

# Technological Disruption of Modern Financial Intermediation

Amit Seru

Stanford GSB and Hoover

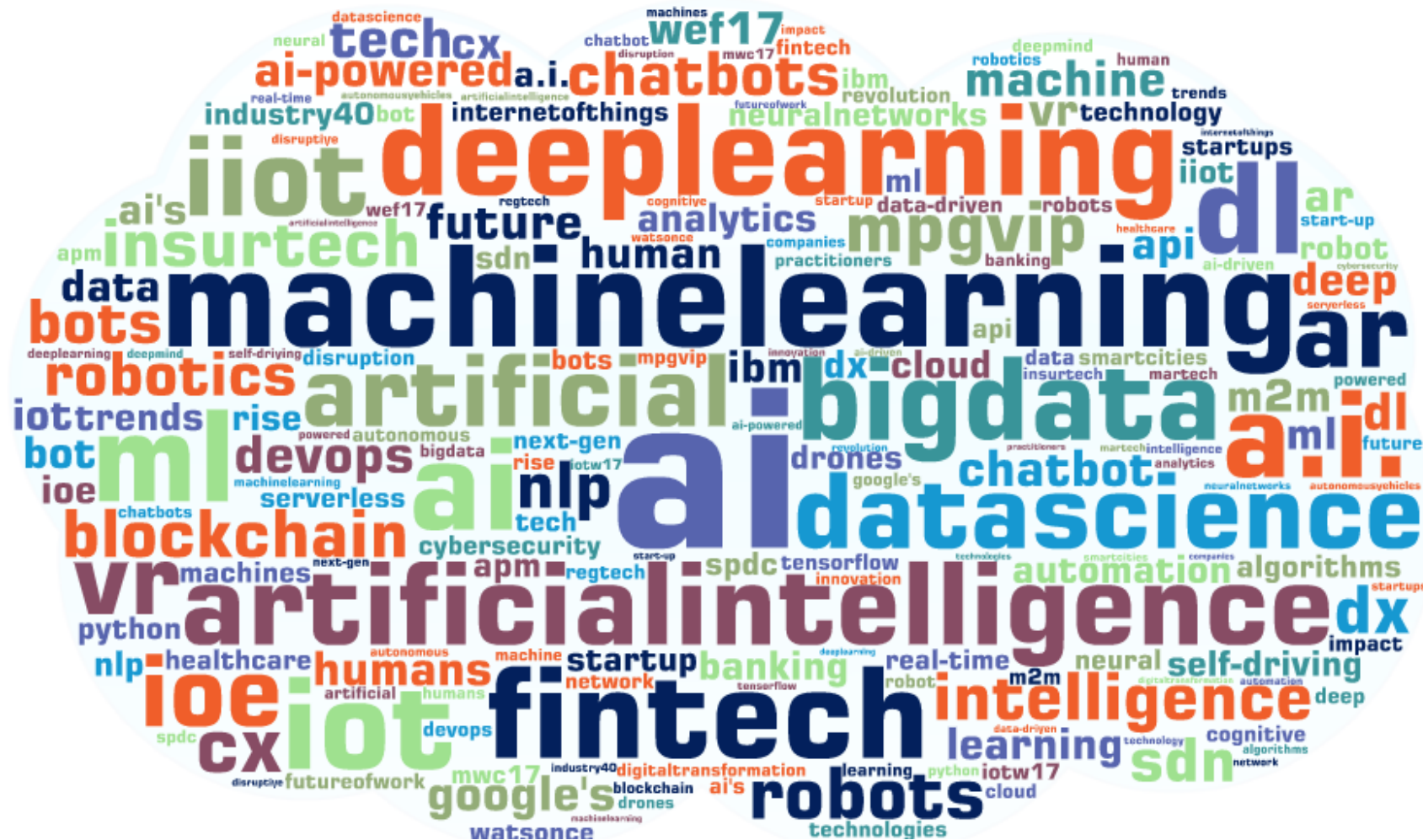
ABFER Dinner

May 2022

*Data is the new oil and analytics is the combustion engine*

# Technology?

## DATA BASED TECHNOLOGICAL REVOLUTION



# Technology?

## ❑ Higher Quality

- Newer products (convenience)
- Higher quality → more market share

## ❑ Lower Costs

- More efficient/ lower regulatory burden
- Lower costs → more market share

## ❑ Better Risk Assessment

- Better models/Big Data
- Enhanced screening/pricing of risk → more market share

BETTER QUALITY

**T**echnology? Quality



# Technology? Quality



[Talk to Us](#) | [Sign Out](#)

**1** My Priority

2 My Current Mortgage

3 My Home Info

4 Who's on the Loan

5 My Money

6 Government Questions

7 My Credit

8 My Solution

9 See If I'm Approved

## Why do you want to refinance?

Pick one to start.

Lower My Monthly Payment

Pay Off My Mortgage Faster

Take Cash Out of My Home

Save & Continue

[Quicken Loans](#) [Zing Blog](#) [Rocket Loans](#) [Talk to Us](#) [Opt Out](#)

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HIGHEST IN CUSTOMER SATISFACTION IN THE U.S. - J.D. POWER



# Technology? Quality



Talk to Us | Sign Out

- ✓ My Priority
- ✓ My Current Mortgage
- ✓ My Home Info
- ✓ Who's on the Loan
- ✓ My Money
- ✓ Government Questions
- ✓ My Credit
- ✓ My Solution
- ✓ See If I'm Approved
- 10** Lock My Interest Rate

## Your rate is now locked!

### Property Address:

123 Main Street, Detroit, MI, 48226

### Here's what you've locked in:

Interest Rate	4.125%
Loan Type	30-Year Fixed
Discount Points	0.12 (\$264.56)
New Loan Amount	\$211,650
<b>Your Rate Lock Expiration Date</b>	<b>01/06/2016</b>

### The Steps to Get You to Closing

- Use our powerful online tools to get you through the mortgage process with ease.
- Complete your simple to do list by 11/25/2015.

Save & Continue

# Technology? Quality

Mortgage Customer  
Satisfaction Increases as  
Lenders Adopt New Technology,  
Improve Efficiency

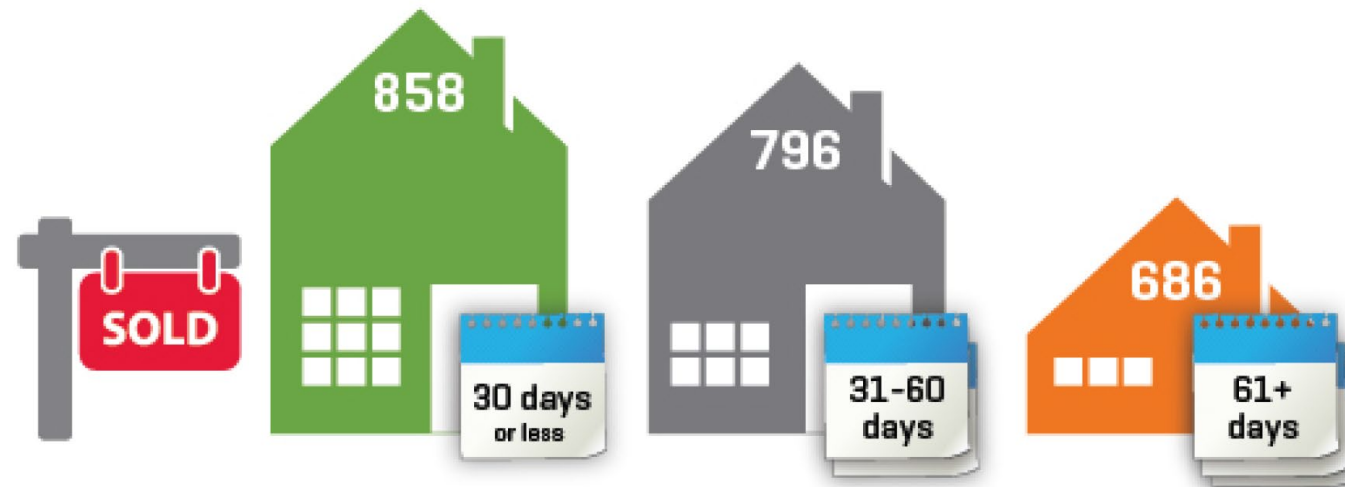
2015 U.S. Primary Mortgage Origination Satisfaction Study | J.D. Power



# Technology? Quality

The Longer the Mortgage Process,  
The More Customer Satisfaction Declines

*Overall satisfaction based on a 1,000-point scale*

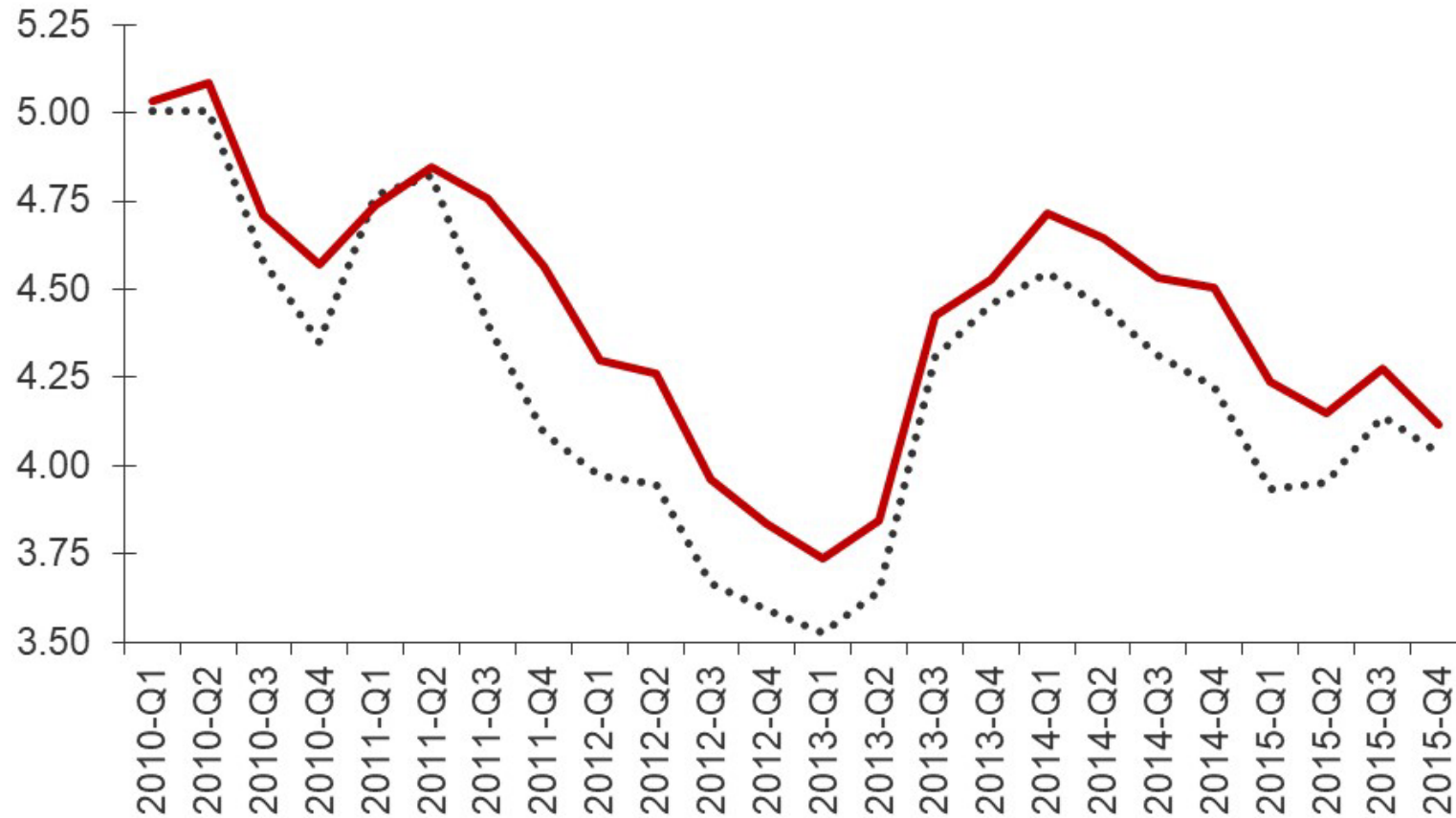


*Total Time from Initial Application to Closing*

# Technology? Quality

□ Convenience/ Quality

WILLINGNESS TO PAY



# iBUYERS

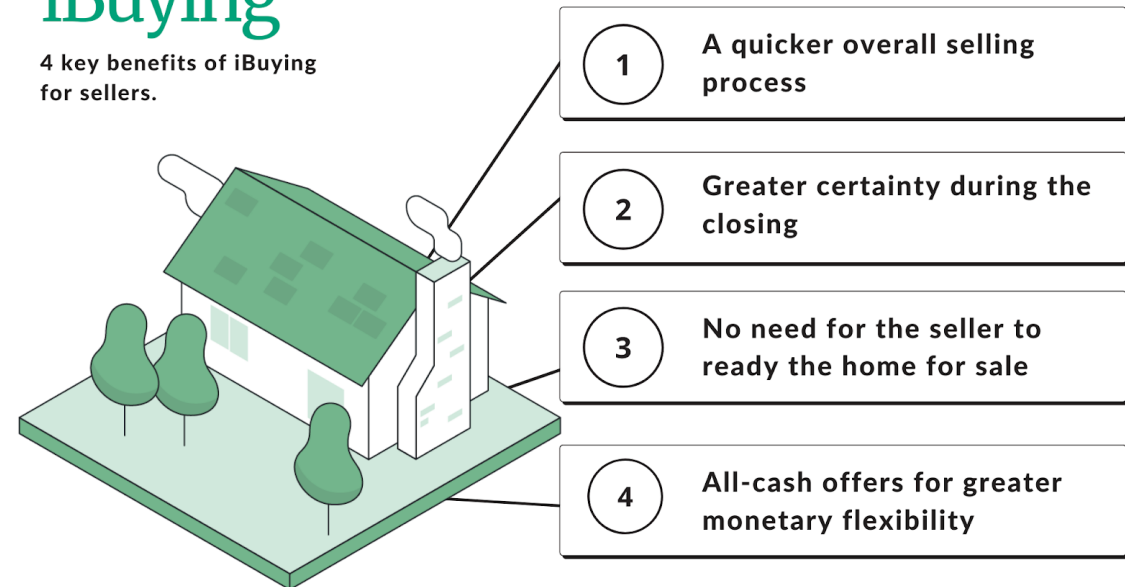
- ❑ Intermediaries that buy and sell houses “instantly”
- ❑ Examples:
  - Opendoor, Offerpad,...
  - Emphasize technology to value quickly
  - Own houses on balance sheet
  - Charge a “fee” for convenience

# Opendoor

Sell your home from the  
comfort of your couch

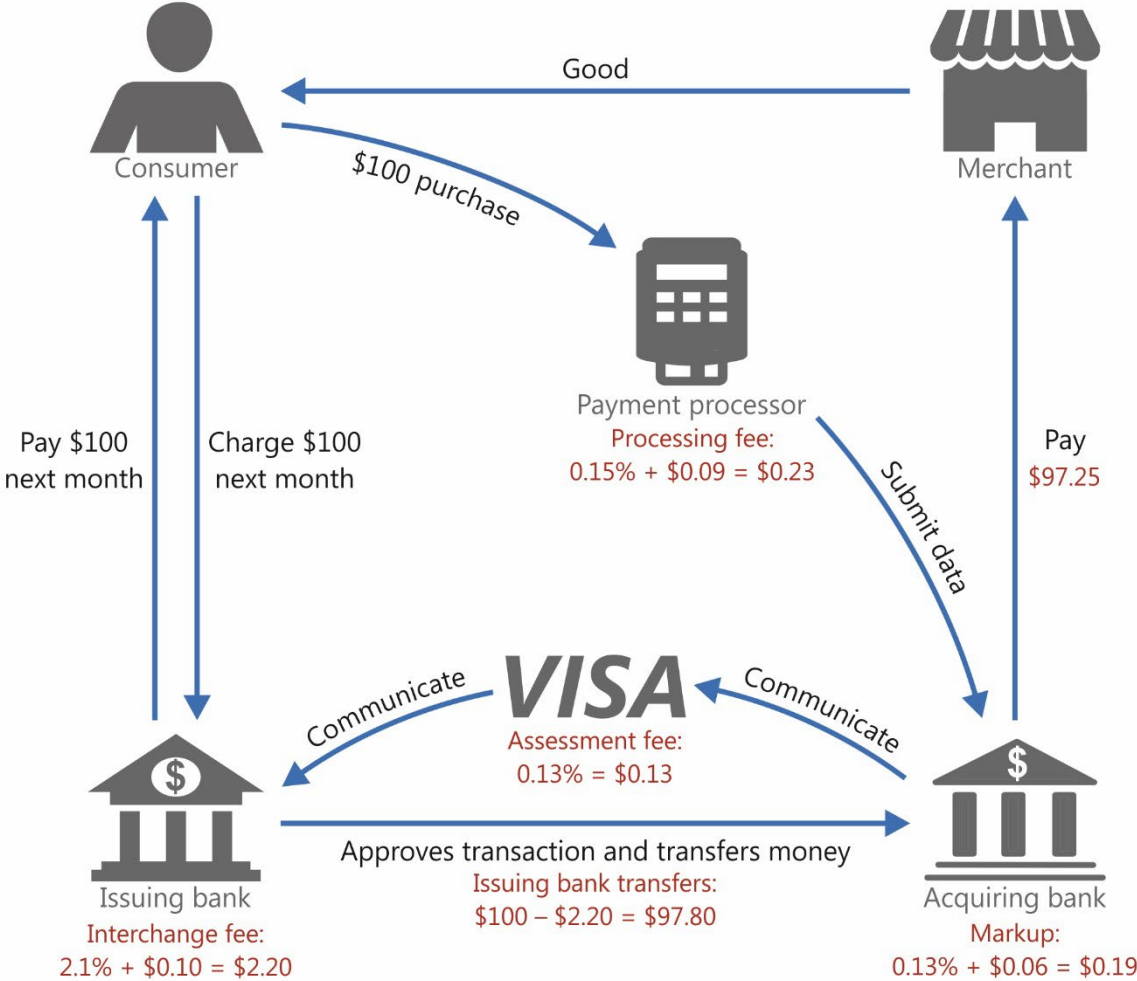
## Benefits of iBuying

4 key benefits of iBuying  
for sellers.

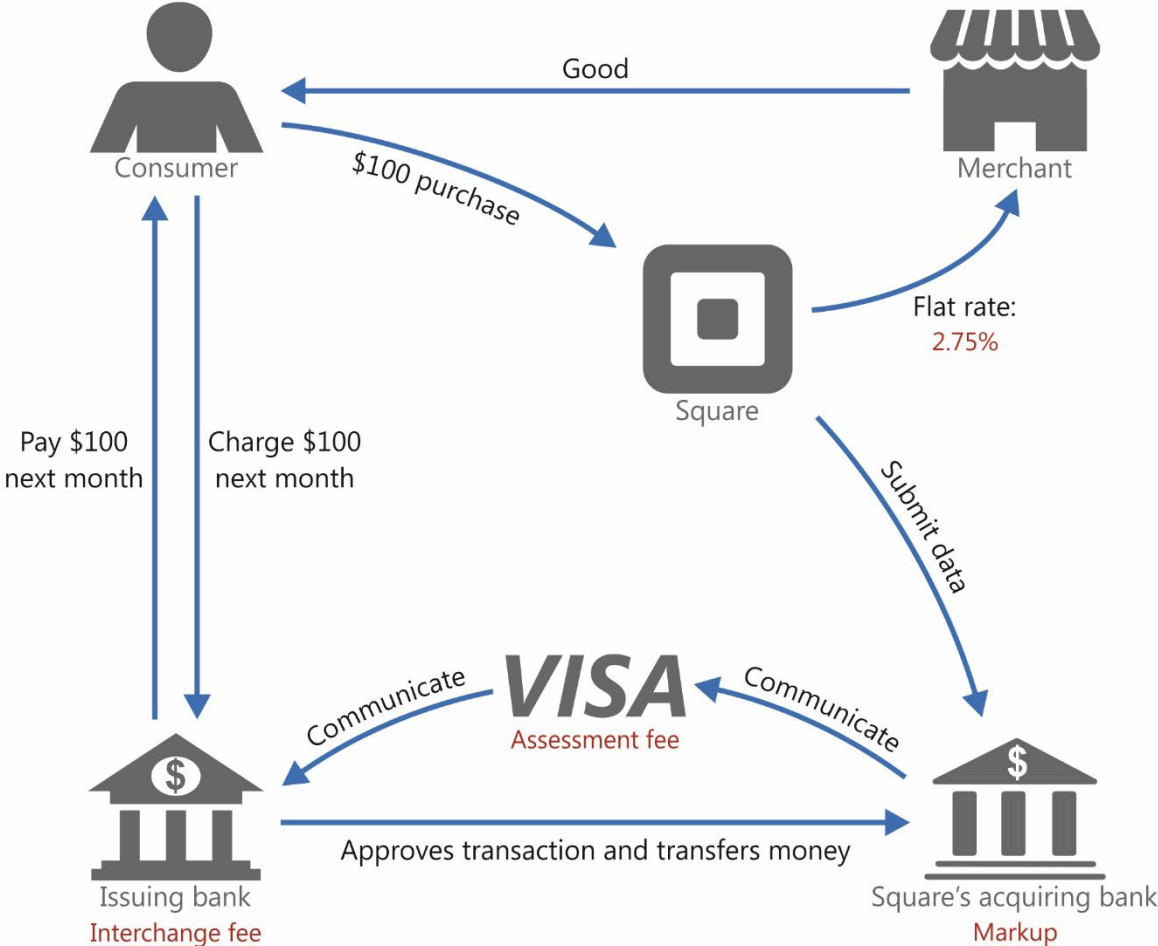


LOWER COSTS

# Technology? Costs



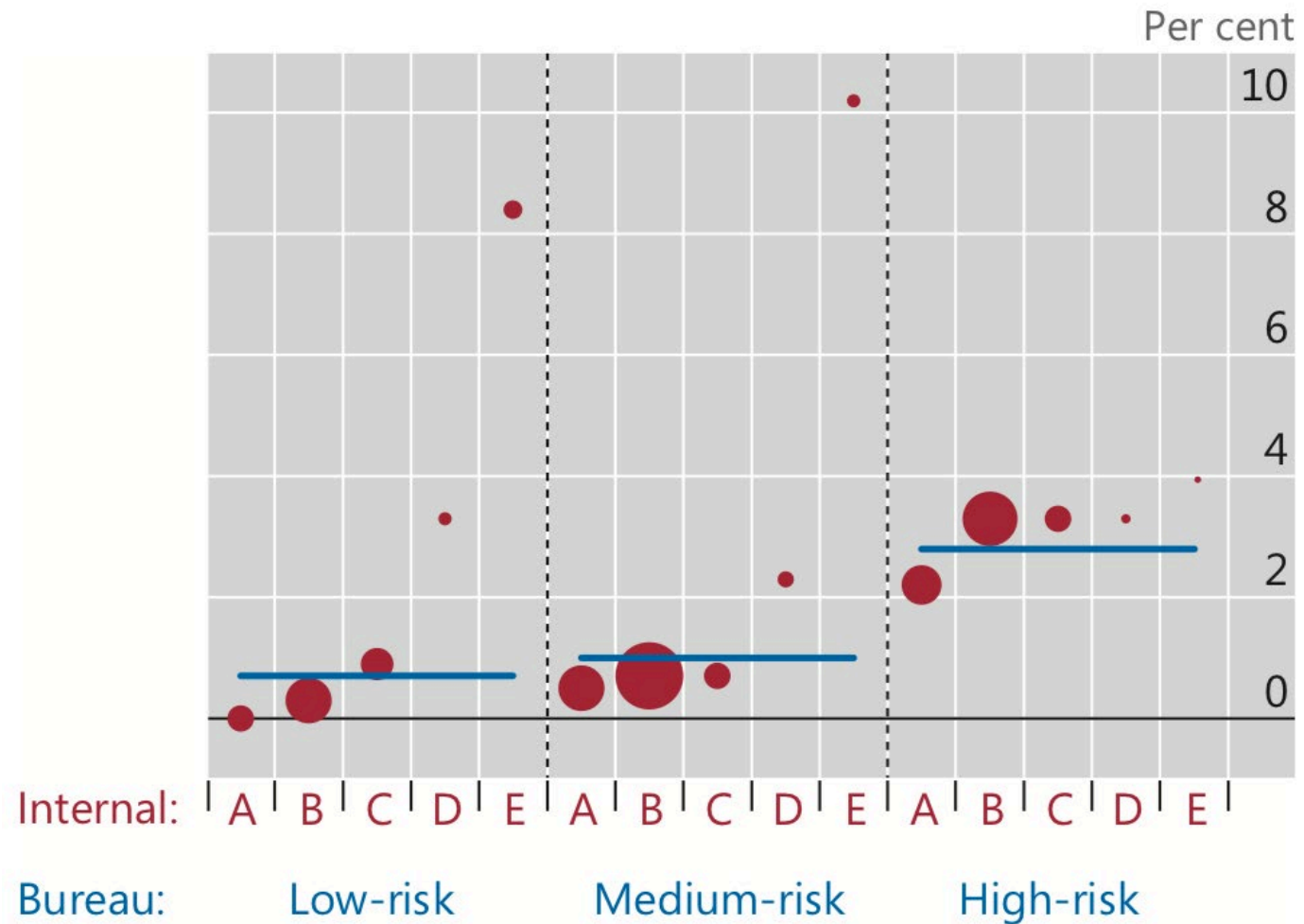
# Technology? Costs



# BETTER SCREENING

# Mercado Libre

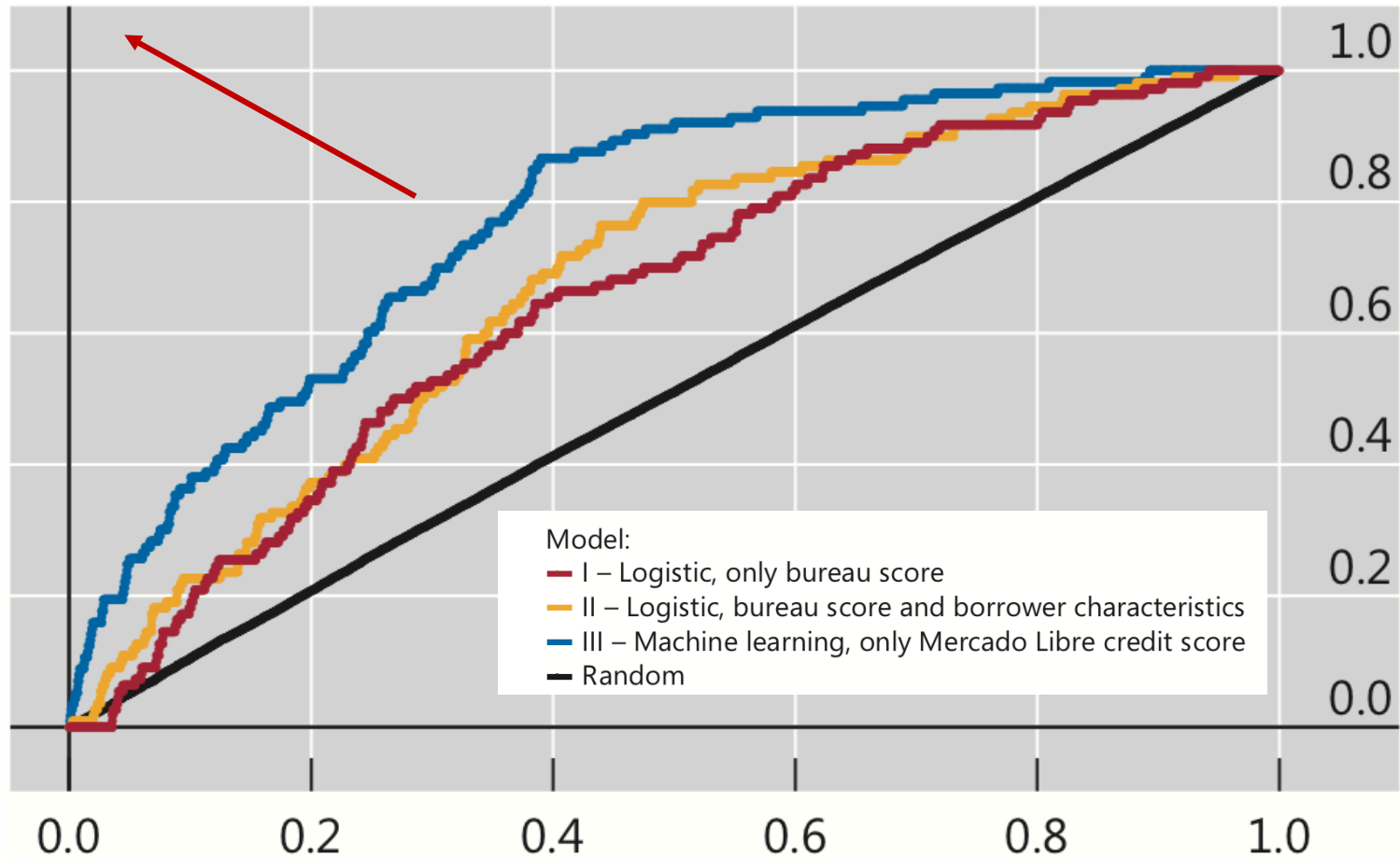
Loss rate<sup>1</sup>








# Mercado Libre

Receiver operating characteristics (ROC) curve<sup>2</sup>

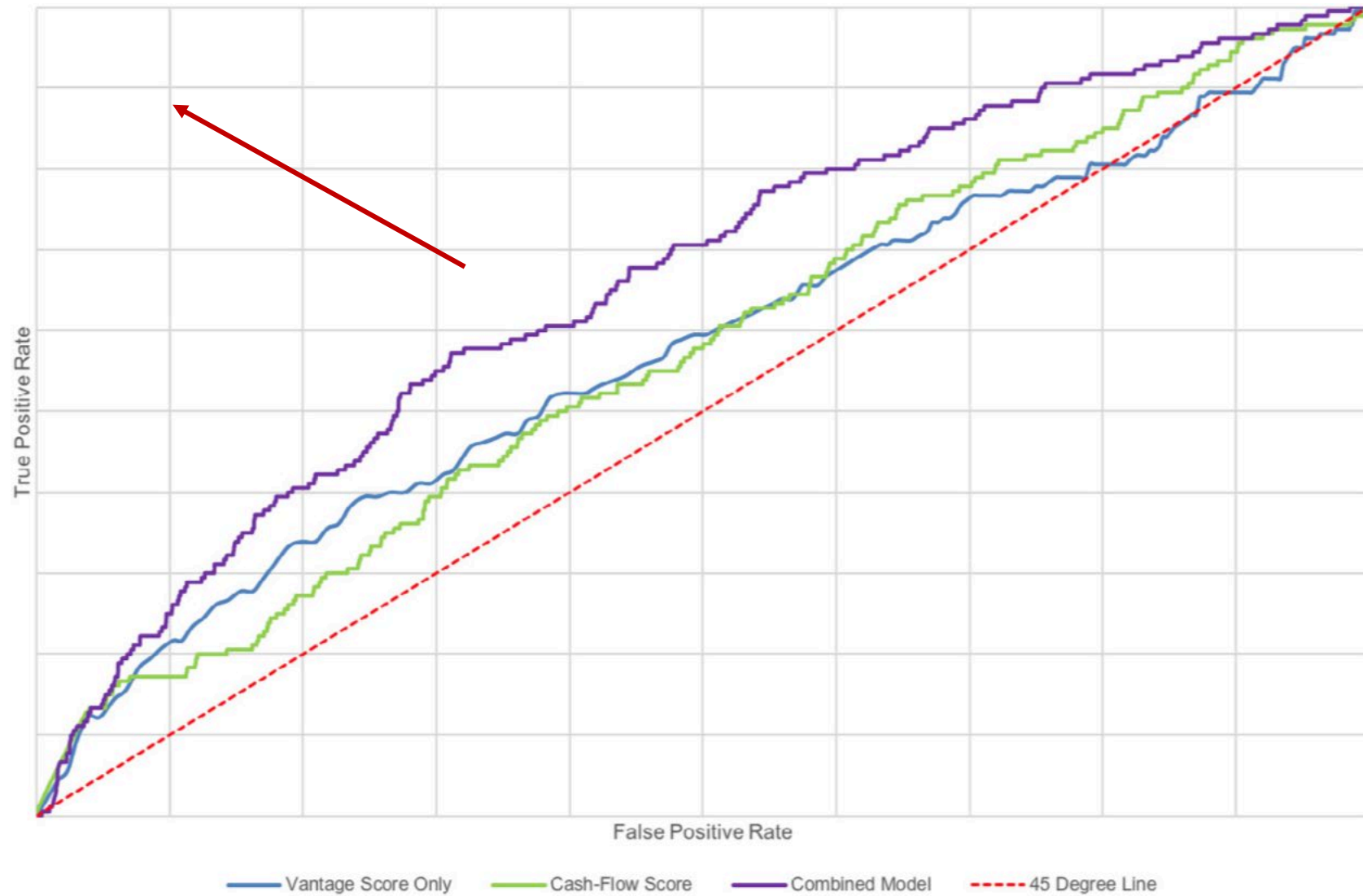




## How a Kabbage line of credit works:

<p>1</p> <p>Apply anywhere in minutes</p>	 <p>Enter basic business information and link your revenue data online or through our mobile app.</p>
<p>2</p> <p>Get a decision right away</p>	 <p>We'll review your business performance to let you know how much working capital you can access.</p>
<p>3</p> <p>Start using your funds today</p>	 <p>Take the amount you need now and come back whenever you need more capital to grow your business.</p>

# Kabbage



# Similar Examples Everywhere: SoFi

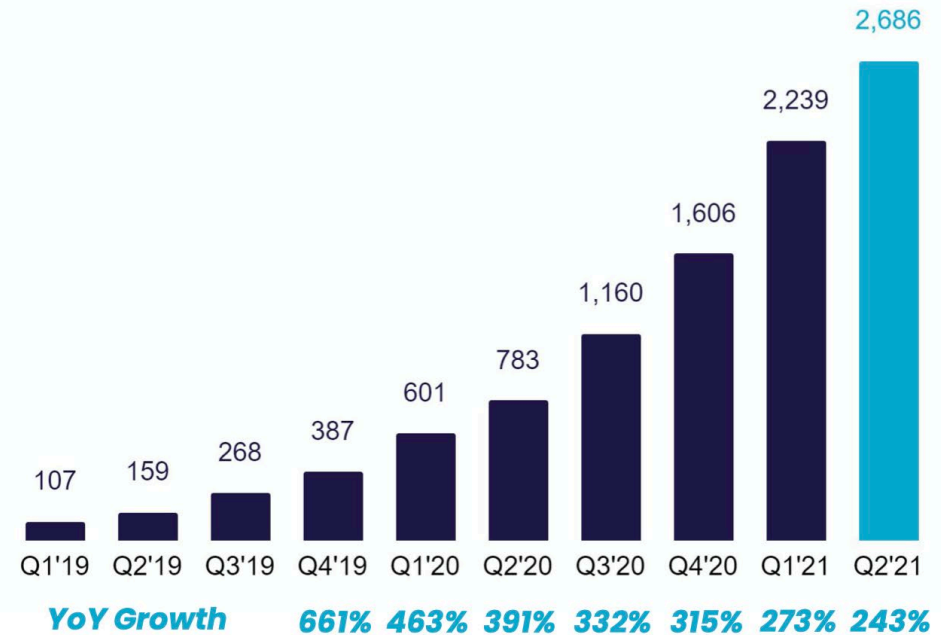
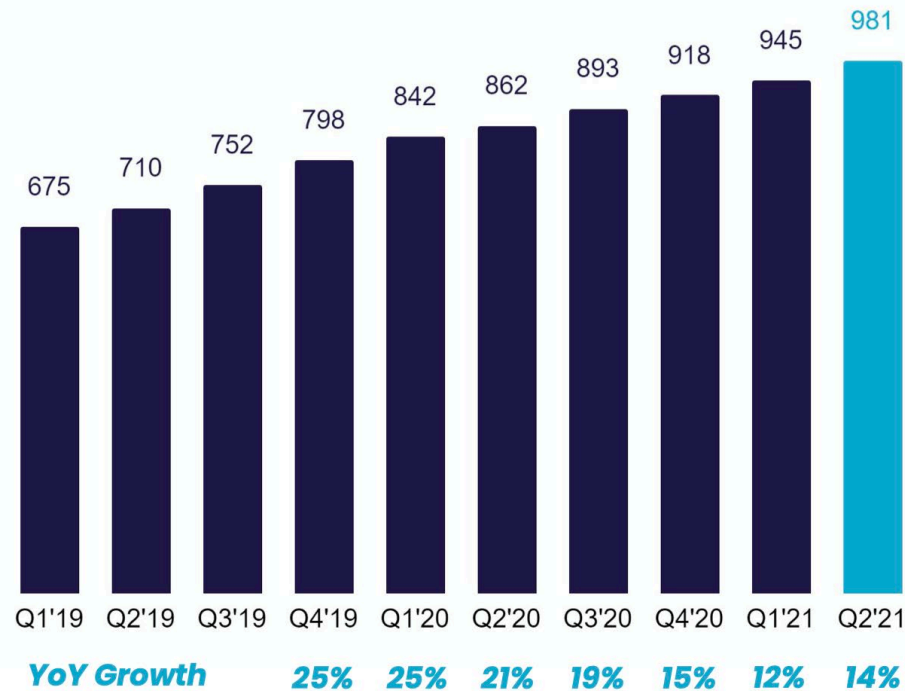
## Lending and Financial Services Products



Growth in products and members driven by Financial Services Products, which reached 2.7M (+243% or 1.9M YoY)

Lending Products (000s): +14% YoY to 981K

Financial Services Products (000s): 243% YoY Growth



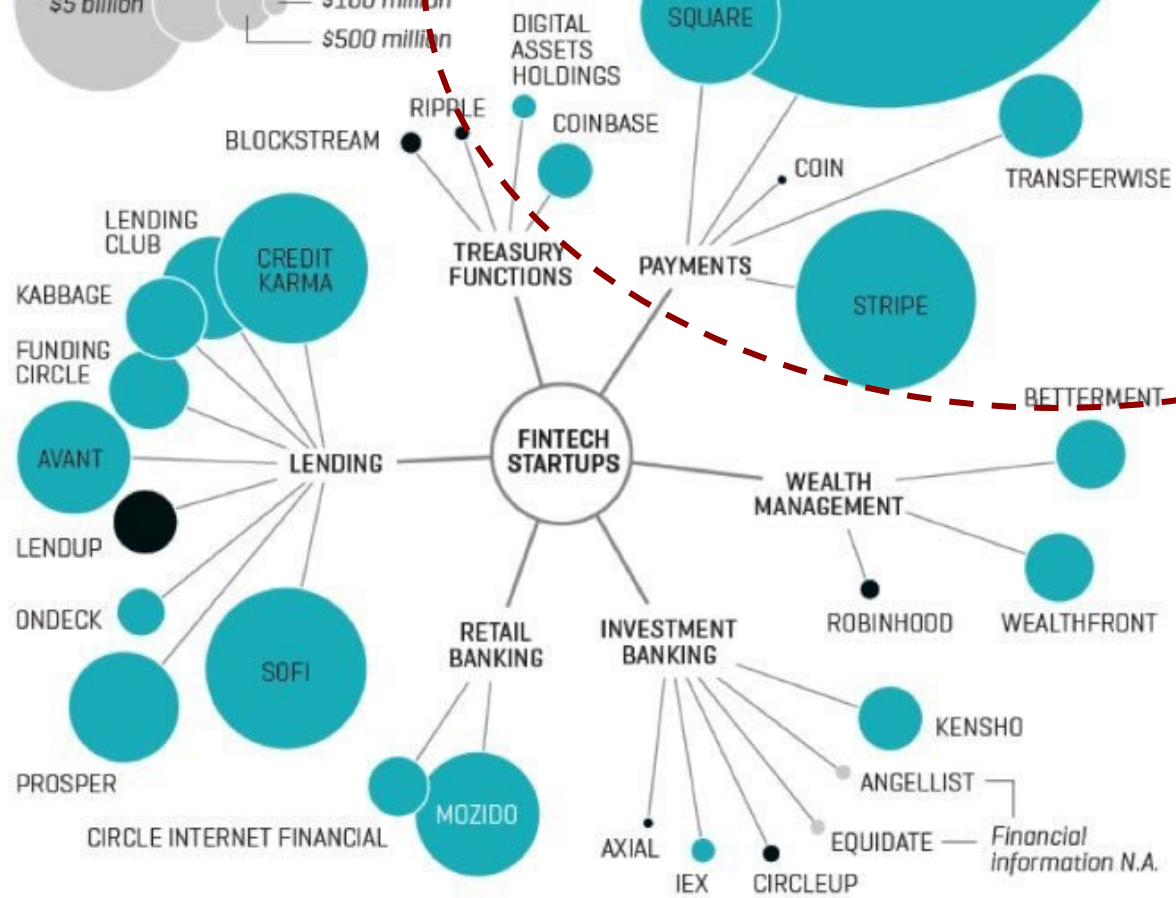
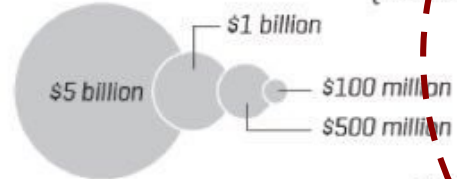
# UNBUNDLE AND BUNDLE

# Unbundle

## DISRUPTION FROM EVERY DIRECTION

SIZE OF CIRCLE SHOWS:

● ESTIMATED VALUATION ● FUNDS RAISED [VALUATION N.A.]



# Households

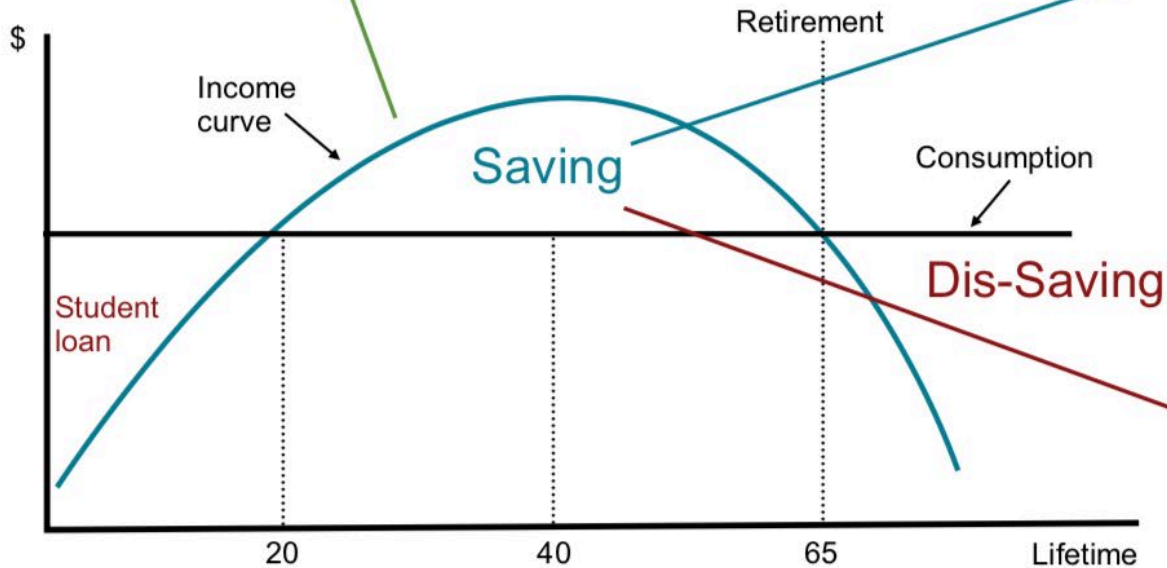
Innovations in Student Debt Repayment:



Summer



earnest



Mortgage and Lending:



Retirement Savings:



# Payments (data) help in “customization”

Consumers can be classified based on their attitudes and preferences towards digital payments.

## Share of respondents per segment

### Digitally averse

Half have performed a digital payment

Strong preference for traditional methods (cards, cash, checks) on retail purchases

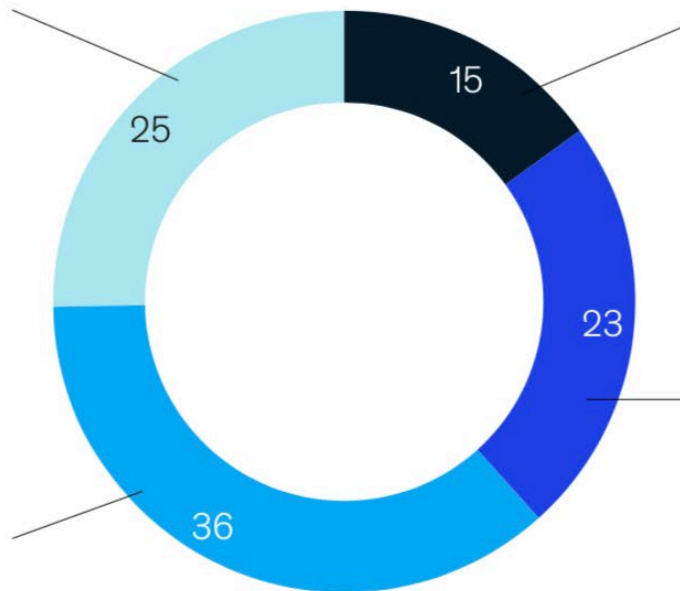
Heavy security concerns, low trust in non-bank digital wallets

### Offer junkies

Actively seek best price via coupons, offers

Prefer to make digital payments through a browser (to enable comparison shopping)

Strong interest in ability to pay in points for digital purchases



### Tech savvy

Active adopters of latest technology, including alternative payments (eg, digital point-of-sale loans, social-media-based payments)

Apps are preferred digital payments channel

### Convenience seekers

Most active adopters of digital payments; more than 60% make more than one digital transaction per month

Interested in using a digital wallet in the same way as a physical one (eg, storing balance, coupons, tickets, cards)



# Payments (data) help in “customization”

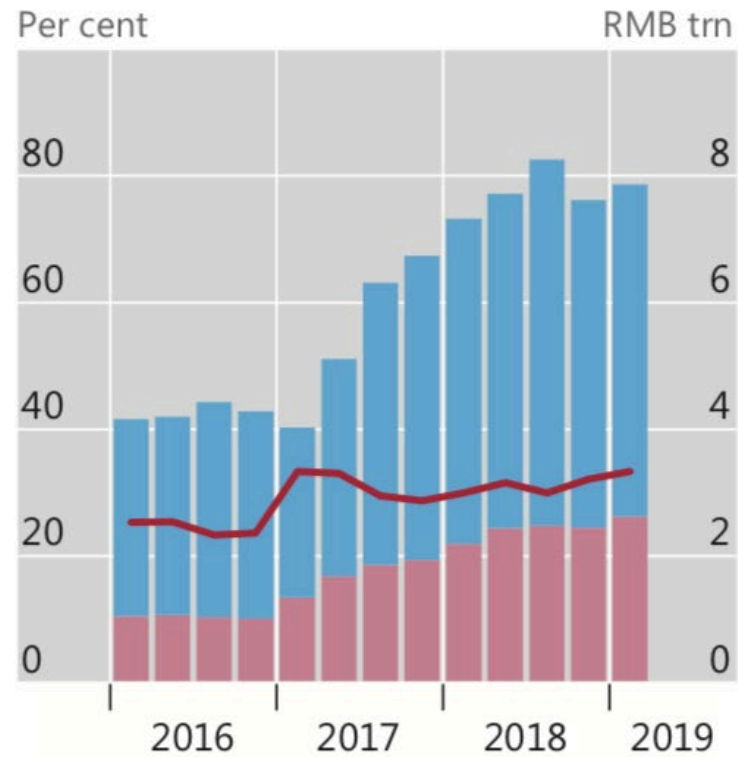
“If banks do not change, we shall change them”

Jack Ma (in 2012)



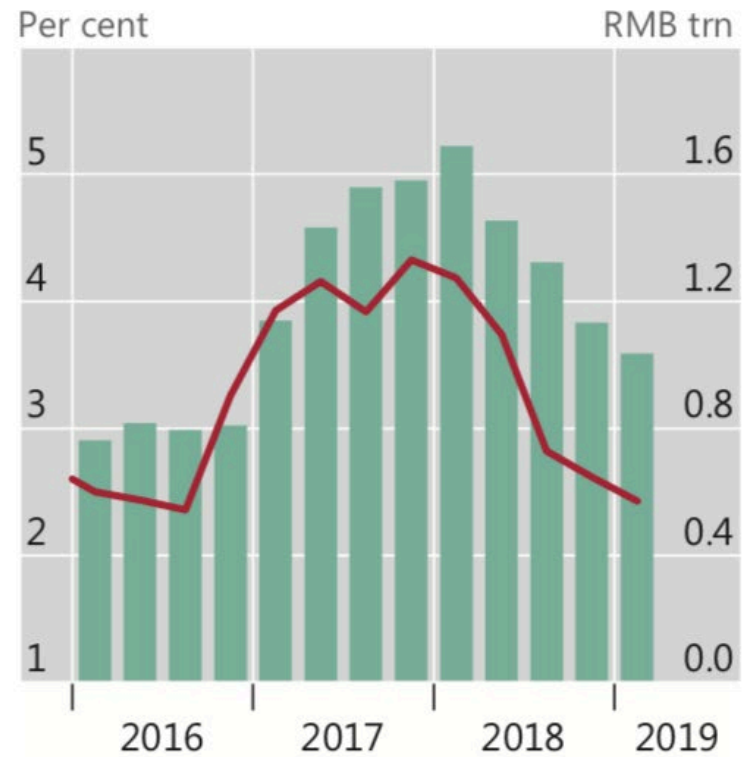
# Expansion after entry

Money market funds in China – assets under management (AUM)



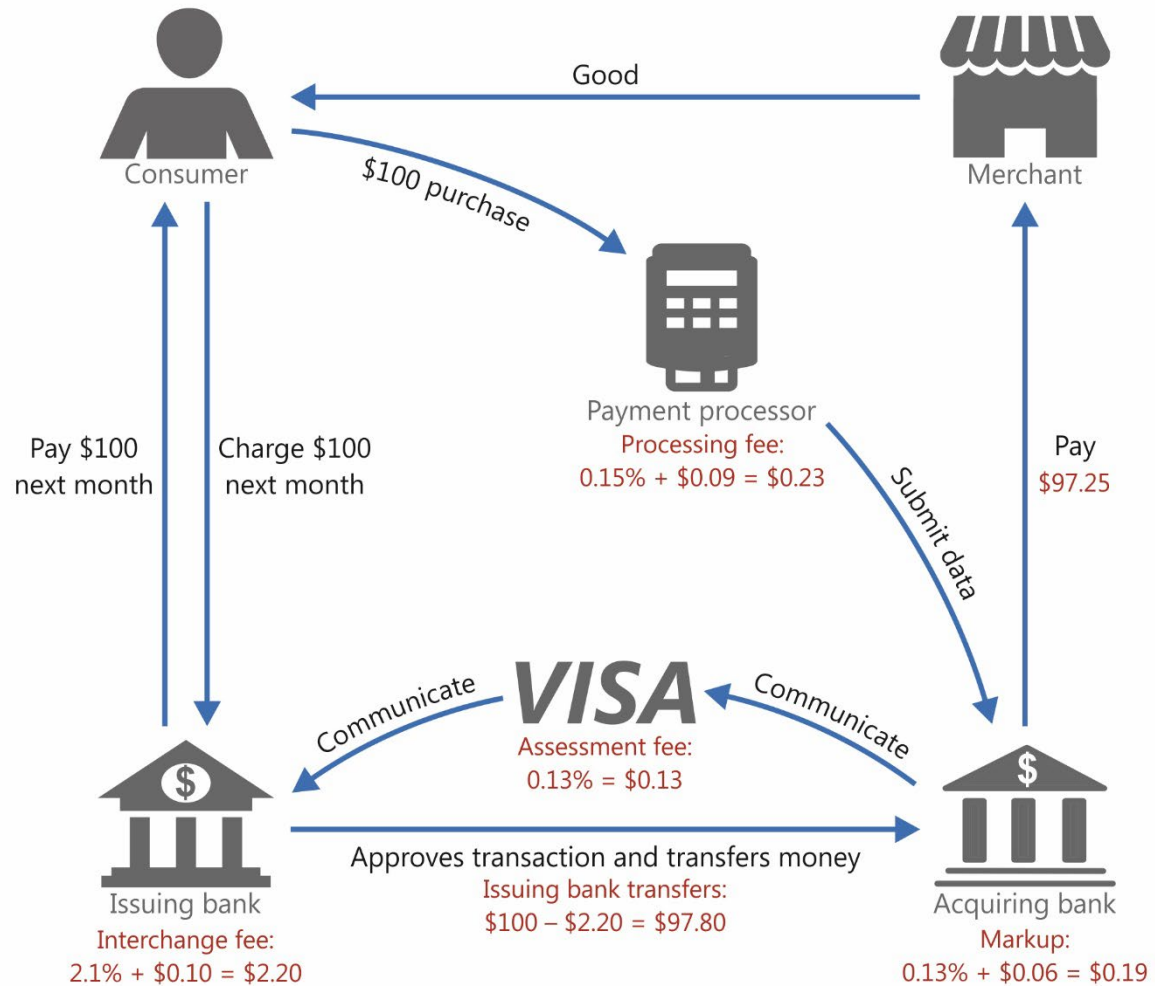
Lhs: — Share of big techs  
 Rhs: — Other MMFs  
 — Big techs<sup>1</sup>

Yu'e bao

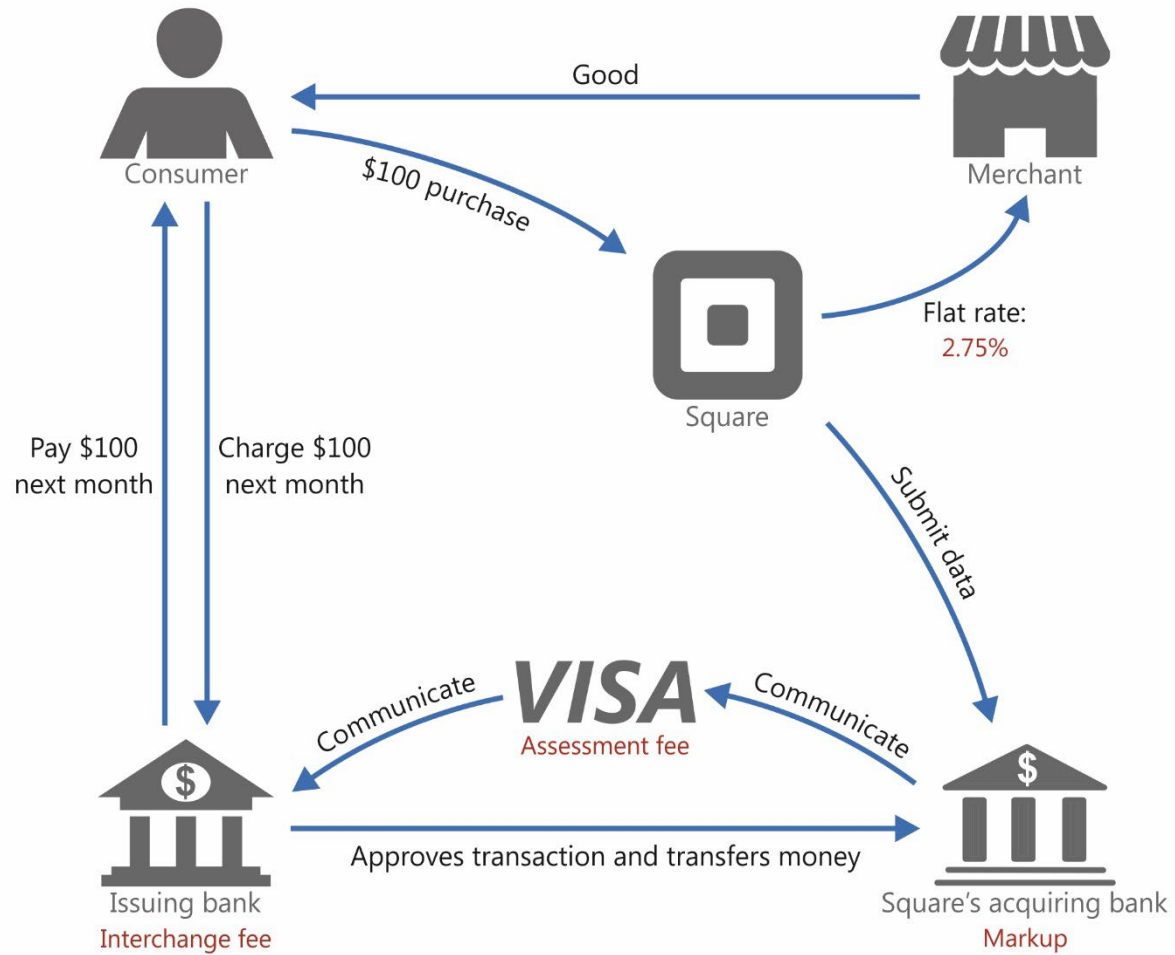


Yu'e bao: — Returns (lhs)  
 — AUM (rhs)

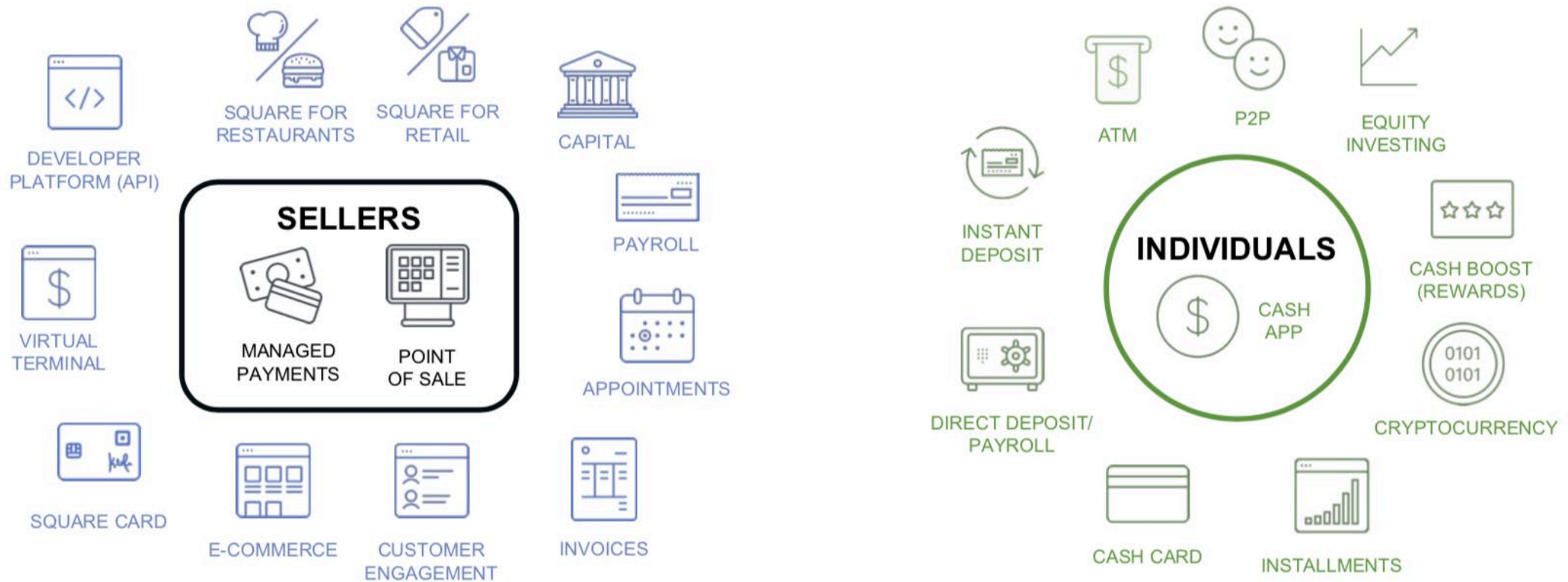
# SMEs



# SMEs



# Expansion after entry (like before)...



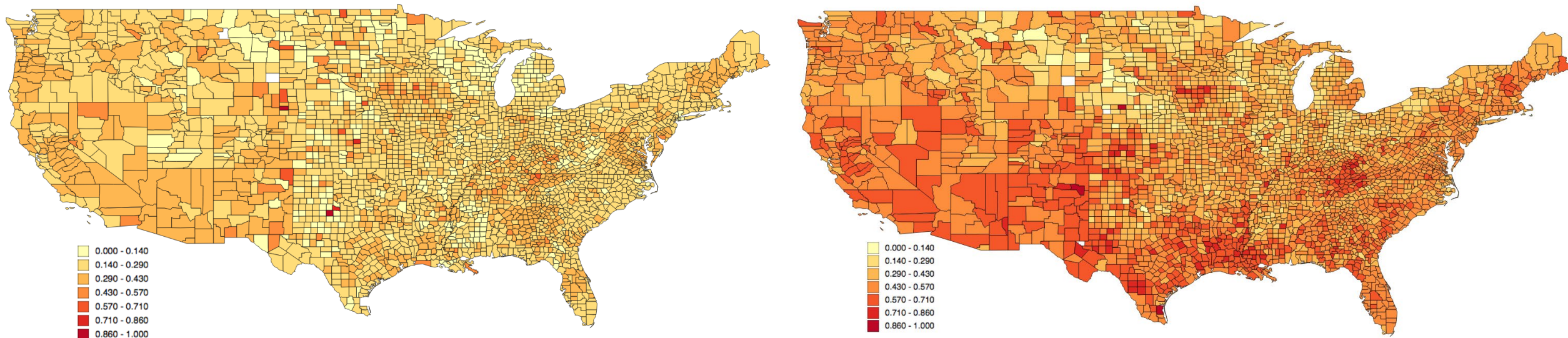
REGULATION?

# Regulation?

## □ Fintechs very “lightly” regulated

- Bank regulatory burden gone up: Capital charges, Lawsuits, supervisory intensity
- Banks retreated and shadow banks entered in markets where regulatory burden increased

### CHANGES IN GEOGRAPHIC PENETRATION (2008-2015)



# Regulation?

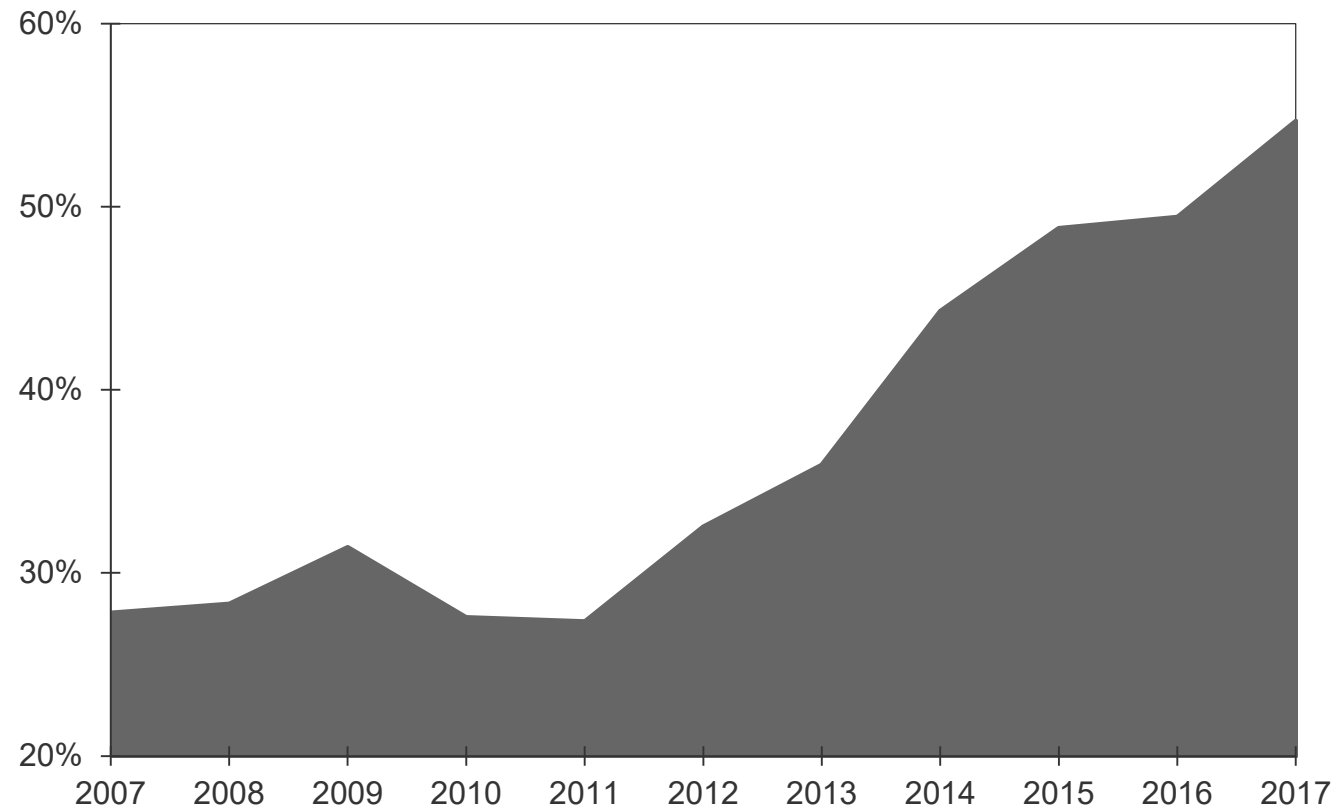
REGULATION?

**2/3**

TECHNOLOGY?

**1/3**

Shadow Bank share in the US residential mortgage market

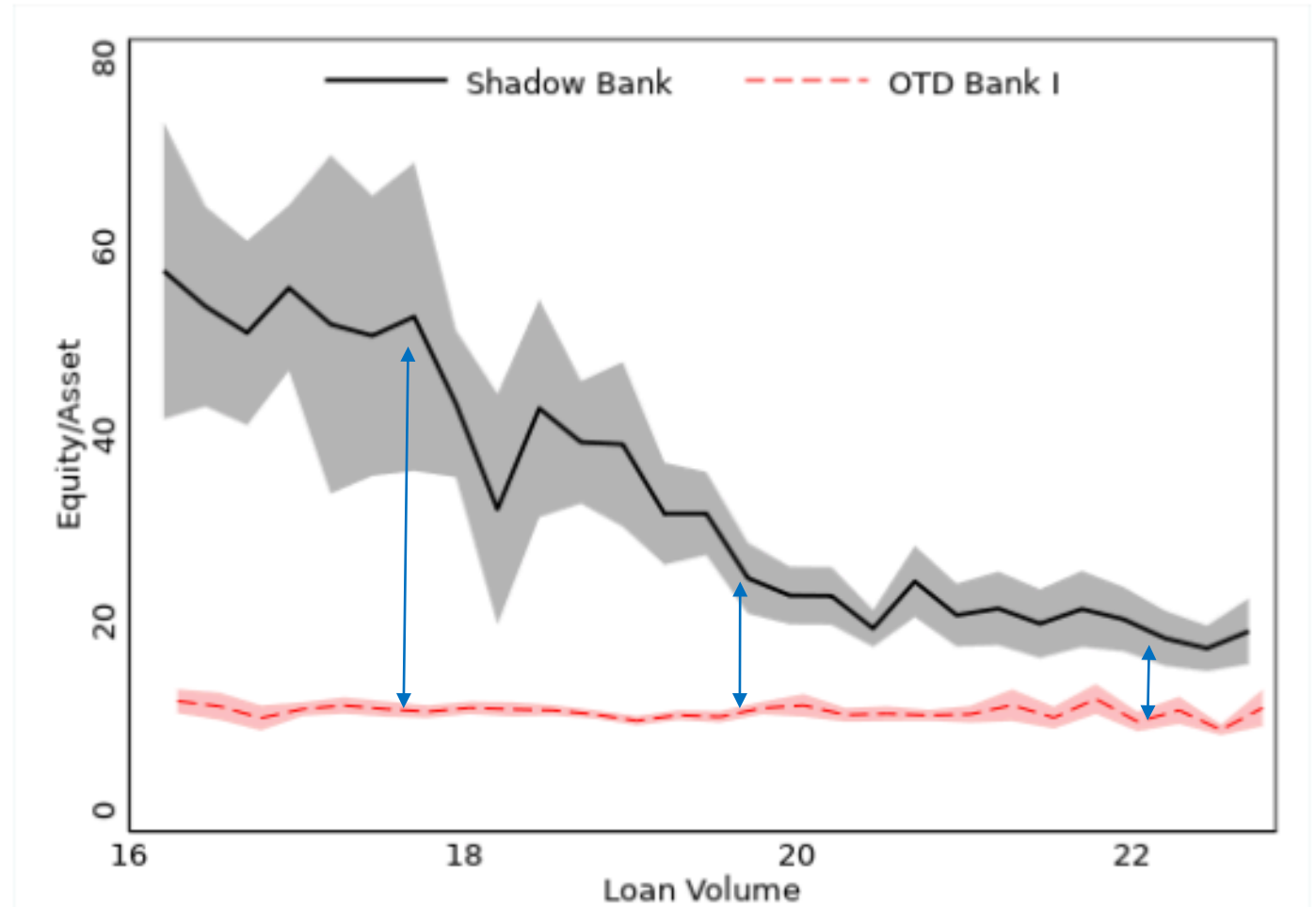


Source: Buchak et al. (2018)



# Regulation?

- ☐ Deposits are cheap

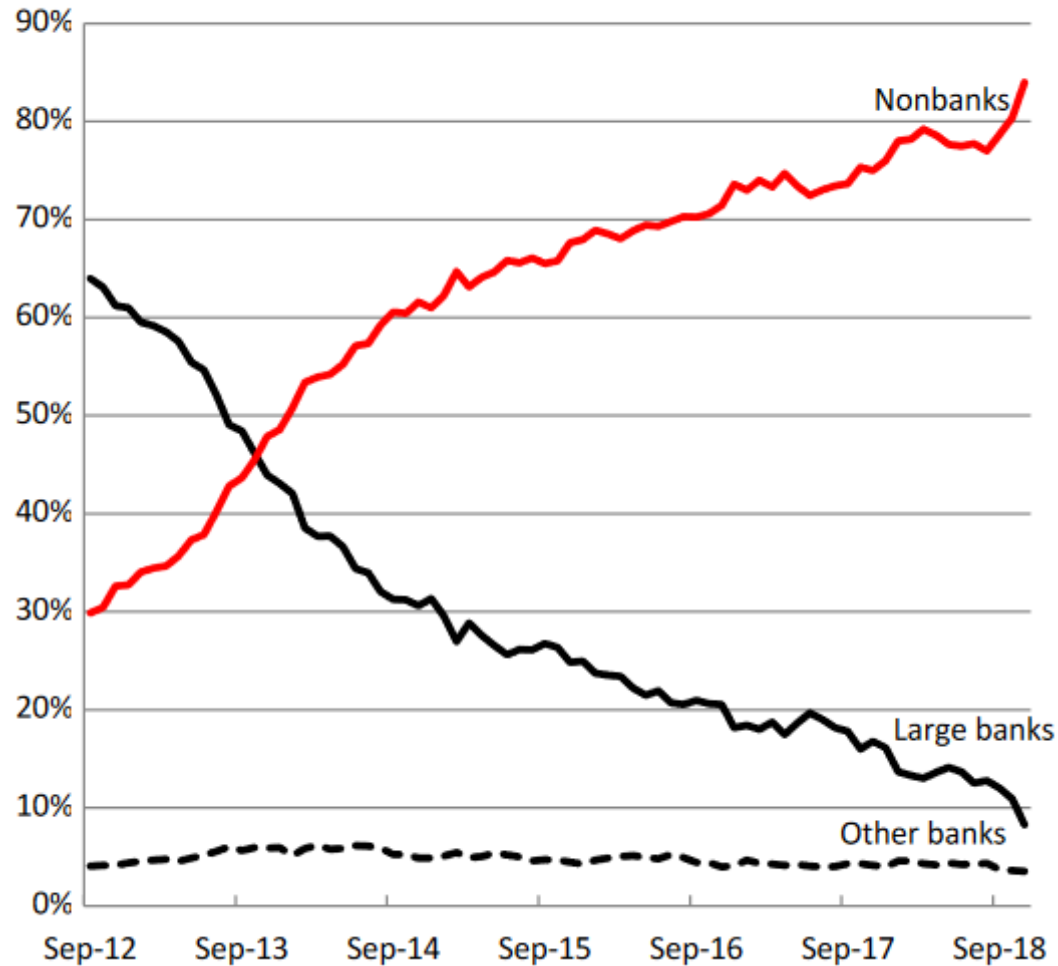


CHALLENGES?

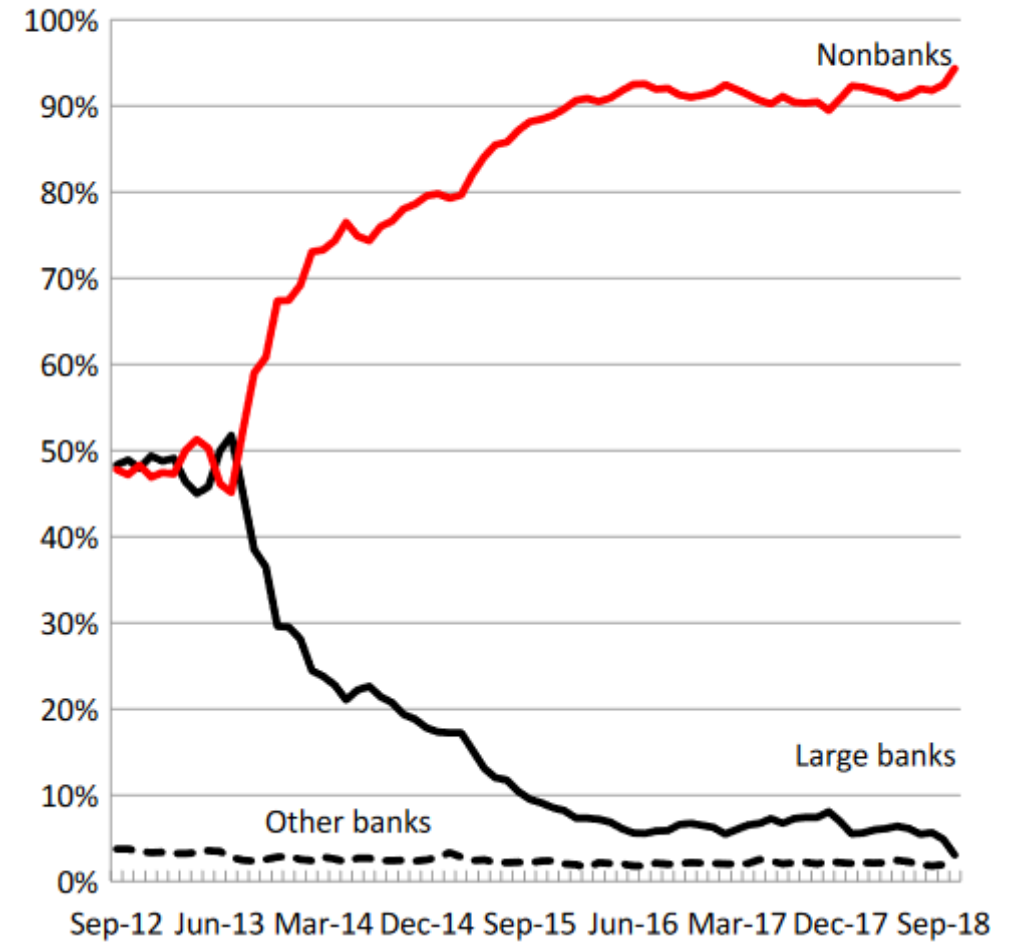
STABILITY BASED REGULATION

# Migration of Risk

### Share of FHA Insured Purchase Mortgages by Lender Type



### Share of FHA-Insured Refi Mortgage Originations



# Stability oriented Regulation

- “Shadow bank migration” margin
  - Lower regulatory burden
- “Traditional bank retention” margin
  - Banks shifting business model with capitalization
- Integrated intermediation: Lending, stability, redistribution
  - Business models
  - Industrial organization
  - Equilibrium

CHALLENGES?

INSIGHTS FROM DATA

# Big Data ≠ Correct Insights

## □ Big Data and Analytics ≠ Correct insights

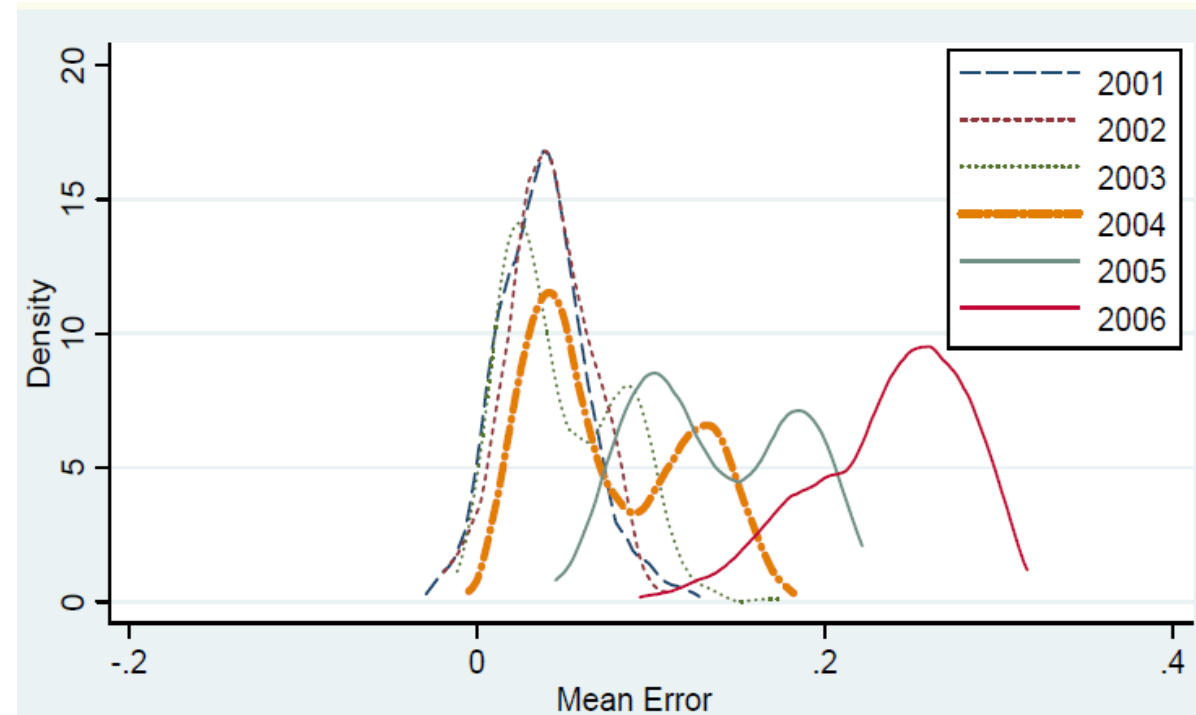
- Relationships of agents that produce data changes with changes in technology, incentives etc.
- Meaning of “hard information” changes → Models from “data scientists” will underperform

### PREDICTING DEFAULT OF LOANS

*Default Model*

$$\text{Prob}(\text{Default}_i = 1) = \Phi(\beta \cdot X_i + \beta^{\text{Low}} \cdot I_i^{\text{Low}} X_i)$$

### ...BUT FAILING TO PREDICT DEFAULT?



# Big Data ≠ Correct Insights

- ❑ Zillow recently shut iBuyer business
  - Took \$400m+ write-down on home inventory
- ❑ Main issues?
  - **Difficulty in pricing:** CEO: “determined the unpredictability in forecasting home prices far exceeds what we anticipated”
    -
  - **Adverse selection:** “most proposals Zillow Offers made to homeowners were not taken. Only 10% of offers made were taken”
- ❑ Risk taking when profits suffer → over reliance on “models”



CHALLENGES?

HARMONIZATION OF REGULATION



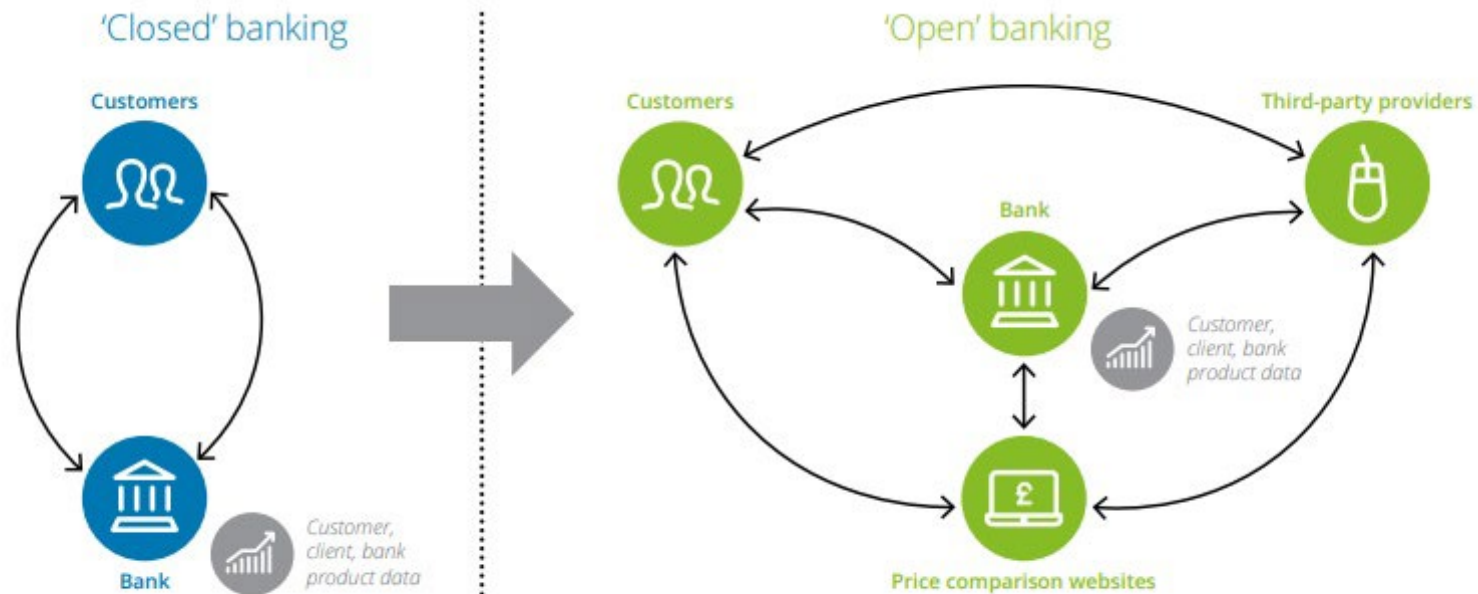
# Harmonization

## ❑ Same Activity...Same Regulation

- What comparative advantage will remain? And which activities will be impacted?

## ❑ Data sharing...symmetric?

- Monetization? Privacy (Discrimination/Biases)?



# Open Questions

## ❑ Why did banks not innovate already?

- Rents?
- Regulation?

## ❑ How do we balance regulation with incentives for innovation?

- Sandbox/Collaborations?
- Regulatory turf war and coordination?

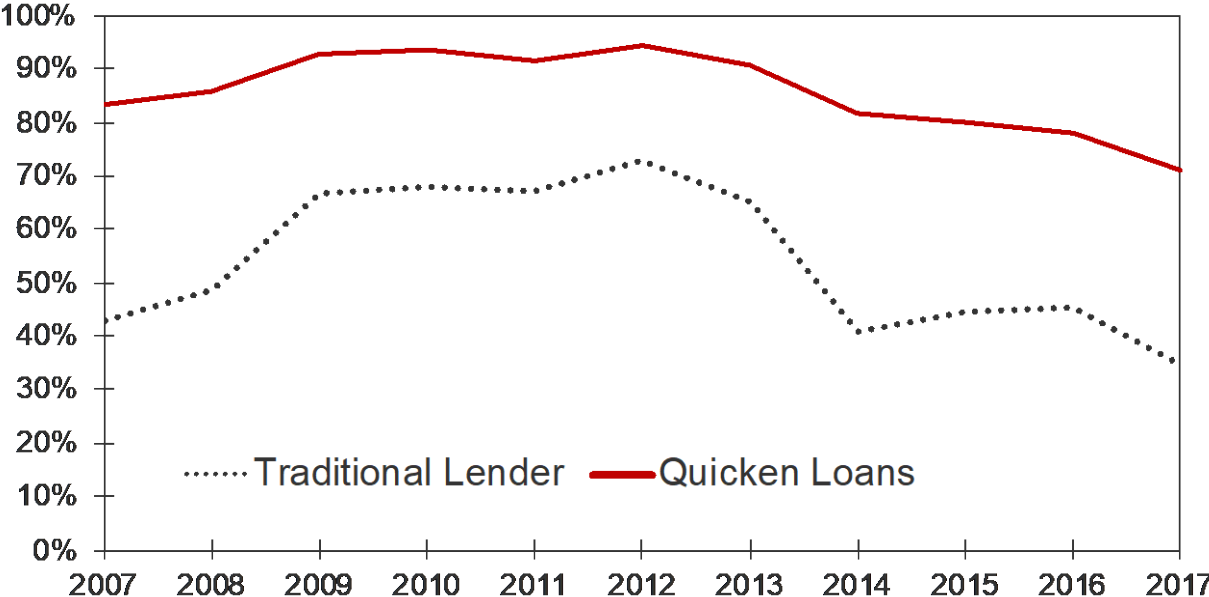
## ❑ Are there limits of technology?

- Insights from Data?
- Consumers with high WTP (more liquid/ easy to price homes, more creditworthy borrowers)?

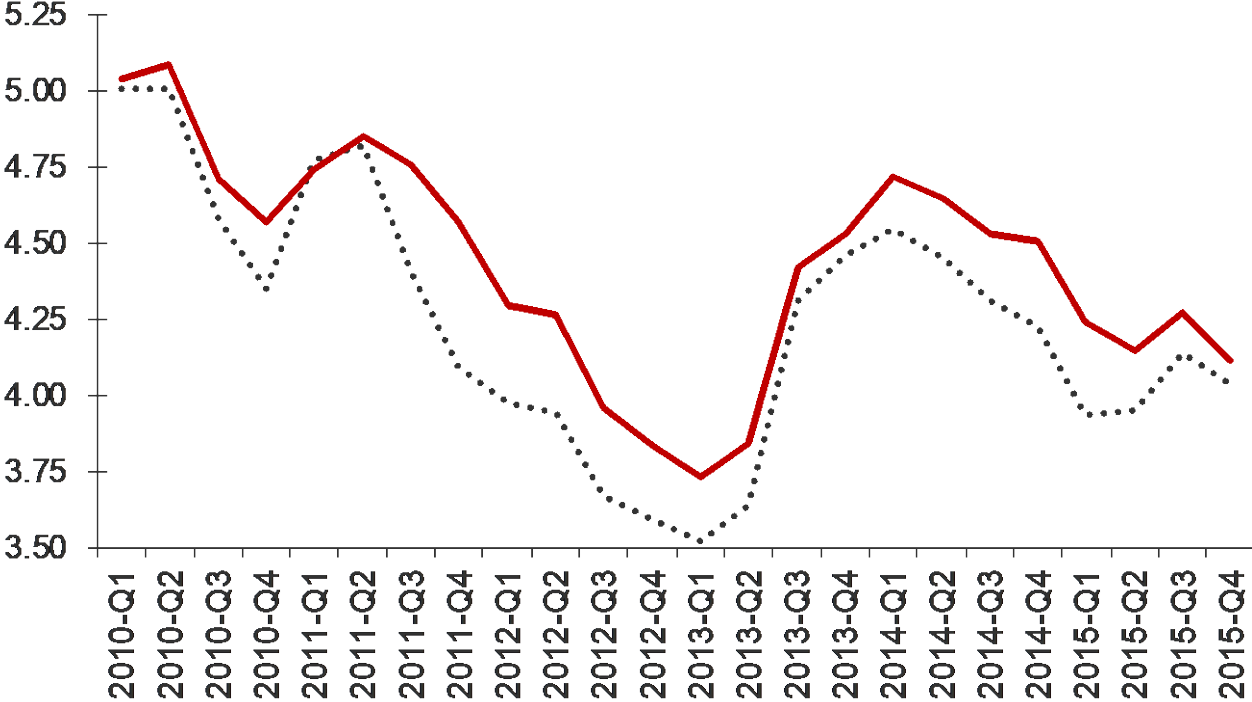
END

# Technology

## REFINANCING PERCENT



## WILLINGNESS TO PAY



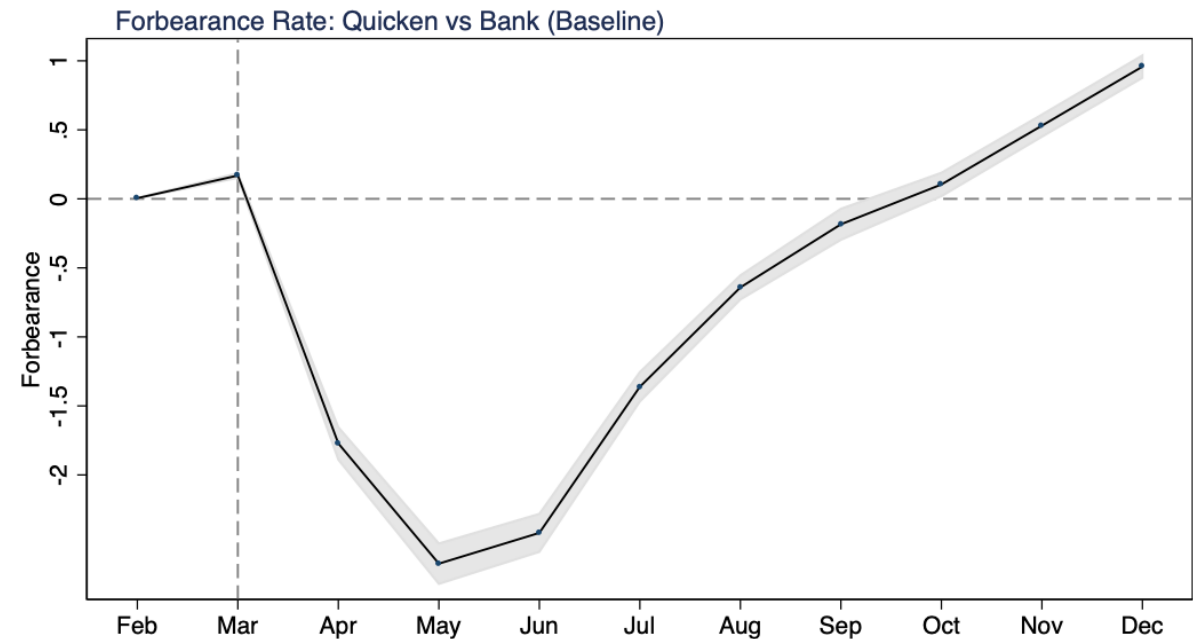
Source: Buchak et al. (2019)

# Pass-through of Stabilization Policies?

## Other Policies?

### □ Fintech

- Decreasing importance of local banking/brick and mortar/relationships
- Markets and borrowers whose risk is “easier” to price/WTP “easier” to assess
  - Refinancing
  - Cookie-cutter
  - Speed/ Convenience
- Stabilization?
  - Monetary policy (refi)
  - Reliant on “securitization” markets
  - Reliant on thin balance sheets



# Mechanisms?

## □ Regulation? and/or Technology?

- Regulation: capital costs, scrutiny/supervision burden, legal costs
- Technology: lower costs, better/higher quality products, better models

## □ Extensive regulation of banks after crisis

- Regulation dampens bank lending
- Shadow banks fill regulatory gaps

## □ Fintech lenders and technological advantage

- Target segments (refi) with comparative advantage (“data”); offer better quality
- Charge for convenience

## □ Key Patterns

- Bank vs Shadow bank: Banks losing mkt share due to higher regulatory costs or interest rates?
- Fintech vs Non Fintech: Fintech gain mkt share despite higher interest rates?