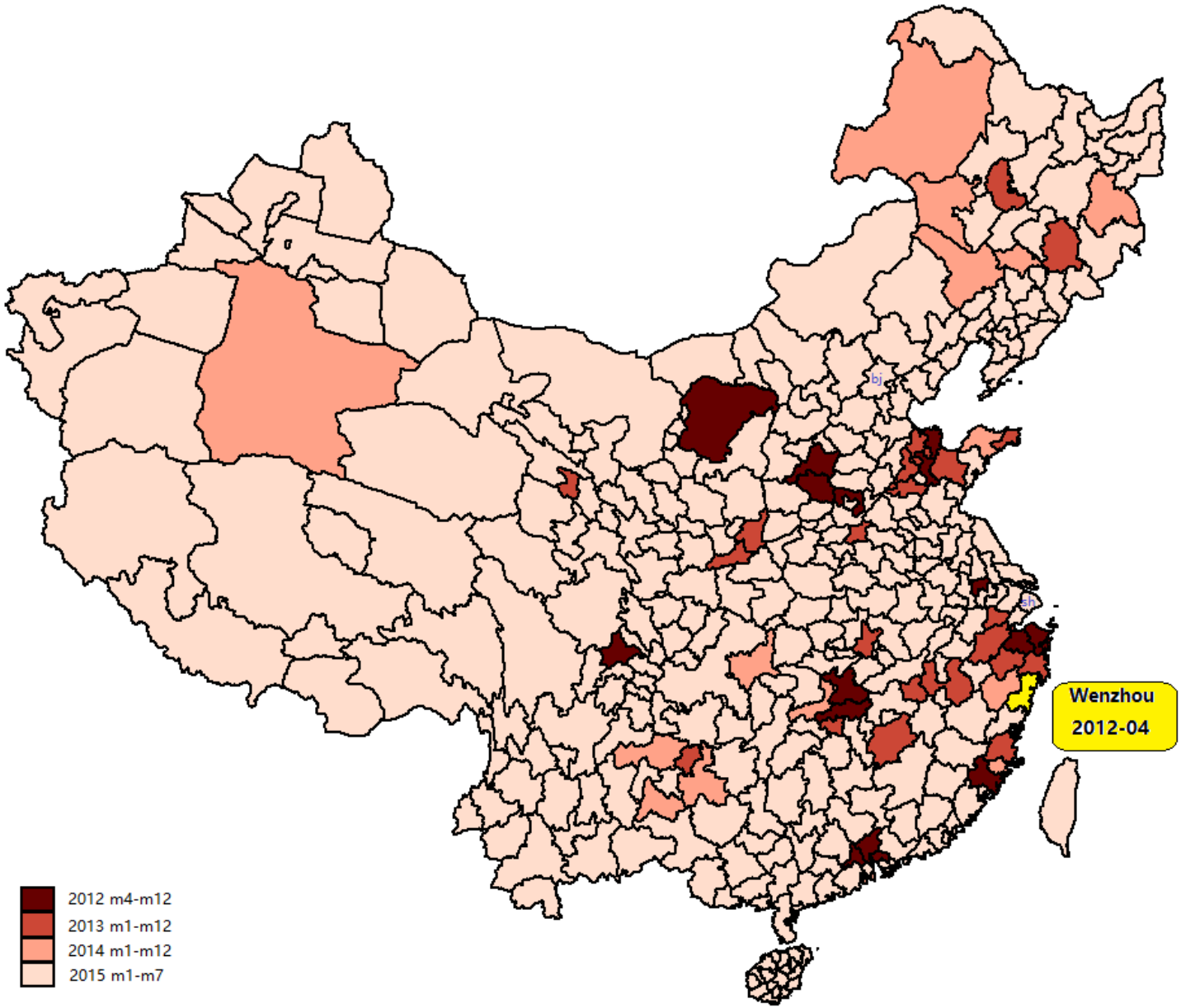
What Pcentres do?

- Gather all necessary financial agencies for private lending in one physical location
  - Financial intermediaries, legal advice, notary office, etc
- Provide local market information and disseminate financial knowledge

Example: Private Lending Index, 2014-09-15 to 2014-09-19, Wenzhou

1-month	3-month	6-month	1-year	more than 1 year
19.87%	20.34%	17.48%	16.26%	18.01%

Staggered Introduction of Pcentres in China



Main Findings

- The introduction of Pcentres increases the success rate and liquidity of P2P loan applications. There are more applications.
- There's **less dispersion** in the contract terms (i.e., interest rate, maturity and amount) for P2P loans to borrowers whose working city had Pcentres. This effect is mainly driven by the lower educated.
- The introduction of Pcentres improves the repayment performance.

Interpretation

Individuals in treated cities, particularly the lower educated, write more standardized contracts and have better outcomes.

Contribution

A novel evidence that the government can provide information as public goods to guide the informal financial market.

Data

- Sample period: 2010 October to 2015 June
- 311 Chinese cities, among which 55 treated
- P2P data: 639,948 P2P loan request listings on Renrendai
  - One of China's largest P2P platforms
  - Aggregate at (city, year-month) level
  - Average loan: €8300, 18-month, annual interest rate 13.3%
  - Mainly individual borrowers and investors

Table: Education background of borrowers

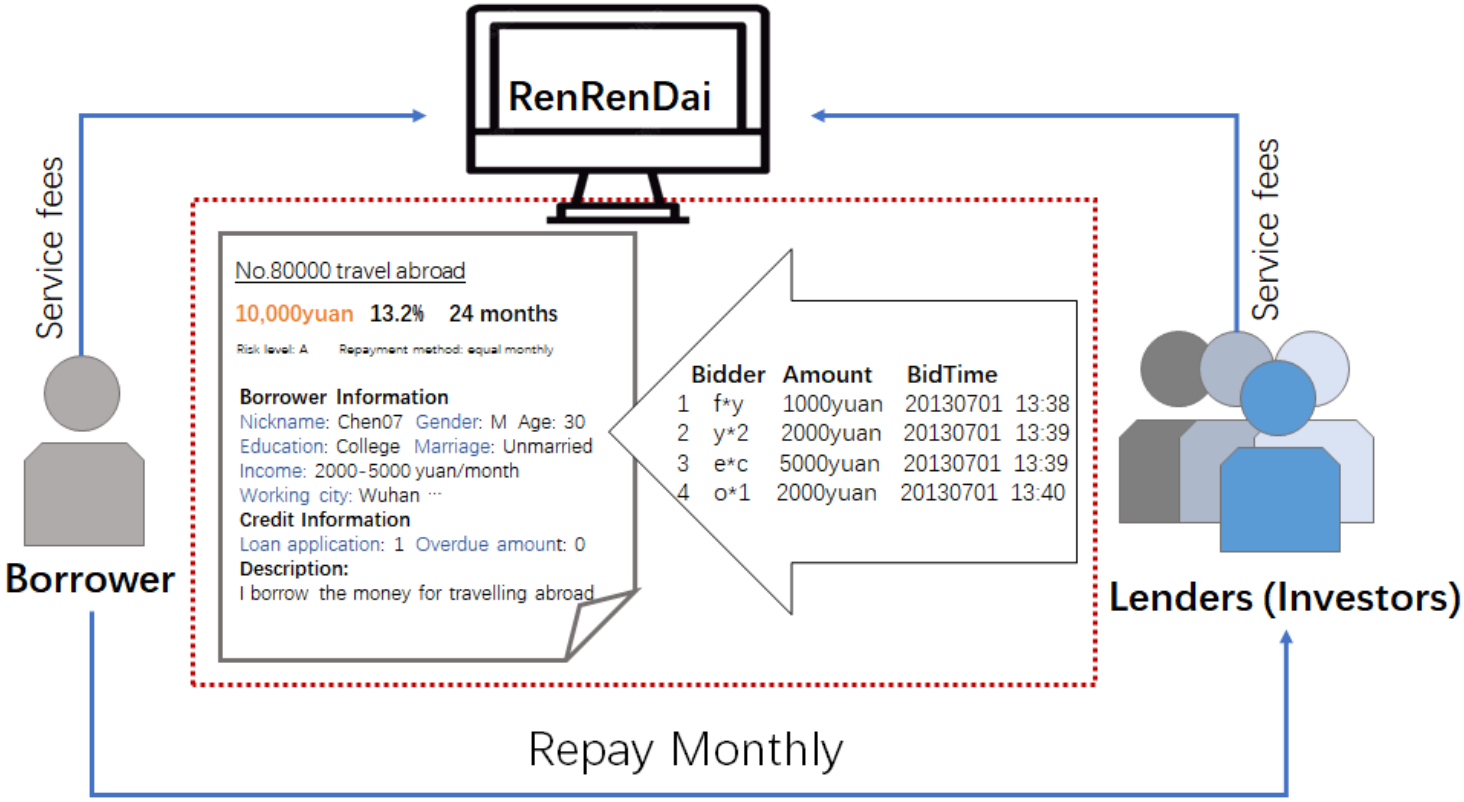
Degree	Fraction
master+	1.5%
bachelor	19.4%
junior college	37.3%
high school -	41.8%

- City level data (GDP): China Stock Market & Accounting Research

Renrendai, online

Posted (fixed) Prices

- Borrowers post loan request listings with the amount, interest rate, maturity and personal information.
- Investors bid on listings by specifying the amount of bid.
- Only 100% invested applications successfully get money.



Empirical Analysis

Staggered DID with IV

$$Y_{ct} = \beta Treated_{ct} + \alpha_t + \zeta_c + \epsilon_{ct}$$

where

- Y is city c's monthly average success ratio, loan characteristics (i.g. amount, interest rate, maturity), repayment performance
- $Treated_{ct} = 1$ if borrower's working city c has Pcenters at t
- α_t and ζ_c are time and city fixed effects

- **Identification (Levitt, 1997)**: use IV, private lending problem in local political cycle, $PLP_{ct} \times D(Newmayor)_{ct}$
  - $PLP_{ct} = \left(\frac{\sum_{t-13}^{t-2} News_{c\tau}}{10}\right)^3$. News are collected from Baidu with keywords "City name+Private lending"
  - $D(Newmayor)_{ct} = 1$ if city c got a new mayor in $[t-13, t-2]$

Result 1: More effective P2P applications

Success rate ↑, more effective

Table: The Effect of PCentres on Trading

	FULL		FULL		SUCCESS		SUCCESS	
	(1) SuccR	(2) SuccR	(3) FiniR	(4) FiniR	(5) Tot.A	(6) Tot.A	(7) N(L)	(8) N(L)
Treated	0.18***	0.03***	0.27***	0.11***	738.2***	781.7***	68.7***	74.9***
	(9.64)	(3.65)	(13.11)	(10.19)	(6.86)	(7.52)	(5.92)	(6.61)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14597	14593	14597	14593	4914	4914	4914	4914
BorrowerControls	No	Yes	No	Yes	No	Yes	No	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age. $Tot.A$ is total loan amount. $N(L)$ is the number of success loans. $N(A)$ is the number of borrowers successfully get loans.

Result 1: More effective P2P applications

Loans from treated cities are more liquid

Measure of illiquidity for a P2P loan listing: $illiq_i$=difference of first bidding time and last bidding time (milliseconds).

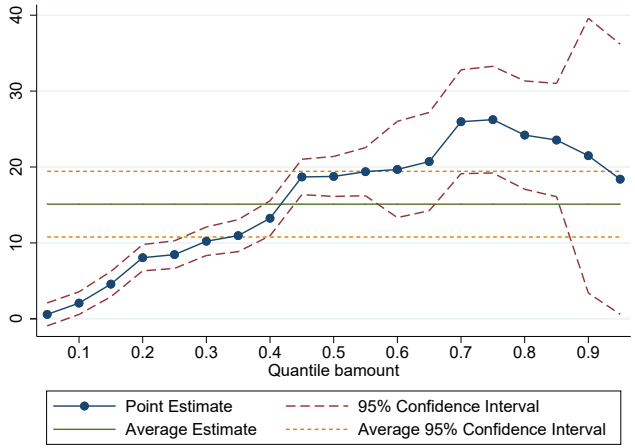
Table: The Effect of PCentres on Illiquidity

	IV(2SLS)	
	(1) Illiquidity	(2) Illiquidity
Treated	-22746564.7***	-22618312.8***
	(-6.70)	(-6.12)
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Observations	8536	8536
BorrowerControls	No	Yes

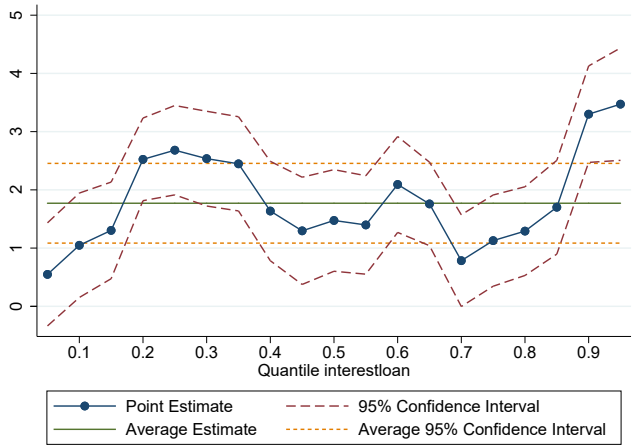
where Iliquidity is the aggregated $illiq_i$ at (city year-month) level. *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age.

6.3 hours less.

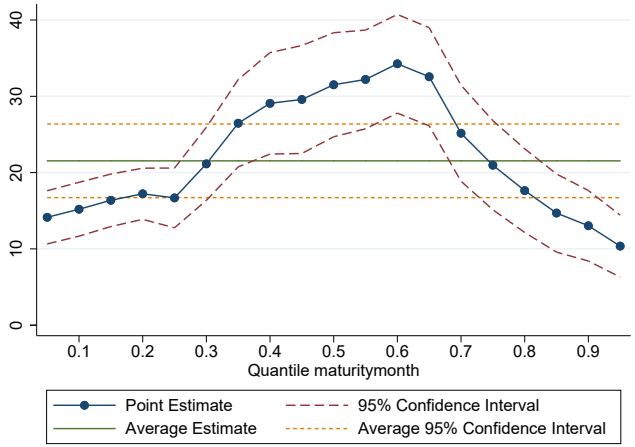
Result 2: Distributional Effects of Pcentres



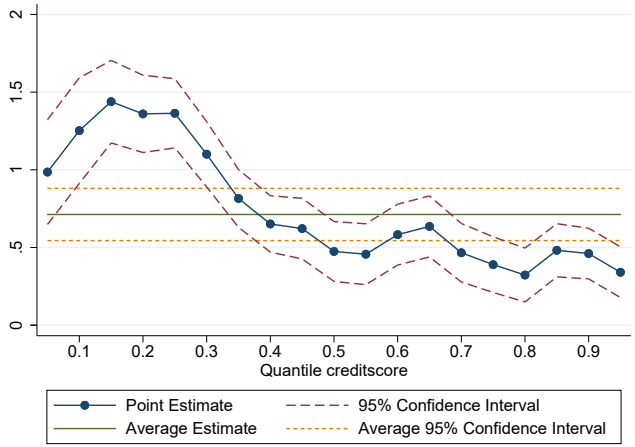
(a) Loan amount



(b) Loan interest rate



(c) Loan maturity



(d) Borrower creditscore

Result 3: Less Dispersion in Contract Terms

Coefficient of Variation (CV)

- A measure of the dispersion of contract terms
- It captures the degree of variation around the mean

$$CV = \frac{\sigma}{\mu}$$

Result 3: Less Dispersion in Contract Terms

Borrowers set more standardized contracts.

Table: The Effect of PCentres on Dispersion in Contract Terms

Panel A	IV(2SLS), Success		IV(2SLS), Success		IV(2SLS), Success	
	(1) cv.Amount	(2) cv.Amount	(3) cv.Maturity	(4) cv.Maturity	(5) cv.R	(6) cv.R
Treated	-0.711*** (-7.77)	-0.776*** (-7.73)	-0.295*** (-6.27)	-0.216*** (-5.01)	-0.0204 (-1.45)	-0.00429 (-0.30)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3295	3295	3295	3295	3295	3295
BorrowerControls	No	Yes	No	Yes	No	Yes

Panel B	cv.R		cv.Amount		cv.Maturity	
	(1) >=B	(2) <B	(3) >=B	(4) <B	(5) >=B	(6) <B
Treated	0.0227 (0.34)	-0.0607*** (-3.56)	-0.223 (-1.01)	-0.736*** (-7.05)	-0.480* (-2.25)	-0.241*** (-4.86)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1104	2331	1104	2331	1104	2331
BorrowerControls	Yes	Yes	Yes	Yes	Yes	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age.
Panel B estimates the effects on borrowers with different education background, $>=$ *Bachelor* vs $<$ *Bachelor*.

Result 3: Less Dispersion in Contract Terms

1m, 3m, 6m, and 12m P2P loans

1m, 3m, 6m, 12m P2P loans are more exposed to the information posted by Pcentres.

Table: The Effect of PCentres on Dispersion in Contract Terms, more exposed types of loans

	R	ln
Treated × Exposed	-0.693 ***	8.32 ***
	(-2.93)	(-2.69)
Treated	0.463 ***	43.74***
	(-2.37)	(17.19)
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Observations	9539	9539
BorrowerControls	Yes	Yes
ContractTermControls	Yes	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age.

And also borrowers spent less time in filling the loan request form.

Result 4: Better Repayment Performance

The measure of repayment performance is constructed as follows,

$$EarlyRepay_{ct} = \frac{N(\text{Early repayment flows})_{ct}}{N(\text{Repayment flows})_{ct}}$$

Table: The Effect of PCentres on Repayment Performance

	RepayOnDate		EarlyRepay		LateRepay		NotRepay	
	(1) 2SLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS	(6) 2SLS	(7) 2SLS	(8) 2SLS
Treated	0.28***	0.21***	-0.15***	-0.14***	0.02	0.07*	-0.15***	-0.15***
	(4.79)	(3.59)	(-3.56)	(-3.67)	(0.59)	(2.12)	(-4.63)	(-3.87)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11275	11273	11275	11273	11275	11273	11275	11273
BorrowerControls	No	Yes	No	Yes	No	Yes	No	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age. Early repayment incurs fees.

Conclusion

- Pcentres boost the P2P lending market
- Less dispersion of contract terms
- Borrowers spent less time in filling the request form. Lower educated are more affected
- Better repayment performance. Borrowers become more financial sophisticated
- A novel evidence of government's provision of information as public goods to guide the informal financial market

Appendix

First Stage

Table: First Stage, 2SLS

	FULL SAMPLE		SUCCESS SAMPLE	
	(1) Treated	(2) Treated	(3) Treated	(4) Treated
PLP× D(Newmayor)	0.00328***	0.00326***	0.00291***	0.00295***
	(26.49)	(23.82)	(12.91)	(13.57)
City FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
Borrower Controls	No	Yes	No	Yes
Observations	14597	14593	4914	4914
F	701.5	281.6	166.7	39.57

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age .

Appendix

Table: Exclusion

	FULL SAMPLE	SUCCESS SAMPLE
	(1) $D(Newmayor)_{t-1}$	(2) $D(Newmayor)_{t-1}$
$GDPgrowth_{t-1}$	-0.151	0.345
	(-0.42)	(0.46)
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Observations	9758	2444

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Appendix

Table: Exclusion

	(1) cv.Amount	(2) cv.Maturity	(3) cv.R
D(Newmayor)	0.0313* (2.13)	0.00471 (0.72)	0.00190 (0.79)
Observations	10507	10507	10507
BorrowerControls	Yes	Yes	Yes

t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Appendix

Table: The Effect of PCentres on Dispersion of Contract Terms, Same Lender

	IV(2SLS)		IV(2SLS)		IV(2SLS)	
	(1) cv.R	(2) cv.R	(3) cv.Amount	(4) cv.Amount	(5) cv.Maturity	(6) cv.Maturity
Treated	-0.00344	-0.00345	-0.0939**	-0.0890**	-0.0428***	-0.0446***
	(-1.39)	(-1.42)	(-3.11)	(-2.91)	(-4.09)	(-4.89)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE×T	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196552	196481	196558	196486	196552	196481
BorrowerControls	No	Yes	No	Yes	No	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age.

Appendix

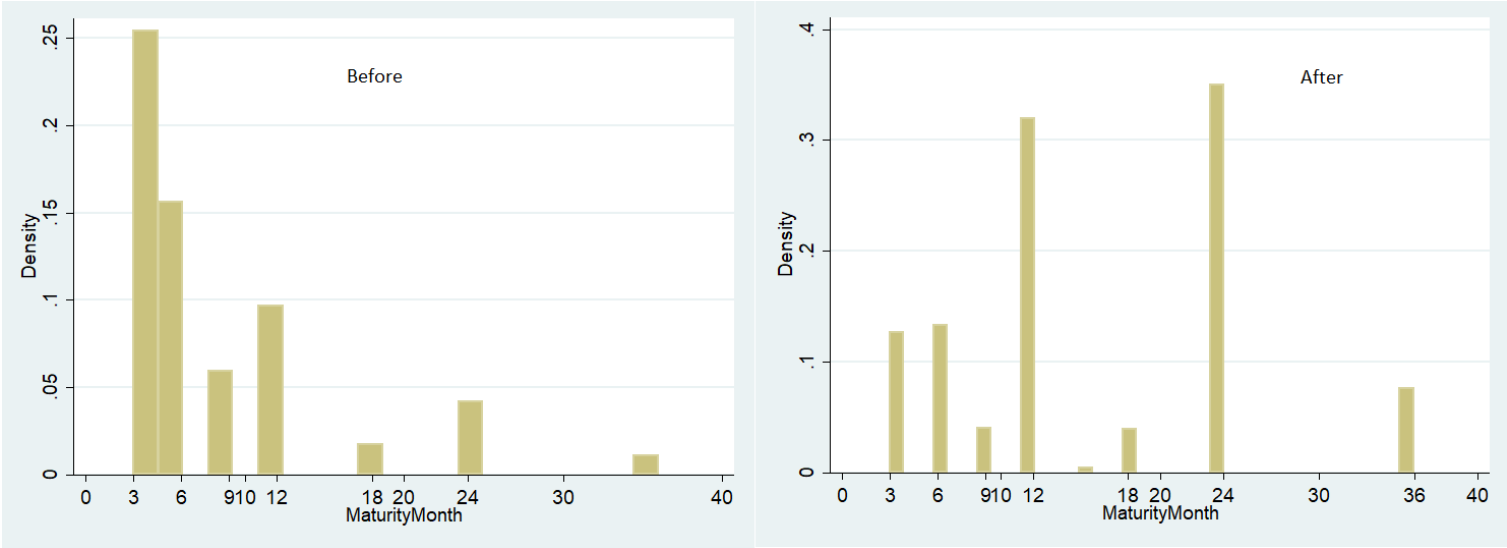
Table: The Effect of PCentres on Loan Characteristics, Same Lender

	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)
	(1) R	(2) Tot.A	(3) Avg.A	(4) Maturity
Treated	0.911***	-3.348	-7.069	4.136***
	(7.31)	(-0.60)	(-1.64)	(6.60)
City FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
Lender FE×T	Yes	Yes	Yes	Yes
Observations	1043378	1043390	1043390	1043378
BorrowerControls	Yes	Yes	Yes	Yes

where *BorrowerControls* is the average borrower characteristics including degree, marriage status, income, gender, working industry, credit score, and age.

Appendix

Figure: Wenzhou Pcentres, maturity of P2P loan requests



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