

# Marketplace Lending, Information Efficiency, and Liquidity

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Financial Stability and FinTech, Washington DC, 30 November, 2017

# A trend in P2P funding

- ▶ From auctions to posted prices
  - ▶ Einav et. al. (2013): eBay
  - ▶ Wei & Lin (2016): Prosper
- ▶ This paper: UK's Funding Circle (FC)
  - ▶ presently: from posted prices to fixed portfolios
- ▶ We study the FC's price-discovery process
  - ▶ private data: 34m observations, all the submitted orders
- ▶ Additional points of interest
  - ▶ the UK has a longer record of P2B lending
  - ▶ better information sharing systems
    - ▶ company house
  - ▶ tighter bankruptcy laws

# Main findings

- ▶ Price discovery: informative, yet not efficient
  - ▶ prices predict default, but tend to over react to the risk
    - ▶ 1% increase in the lending rate predicts only 0.5% in default risk
- ▶ Mispricing is correlated with liquidity
  - ▶ lending rate is high in periods of *systemic* high demand
- ▶ Algorithmic trading plays a pivotal role
  - ▶ 50% of the funding
  - ▶ mixed effect on pricing
    - ▶ mitigates over reaction
    - ▶ albeit at a 60bp discount passive investment

# Funding Circle: general information

Since 2010Q4: online lending platform

- ▶ up to 2015Q3: auctions
  - ▶ sampling window: up to 2105Q1, 7,516 auctions
  - ▶ performance up to 2016Q4
  - ▶ excluding 875 auctions rejected by the borrower
    - ▶ a small number of interest only loans
- ▶ Weekly growth rate of loanbook
  - ▶ mean: 2.4%; SD: 1.2
  - ▶ loanbook at sample close: £0.46bl; currently: £2.7bl

# Descriptive statistics

- ▶ 22k investors
  - ▶ funding provided by top decile: 83%
  - ▶ some of which are institutional investors
- ▶ FC has no exposure to the loans
  - ▶ except for 1% service fee on all loan repayments

	mean	med	SD	min	max
loan size (£000)	57	50	40	5	516
maturity (months)	44	36	14	6	60
age of SME (years)	12	9	10	0	107
length of auction (hours)	157	168	15	0.1	504
share of top lender (%)	8	10	7	0.2	83
share of top 5 lenders (%)	18	17	11	0.7	100
share of top 20 lenders (%)	29	27	14	0.7	100
share of autobid (%)	48	50	18	0	99
number of active investors	200	176	127	2	985

# Prices, default, loss given default (LGD)

- ▶ Basic default equation (OLS):

$$D\_default_{i,t} = \alpha + \beta_S \times D\_score_{i,t} + \beta_Q \times D\_quarter_{i,t} + \varepsilon_{i,t},$$

$\alpha$ : *quarterly* default probability (adjusted for amortization)

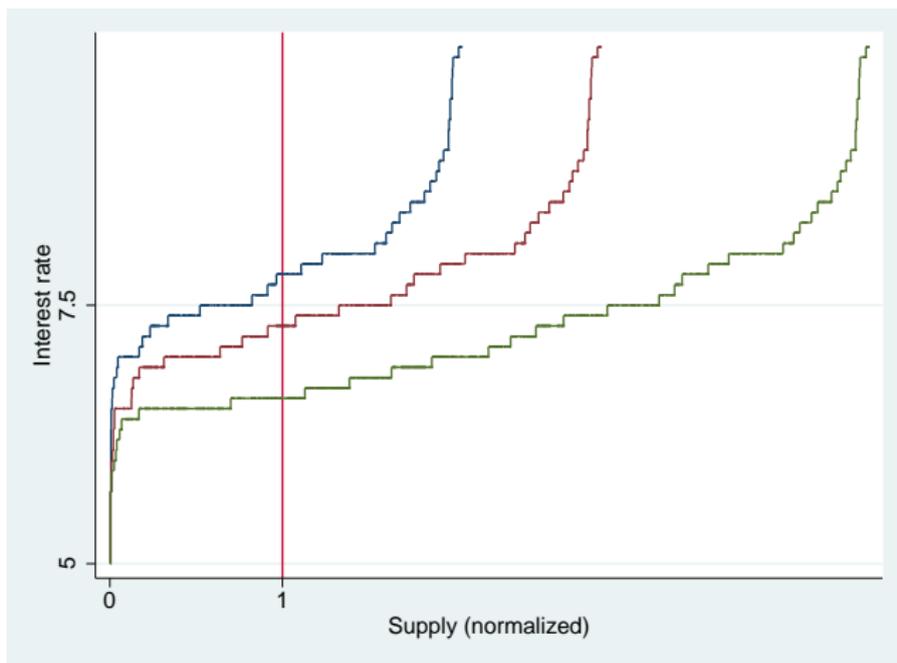
	interest rates regressions		default regressions		
			(3) default dummy	conditional on default	
	(1) average close	(2) marginal close		(4) <u>payments to default</u> <u>payments due</u>	(5) <u>recoveries post default</u> <u>balance remaining</u>
constant (A);	8.472*** (0.100)	8.967*** (0.165)	0.008*** (0.001)	0.436*** (0.061)	0.141*** (0.052)
dummy: AA rated	-1.164*** (0.032)	-1.096*** (0.053)	-0.004*** (0.001)	0.030 (0.043)	-0.045 (0.036)
dummy: B rated	0.976*** (0.024)	1.002*** (0.040)	0.003*** (0.001)	0.023 (0.023)	0.004 (0.019)
dummy: C rated	1.987*** (0.025)	1.986*** (0.042)	0.003*** (0.001)	-0.011 (0.024)	-0.014 (0.020)
dummy: D rated	3.713*** (0.036)	3.423*** (0.060)	0.007*** (0.002)	-0.048 (0.030)	0.001 (0.026)
Quarter FE	YES	YES	YES	YES	YES
$R^2$	0.787	0.618	0.002	0.124	0.131
$N$	7,455	7,455	81,049	671	671

## Recovery rates given default: high

- ▶ Loans are virtually unsecured
  - ▶ typically for the UK: recovery rates are extremely low
- ▶ The vast majority of loans are guaranteed
  - ▶ typically by the SME owner
- ▶ FC, as “delegate monitor” on behalf of the investors
  - ▶ can impose personal bankruptcy on the owner
    - ▶ owners cannot serve as directors
    - ▶ cannot open a bank account
- ▶ Current strategy: reschedule the loan and aim at 50% recovery rate
  - ▶ over five years

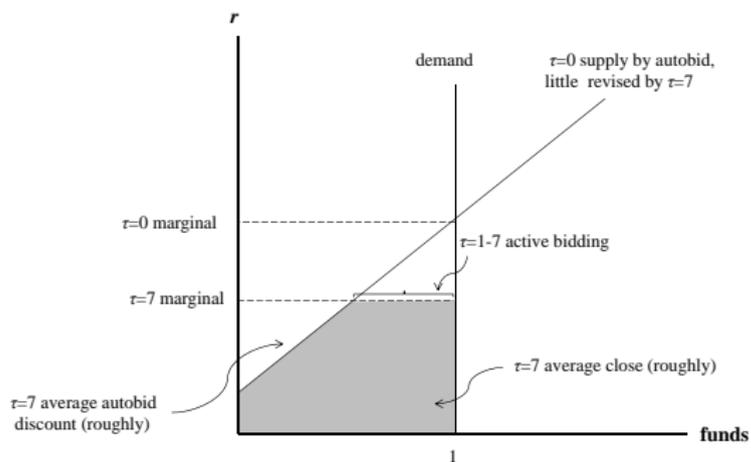
The auction: multi unit, limit orders, no recourse, discriminating

- ▶ Descending  $r$ , marginal rate  $\geq$  average rate

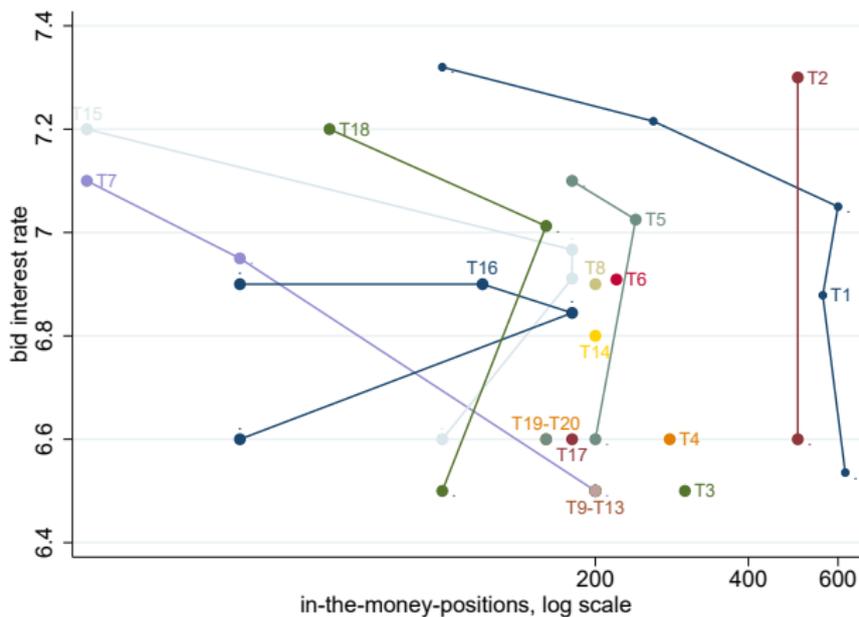


# Auction anatomy

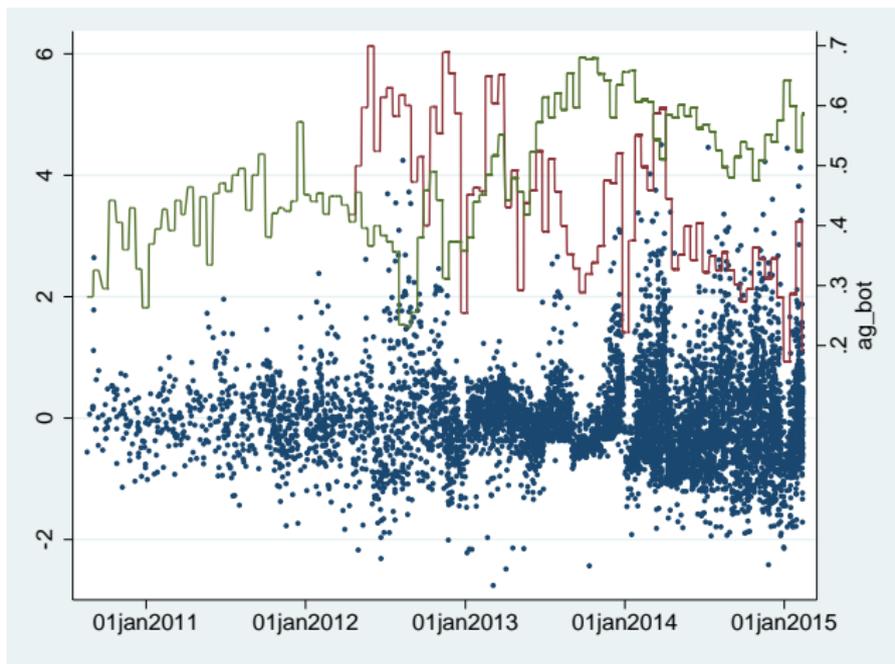
- ▶ Open order book  $\Rightarrow$  active investors bid marginal



# Bidding strategies: auction 2408, top twenty investors



# Deviation from score, loanbook growth, aggregate autobid



# “Theory”

- ▶ Autobid and heavy investors serve as a competitive, risk-neutral market making industry
  - ▶ agnostic: exact identity, the nature of the signal
- ▶ EMH:  $\pi_i = \beta^* s_i$ 
  - ▶ OLS regression

$$\pi_i = -\rho + \beta^r r_i + \gamma x_i + \varepsilon_i \quad \beta^r \neq 1, \quad \gamma \neq 0.$$

- ▶ Allow for a  $\Delta$  deviation from efficiency:  $\pi_i = (\beta^* + \Delta) s_i$ 
  - ▶ over or under reaction to the signal
- ▶ In which case  $\varepsilon$  is no longer orthogonal to  $r$ 
  - ▶ however

$$E\beta^r \approx 1 - \frac{\Delta}{\beta^*}$$

# Baseline regression

	(1)	(2)	(3)	(4)	(5)	(6)
Average Interest Rate	0.530*** (0.101)	0.662* (0.376)	0.649* (0.377)			
Marginal Rate				0.293*** (0.059)	0.428 (0.319)	0.430 (0.321)
Aggregate Growth Rate		-0.003** (0.001)	-0.002* (0.001)		-0.003** (0.001)	-0.002* (0.001)
Rate*Aggregate Bot Funding		-0.188 (0.735)	-0.433 (0.741)		-0.216 (0.624)	-0.408 (0.631)
Aggregate Bot Funding		-0.001 (0.030)	0.007 (0.030)		0.000 (0.027)	0.006 (0.028)
Early Closure			0.003*** (0.001)			0.004*** (0.001)
Floor Auction			-0.001 (0.001)			-0.000 (0.001)
1 Over LM	-0.024*** (0.006)	-0.025*** (0.006)	-0.021*** (0.007)	-0.018*** (0.006)	-0.019*** (0.006)	-0.015** (0.006)
Constant	0.034*** (0.011)	0.038** (0.018)	0.030* (0.018)	0.031*** (0.010)	0.035** (0.017)	0.027 (0.016)
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.002	0.002	0.003	0.002	0.002	0.002
N	80,529	80,529	80,529	80,529	80,529	80,529

## Other checks

- ▶ The over reaction problem is exacerbated over time
- ▶ The signal is informative both within and out of the credit-score band
- ▶ Auctions that close off-peak (3pm to 7pm) are liquidity short
  - ▶ over pricing, not corrected by the autobid
- ▶ Liquid auctions (identified by flat supply curves) hardly over react
- ▶ No significant difference between high and low beta industries

## Discussion & conclusions (I)

- ▶ Auctions reveal information
  - ▶ mispricing effect could have been mitigated
- ▶ Queue execution towards liquid markets
  - ▶ allow companies to bid for time priority
- ▶ Make autobid more sensitive
  - ▶ to closing hour
- ▶ Increase premium to active investment (above 60bp)
  - ▶ increase minimum bid above £50
- ▶ As system matures, fund inflows and outflows become less erratic

## Discussion & conclusions (II)

- ▶ Why did FC avoid this line of action?
  - ▶ interest in volume
    - ▶ like any other intermediary
- ▶ Duffie and Jackson (1989): efficient market design
  - ▶ maximize volume
  - ▶ monopoly profits
- ▶ However
  - ▶ borrowers could not diversify execution risk
  - ▶ 7,516 is a small number by the standards of big data
    - ▶ with a substantial learning delay
  - ▶ race to build up the biggest network