

Lighthouse in the Dark: Information in Private Lending

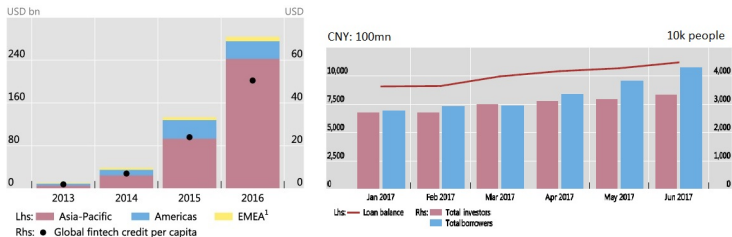
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Background

- 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 the wake of private lending crisis, Private Lending Registration Service Centres (Pcentres) have been gradually introduced in many Chinese cities since 2012

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

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?
- And why?

Challenge: the introduction of Pcentres is endogenous

Methodology

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

Private Lending Registration Service Centre (Pcentre)

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%



Main Findings

- The introduction of Pcentres increases the success rate of P2P loan applications. There are more applications. Aggregate loan volume goes up.
- 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.

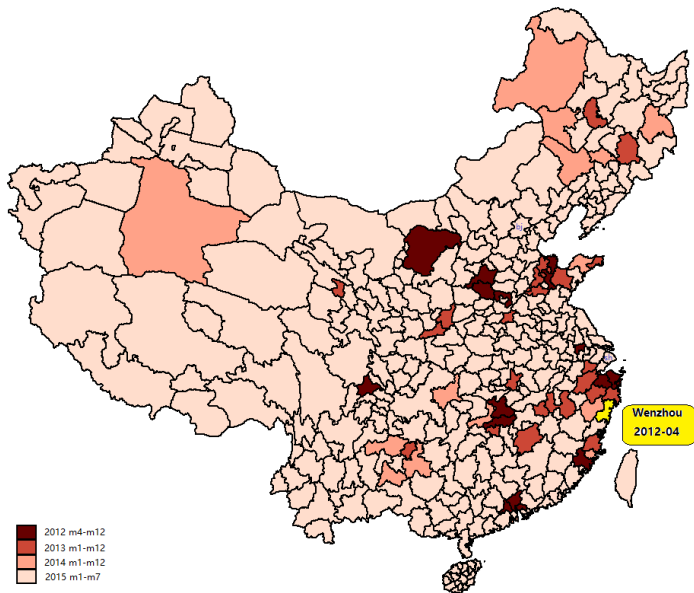
Interpretation

Individuals in treated cities, particularly the lower educated, write more standardized contracts and have better outcomes, suggesting that they are becoming more financially sophisticated.

Contribution

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

Staggered Introduction of Pcentres in China



- 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: £7000, 18-month, annual interest rate 13.3%
 - Mainly individual investors: >£1100, 20%; <£1100, 80%. 80% of investors bids less than 15 times per month

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

Data

Renrendai, Posted (fixed) Prices

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

NO.80000 travel abroad Online loans are risky, and lending needs to be cautious. 人人贷 renrendai.com Loan agreement (template)			
41,200 yuan Total	13.20 % annual interest rate	24 months repayment period	2015-07-08 Pay off time
Value date: 2013-07-08 Risk level: A Repayment source: --	Early repayment rate: 0.00% Repayment method: monthly repayment equal principal and interest	已还清	
Bulk	Bid	Repayment	Credit
Borrower information record performance information record			
Nickname: ChenW, 001550706ye	Name: Chen*	ID number: 34*****13	
Gender: male	Mobile number: 159****4562	Age: 31	
Education: College	Marriage: unmarried	Income: 2000-5000 yuan	
Property: without property	Mortgage: without mortgage	Car production: car-free production	
Car loan: without car loan	Company industry: other	The company has a size of: 500 or more	
Position post: captain	Working City: Hubei Wuhan	Working time: 3-5 years (inclusive)	
Other abilities: None			
Credit information			
Loan application: 1	Credit limit of: 0.00 yuan	Overdue amount of: 0.00 yuan	
Success borrowing: 1	Total borrowings: 41,200.00 yuan	0 times of overdue	
Pay off the amount in: 1	Pending principal and interest of: 0.00 yuan	Seriously overdue: 0	

Bulk Bid Repayment Credit Transfer			
Joined 37 people, the total amount of loans is 41,200.00 yuan			
Serial number	bidder	Bid amount	Bid time
1	1***y	50.00 yuan	July 06, 2013 03:38
2	y***2	100.00 yuan	July 06, 2013 03:38
3	1***i	500.00 yuan	July 06, 2013 03:38
4	Slaughter	400.00 yuan	July 06, 2013 03:38
5	0***y	3,950.00 yuan	July 06, 2013 03:38
6	adult	400.00 yuan	July 06, 2013 03:38
7	Electric fertilizer	800.00 yuan	July 06, 2013 03:38
8	Room ***	1,150.00 yuan	July 06, 2013 03:38
9	z***8	400.00 yuan	July 06, 2013 03:38
10	1***p	1,100.00 yuan	July 06, 2013 03:38
11	c***e	750.00 yuan	July 06, 2013 03:38
12	Vi Jinning	350.00 yuan	July 06, 2013 03:38
13	o***g	3,700.00 yuan	July 06, 2013 03:38

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

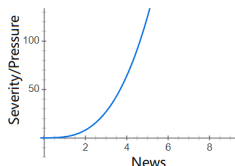
- Use IV: private lending problem in local political cycle
- Similar in spirit to the IVs of Levitt (1997) and Bian, Haselmann, Kick and Vig (2017)

Identification

IV: Private Lending Problem (PLP) in Chinese Political Cycle

Use $PLP_{ct} \times D(Newmayor)_{ct}$ to instrument the introduction of Pcentres

- PLP_{ct} equals to $\left(\frac{\sum_{t-13}^{t-2} News_{ct}}{10}\right)^3$
- $D(Newmayor)_{ct} = 1$ if city c got a new mayor in $[t-13, t-2]$



- **Data:** Private Lending News from Baidu.com

Use keywords "City name+Private lending" to collect the news. Then count the number of news for each month

First Stage

Table: First Stage, 2SLS

	FULL SAMPLE		SUCCESS SAMPLE	
	(1) Treated	(2) Treated	(3) Treated	(4) Treated
PLP \times D(Newmayor)	0.00328*** (26.49)	0.00326*** (23.82)	0.00291*** (12.91)	0.00295*** (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 .

Result 1: Pcentres increase P2P lending

Success rate and finished ratio increase

Table: The Effect of PCentres on Success Rate and Average Finished Ratio

	OLS		IV(2SLS)		OLS		IV(2SLS)	
	(1) SuccR	(2) SuccR	(3) SuccR	(4) SuccR	(5) FiniR	(6) FiniR	(7) FiniR	(8) FiniR
Treated	0.0407 (1.52)	-0.00101 (-0.21)	0.180*** (9.64)	0.0320*** (3.65)	0.0455 (1.67)	0.00157 (0.29)	0.265*** (13.11)	0.106*** (10.19)
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	14597	14593	14597	14593
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.

Result 1: Pcentres increase P2P lending

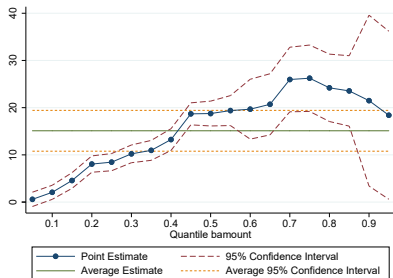
Trading volume increases

Table: The Effect of PCentres on Trading Volume

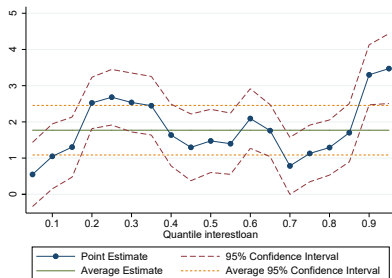
	IV(2SLS), Success		IV(2SLS), Success		IV(2SLS), Success	
	(1) Tot.A	(2) Tot.A	(3) N(L)	(4) N(L)	(5) N(A)	(6) N(A)
Treated	738.2*** (6.86)	781.7*** (7.52)	68.71*** (5.92)	74.93*** (6.61)	67.89*** (5.85)	74.05*** (6.54)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4914	4914	4914	4914	4914	4914
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. *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 2: Distributional Effects of Pcentres

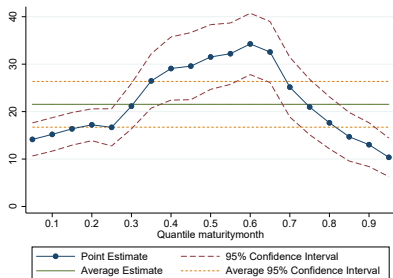


(a) Loan amount

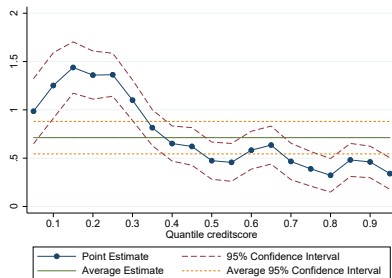


(b) Loan interest rate

Result 2: Distributional Effects of Pcentres



(c) Loan maturity



(d) Borrower creditscore

Result 2: Distributional Effects of Pcentres

Education Background, \geq Bachelor vs $<$ Bachelor

Table: The Effect of PCentres on Contract Terms, Education

	R		Amount		Maturity		TimeOnPage	
	(1) \geq B	(2) $<$ B	(3) \geq B	(4) $<$ B	(5) \geq B	(6) $<$ B	(7) \geq B	(8) $<$ B
Treated	-0.751 (-0.65)	1.387*** (4.65)	-16.46 (-0.90)	5.740** (3.22)	-26.98** (-2.85)	11.52*** (8.78)	-66.05 (-1.03)	-72.08*** (-7.02)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1906	3556	1906	3556	1906	3556	1906	3556
BorrowerControls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

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

Table: The Effect of PCentres on Dispersion in Contract Terms

	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

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

Result 3: Less Dispersion in Contract Terms

Education Background, \geq Bachelor vs $<$ Bachelor

Table: The Effect of PCentres on Dispersion in Contract Terms, Education

	cv.R		cv.Amount		cv.Maturity		cv.TimeOnPage	
	(1) \geq B	(2) $<$ B	(3) \geq B	(4) $<$ B	(5) \geq B	(6) $<$ B	(7) \geq B	(8) $<$ 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)	-0.558 (-0.74)	3.251*** (7.97)
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1104	2331	1104	2331	1104	2331	1104	2331
BorrowerControls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Borrowers set more standardized contracts [Click](#).

Result 4: Better Repayment Performance

Following the idea of Franks et al. (2019), 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*** (4.79)	0.21*** (3.59)	-0.15*** (-3.56)	-0.14*** (-3.67)	0.02 (0.59)	0.07* (2.12)	-0.15*** (-4.63)	-0.15*** (-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.

What to Do Next: Second Part

- A model: generalize the results and explain the channel
 - ① A set of public information provided by Pcentres as public goods
$$\Phi = [\text{standard contracts, consequences of default, financial knowledge}]$$
 - ② It's less costly for individual borrowers to learn the information in the set Φ
- Suggestions are welcome

Conclusion

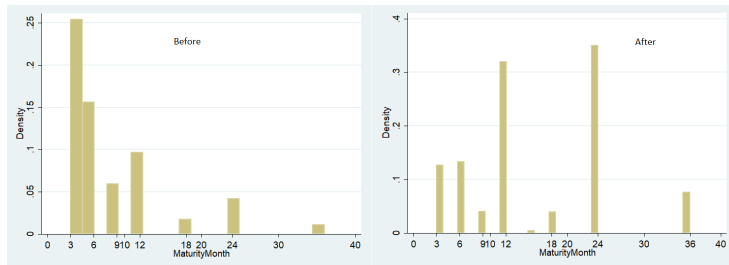
- Pcentres boost the P2P lending market
- Less dispersion of contract terms
- Borrowers spent less time in filling the request time. Lower educated are more affected
- Better repayment performance
- Borrowers become more financial sophisticated
- A novel evidence of government's provision of information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

Table: Exclusion

	FULL SAMPLE	SUCCESS SAMPLE
	(1)	(2)
	D(Newmayor)	D(Newmayor)
GDPgrowth	-0.151 (-0.42)	0.345 (0.46)
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Observations	9758	2444

Back

Figure: Wenzhou Pcentres, maturity of P2P loan requests



Back

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 (-1.39)	-0.00345 (-1.42)	-0.0939** (-3.11)	-0.0890** (-2.91)	-0.0428*** (-4.09)	-0.0446*** (-4.89)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE \times 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.

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

	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)
	(1)	(2)	(3)	(4)
	R	Tot.A	Avg.A	Maturity
Treated	0.911*** (7.31)	-3.348 (-0.60)	-7.069 (-1.64)	4.136*** (6.60)
City FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
Lender FE \times 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.

Table: The Effect of PCentres on Dispersion, Bachelor -, 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	-0.0127*** (-5.19)	-0.0126*** (-5.38)	-0.0539 (-1.54)	-0.0472 (-1.37)	-0.0421** (-3.43)	-0.0435*** (-3.89)
City FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE \times T	Yes	Yes	Yes	Yes	Yes	Yes
Observations	135269	135215	135272	135217	135269	135215
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.

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

	IV(2SLS)	IV(2SLS)	IV(2SLS)	IV(2SLS)
	(1)	(2)	(3)	(4)
	R	Tot.A	Avg.A	Maturity
Treated	1.040*** (8.63)	-2.519 (-0.57)	-5.362 (-1.58)	4.129*** (6.63)
City FE	Yes	Yes	Yes	Yes
Year-Month FE	Yes	Yes	Yes	Yes
Lender FE × T	Yes	Yes	Yes	Yes
Observations	790702	790704	790704	790702
BorrowerControls	Yes	Yes	Yes	Yes

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