

# Bypassing banks using tech

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# How does tech affect you?

My name is Raghavendra

New voicemail from (415) 306-8424 at 19:30



Inbox x

 Google Voice

Hello, this is Robert Green. I'm calling you from. National Market research firm we are conducting a brief survey on behalf of comcast of our customers. We would like to speak with. the Avenger

PLAY MESSAGE



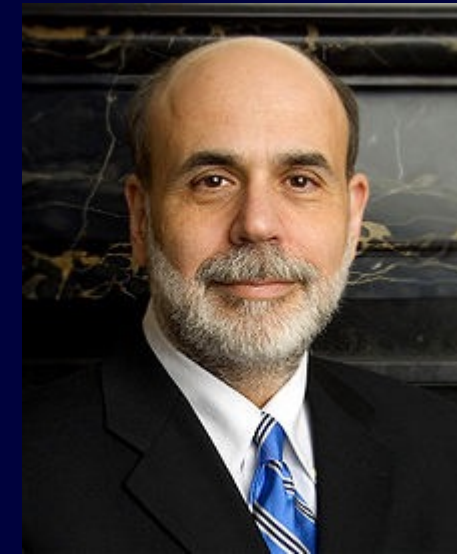
# So I shortened it to Raghu



Ragù alla bolognese



Ragôut



Ben Bernanke



Pep Guardiola



# What are we going to talk about?

Financial intermediaries have to deal with three information problems:

- Imperfect information
- Asymmetric information
- Behavioral biases

Technology is changing the process of dealing with these problems

Three developments: Cryptography, Big data (sensors/smartphones), AI



# Solving information problems in finance

Telegraph: 1838 patent by Samuel Morse

- Prior technology: homing pigeons, the Pony Express, visual telegraphs (semaphore system) and railroads
- What did the telegraph do?
  - It replaced an existing technology
  - Dramatically reduced costs
  - Initial oligopoly, later monopolized by a single firm
  - Ultimately was displaced by a newer technology.



# What effect did the telegraph have?

## Centralization of prices

- In 1846, wheat and corn prices in Buffalo lagged four days behind those in New York City.
- In 1848, the two markets were linked telegraphically, and prices were set simultaneously.
- Over the 19th century, hundreds of exchanges appeared and then disappeared across the country.
- Only those in New York, Philadelphia, Boston, Chicago and San Francisco remained important.



# Why was centralization important?

Increased liquidity

Increased investment in the market

New types of institutions arose



# And eventually the telegraph disappeared

Table 2: Telegraph and Telephone Rates from New York City to Chicago: 1850-1970

Date	Telegraph*	Telephone**
1850	\$1.55	
1870	1.00	
1890	0.40	
1902		5.45
1919	0.60	4.65
1950	0.75	1.50
1960	1.45	1.45
1970	2.25	1.05
Today	\$9.95 for 250 words	

Source: Nonnemacher, T., History of the U.S. Telegraph Industry, Economic History Association (available at <https://eh.net/encyclopedia/history-of-the-u-s-telegraph-industry/>)

Notes: \* Beginning 1960, for 15 word message. Prior to 1960 for 10 word message. \*\* Rates for station-to station, daytime, 3-minute call





# Is improving the speed of communication enough?

Loans described in the Hammurabi code (1754 BCE):

- Property and commerce (debt, interest, and collateral): About 100 laws.
- Standards and limits for loan agreements to control usury: A lender could charge at most 20% for a silver-based loan and 33.3% for a grain loan.
- Certification: Lenders also had to finalize the contract in front of witnesses.
- Collateralized loans: Secured loans were common:
  - Property in the form of land and houses - or even wives and children - could serve as collateral.
  - Those in severe debt could enter indentured servitude to pay it off.

Source: McGrath, H, [What's so important about the Code of Hammurabi?](#)



# What does the finance world look like today?

- Enormous amounts of money are wired daily around the world
- Card payments are the standard form of payment in most of the developed world
- Credit is granted with credit score models.
- Is any of this new?



# Finance and technology: The takeaway

- In the past, technology reduced the cost of collecting and processing information.
- But it did not substantially change the business of making payments and loans nor did it eliminate the essential frictions involved, from adverse selection to moral hazard.
  - A loan at the time of Hammurabi faced roughly the same moral hazard and adverse selection risk of a loan at the time of Bill Clinton.
- And the technological innovation favored incumbent institutions, who had the scale and resources to apply them first.



# Finance and technology: New developments

- Major developments:
  - Central bank issued digital currencies (GovCoins)
  - Decentralized finance (DeFi)
  - The rise of tech platform firms
  - Big data
  - AI algorithms to understand who you are and predict your behavior

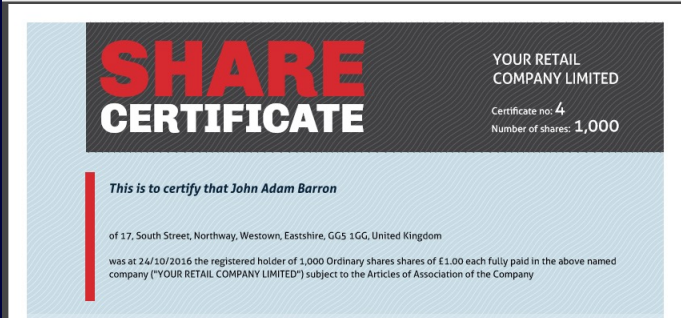
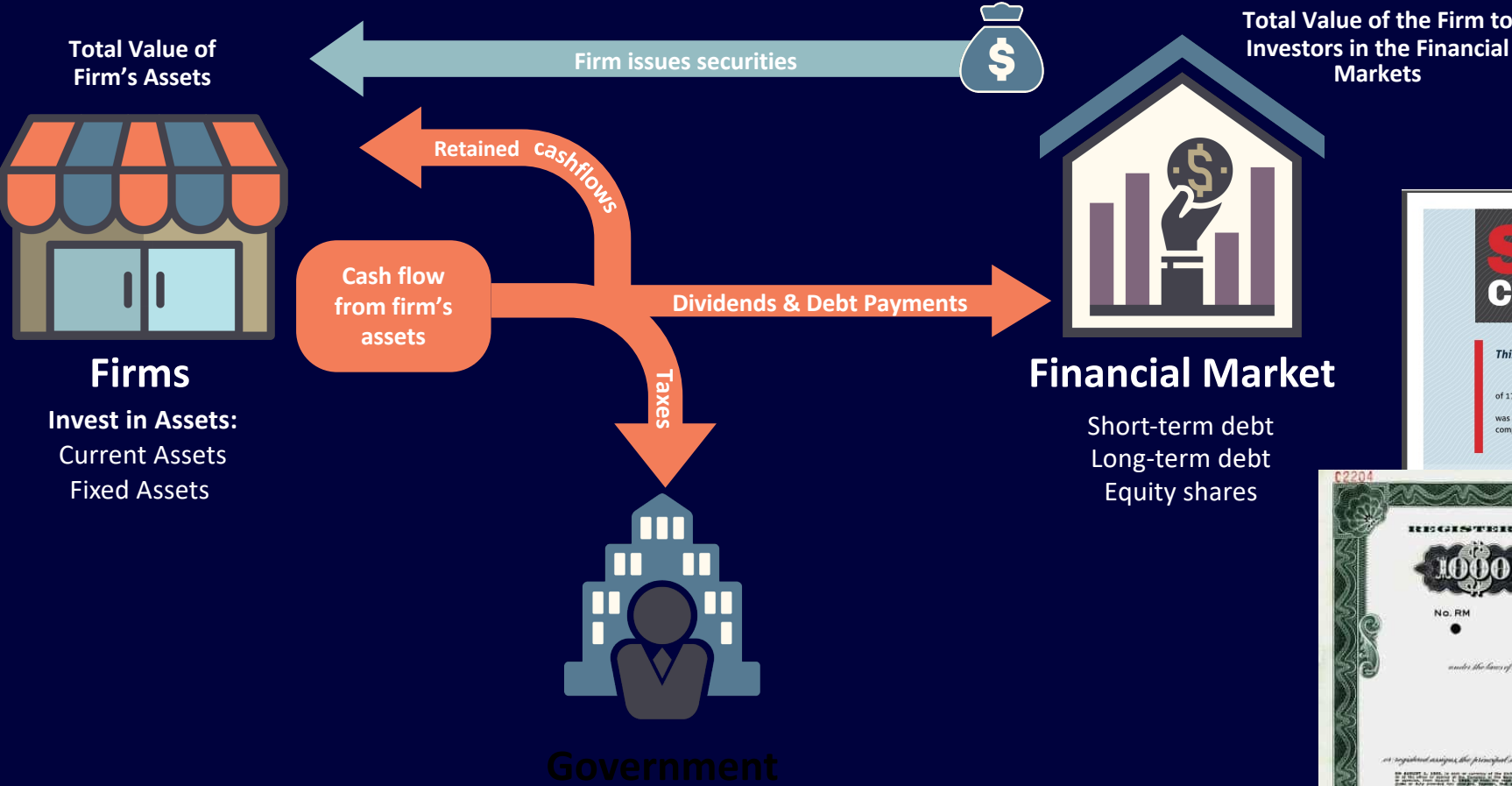


# What technological innovations caused this change?

- Three major innovations:
  - Cryptography
  - Sensor technology (beginning with the introduction of the first smartphone, the iPhone, in 2007)
  - AI
- Other technologies you need:
  - Hard disk space (The cloud)
  - Cheap computing power

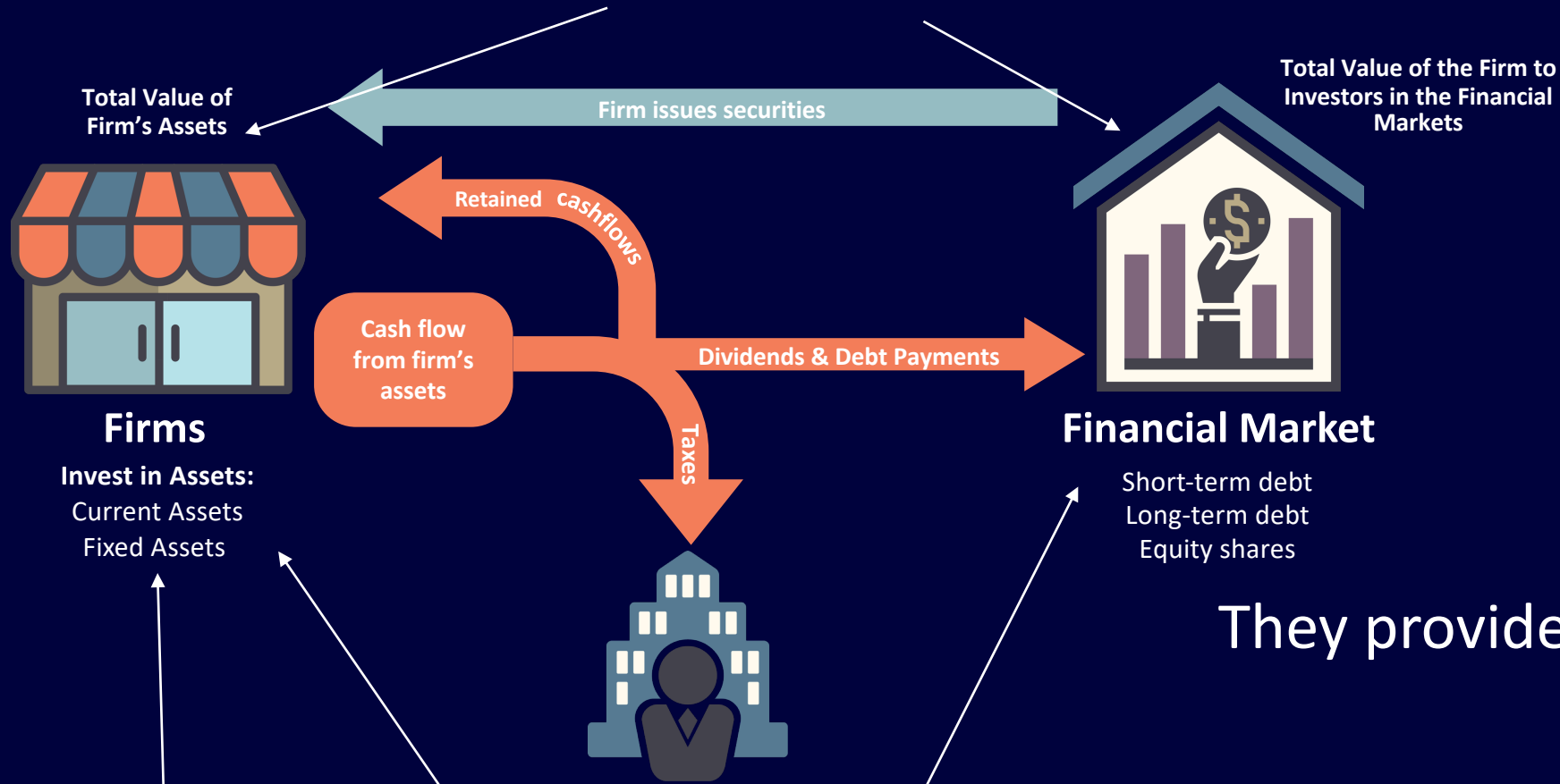


# Finance 101: The cycle of finance



# Where do banks fit in?

They match borrowers to lenders



They provide liquidity

They transform maturities

They take risks in assessing credit-worthiness

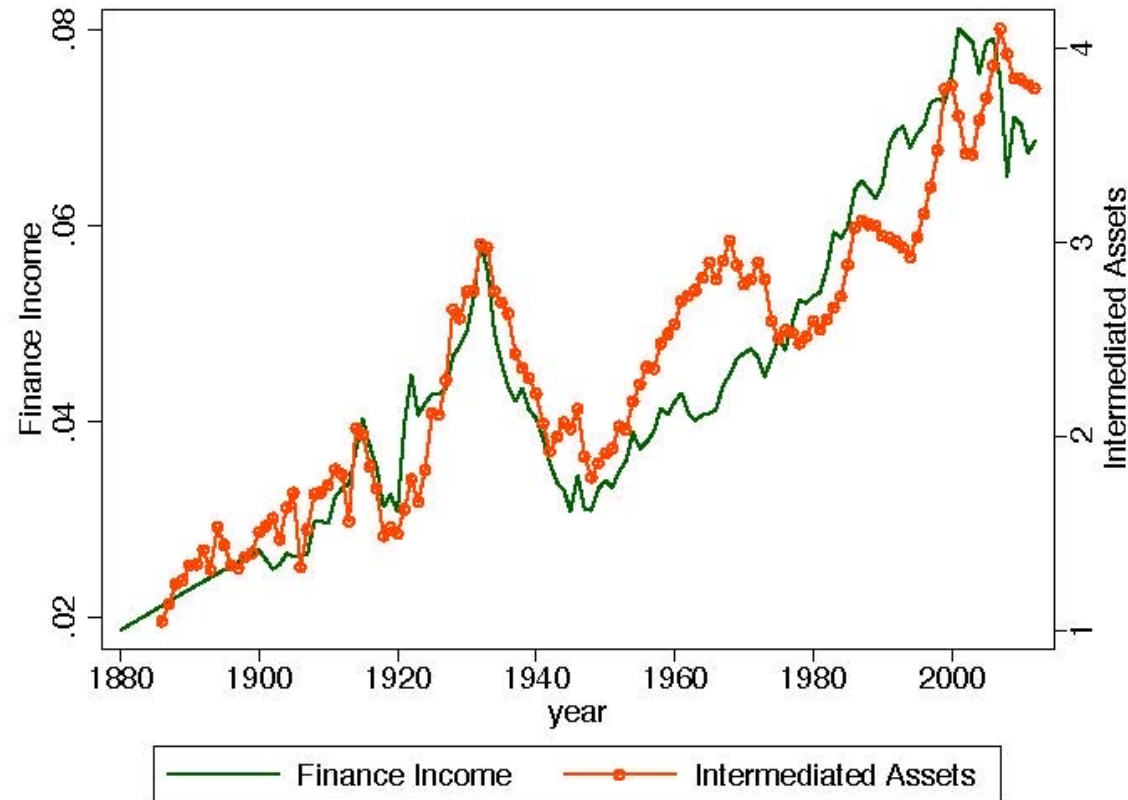


# Is this lucrative?

Net US revenues of financial intermediaries as % US GDP

YES!

Figure 2: Finance Income and Intermediated Assets over GDP



Philippon, Thomas, 2015, Has the US finance industry become less efficient? On the theory and measurement of financial intermediation, *American Economic Review* 105, 1408-38.





# Why do banks make so much money?

Typically three ways:

- They match lenders (suppliers of finance) to borrowers (who need finance).
- They facilitate the payment process.
- They charge fees:
  - For finding good investments (hedge funds, mutual funds)
  - For advising firms (corporate finance)



# Are banks doing a good job?

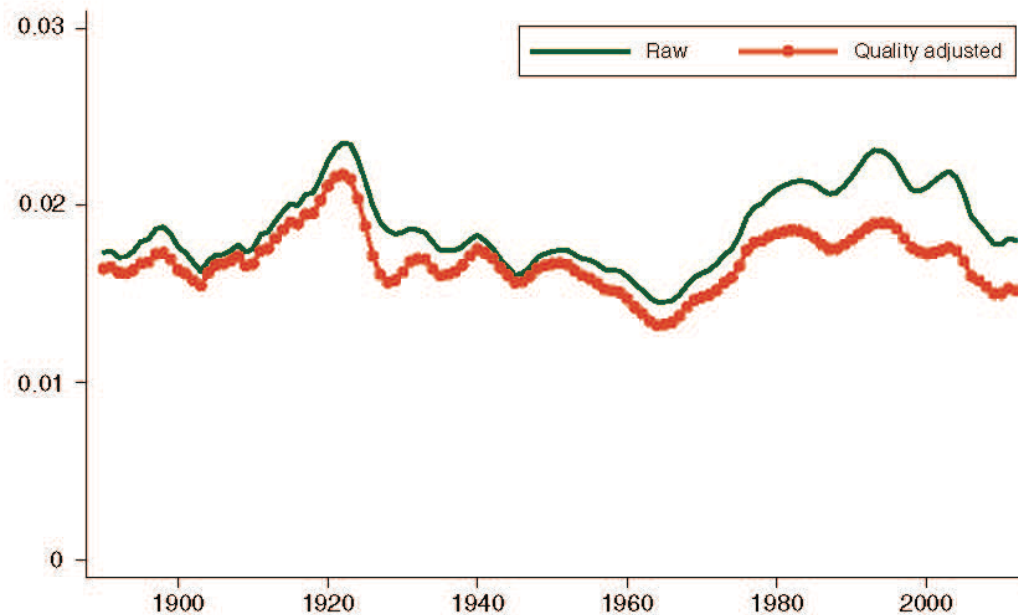


FIGURE 3. UNIT COST OF FINANCIAL INTERMEDIATION

*Notes:* The raw measure is the ratio of finance income to intermediated assets displayed in Figure 1. The quality adjusted measure takes into account changes in firms' and households' characteristics. Data range is 1886–2012.

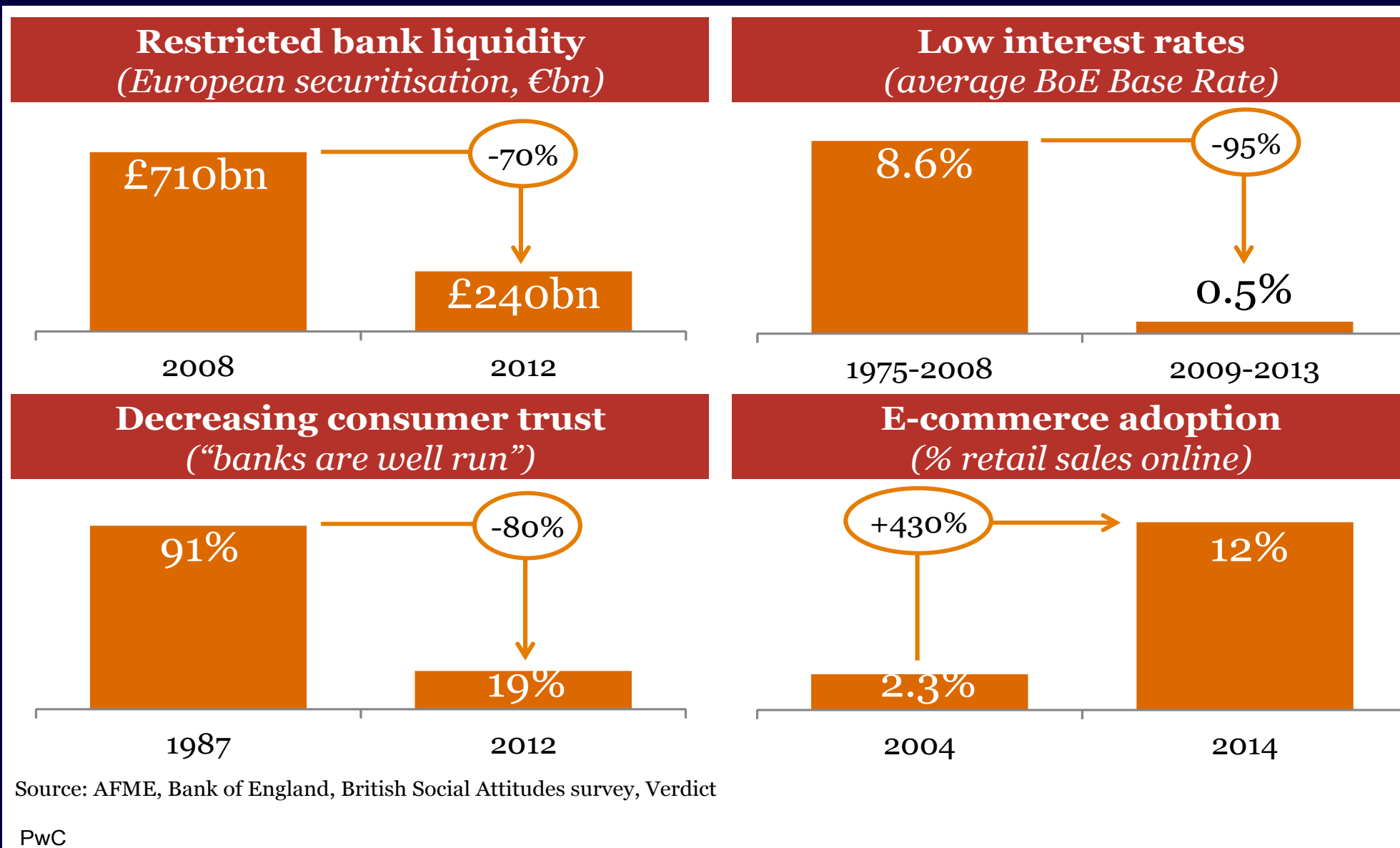
Profits from financial intermediation relatively constant for the last 130 years at just under 2%

No efficiency gains in banking since 1880

Philippon, Thomas, 2015, Has the US finance industry become less efficient? On the theory and measurement of financial intermediation, *American Economic Review* 105, 1408-38.



# Are they doing enough of their jobs?



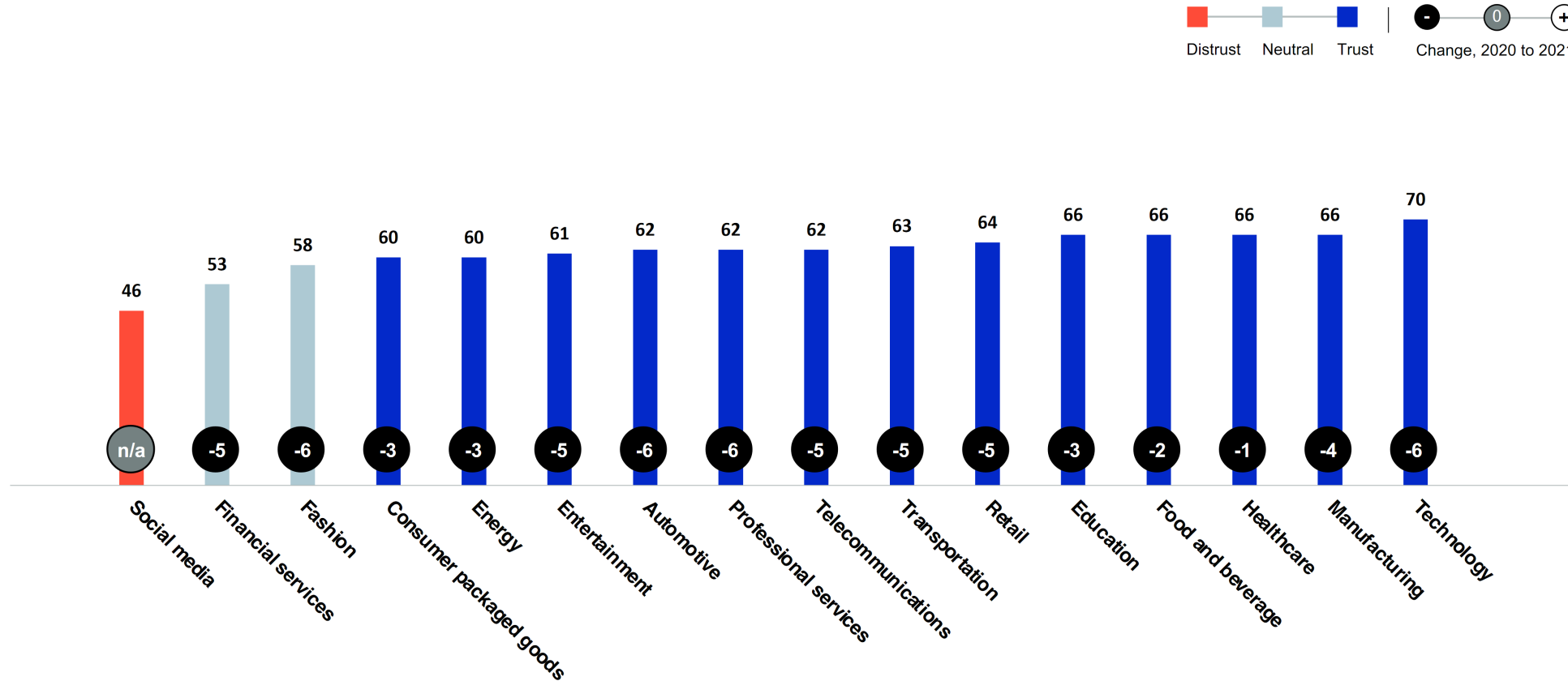
Source: AFME, Bank of England, British Social Attitudes survey, Verdict



# Banks are near the bottom of the trust tables

## TRUST DECLINES ACROSS SECTORS

Percent trust in each sector



2021 Edelman Trust Barometer. TRU\_IND. Please indicate how much you trust businesses in each of the following industries to do what is right. 9-point scale; top 4 box, trust. Industries shown to half of the sample. General population, 27-mkt avg.



### Trust in Industries 2021 (Edelman Trust Barometer)

# Do you really need a regulated financial intermediary today?

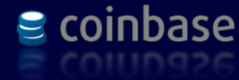
Loan?



Sending Cash Overseas?



Buy cryptocurrencies?



Buying a House?



Need a wealth manager?



Insurance?



Which banking alternative do you need?



Angel list



# The pain points for traditional banks

- Emerging competition
  - Tech companies
  - Telecom companies
  - Fintech startups
- Evolving customer expectations
- Regulatory burden
- Cost of legacy systems
  - What do you think is the most lucrative computer language to learn today?



# What is the biggest problem for banks?

Technology is making it easier to deal with information:

- Imperfect information
- Asymmetric information
- Behavioral biases



# What is asymmetric information?

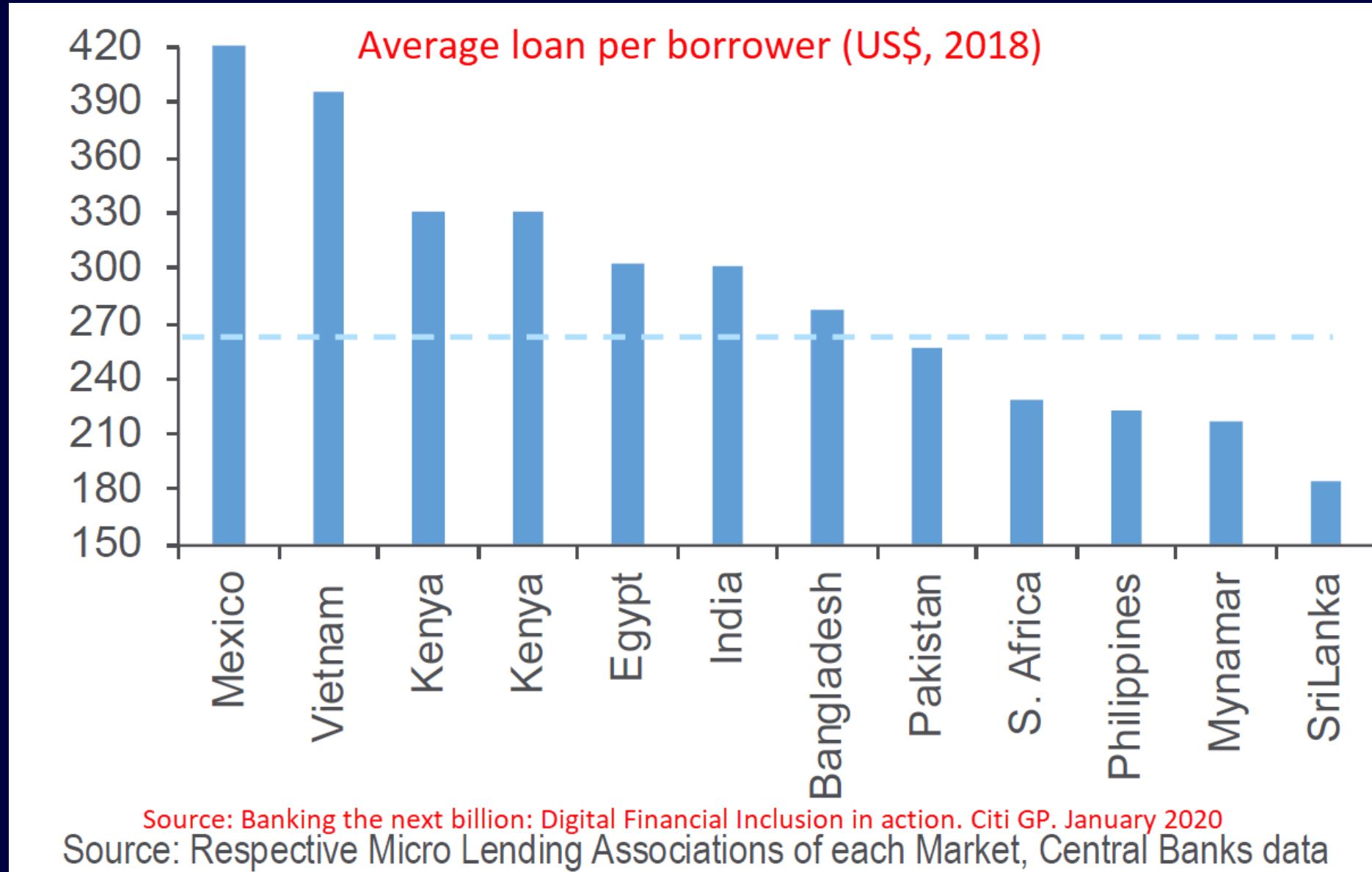
Two types of principal-agent problems

- Adverse selection
- Moral hazard



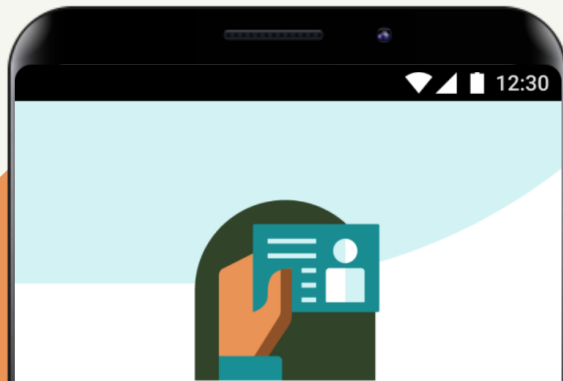


# Solving asymmetric information: Microfinance



# Solving asymmetric information: Tala

TALA



## Update your ID photo

Thank you for submitting your application. We need to make sure we have the most up to date version of your ID to create your new account.

## No long paperwork

Apply in minutes through the Tala app. Fill out a short application. Only one ID needed.



## Funds the instant you need

Once approved, funds are sent in seconds to your account or preferred cash out channel.



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Repay and build your relationship with Tala. Limits grow to meet your needs as rates decrease over time.



G

# Solving adverse selection: Root

How much does driving behavior impact your


## What if I'm a bad driver?

Root isn't the right fit for everyone. Our models don't work with every situation, so we may not offer you a quote after the test drive. That just means you could save more with another carrier, and we don't want to stand in the way of your saving money.

## Does the Root app need to be open for trip tracking to work?

The Root app does not need to be open. You actually give it permissions to run in the background on your phone when you set up the test drive.

 Driving behavior

 Other factors, including credit score, driving record, age, marital status, gender, ZIP code, vehicle type, and prior insurance

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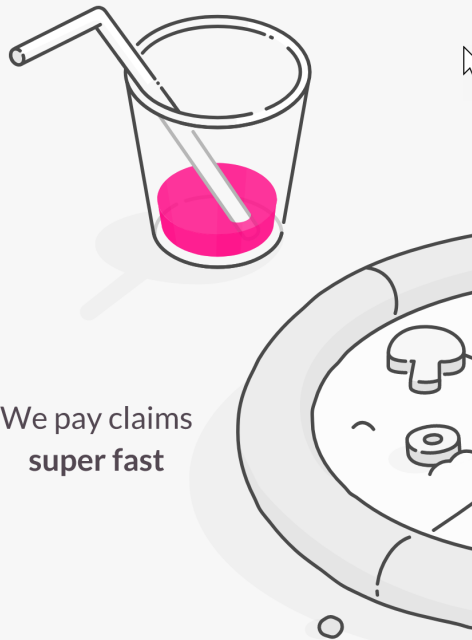
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# Solving moral hazard: Lemonade

## How I

Lemonade reverses the traditional insurance model. At Lemonade, everything becomes simple and transparent.



We pay claims super fast

\* Subject to board discretion and

We measure ourselves by the ❤️ we get from our members (4.9 ★★★★★) and the speed we pay claims (30% handled instantly).

We believe in good karma through balancing profit and purpose. So, we donate unused 💰 to causes our users choose. Last year, for example, we helped provide life-saving care and shelter to 29,578 rescued animals, planted 181,559 trees across critical ecosystems, helped grant online and in-person mental health services to 240,000 people, and sponsored a rare cancer research trial.



# Inverting moral hazard: Coventry First

A 79 year-old male owned a universal life policy with a face amount of \$1.5 million. Originally purchased for estate preservation, the policyowner could no longer afford premium payments on the policy. Rather than allowing the policy to lapse, his advisor suggested a policy valuation. Coventry First provided the policyowner with \$196,000 for a policy that otherwise had no cash surrender value, which he used for immediate retirement expenses and supplementary income.

Submit questionnaire and authorization to Coventry First along with carrier illustrations and medical records for the last five years.

Coventry First values the policy to determine if an offer can be made.

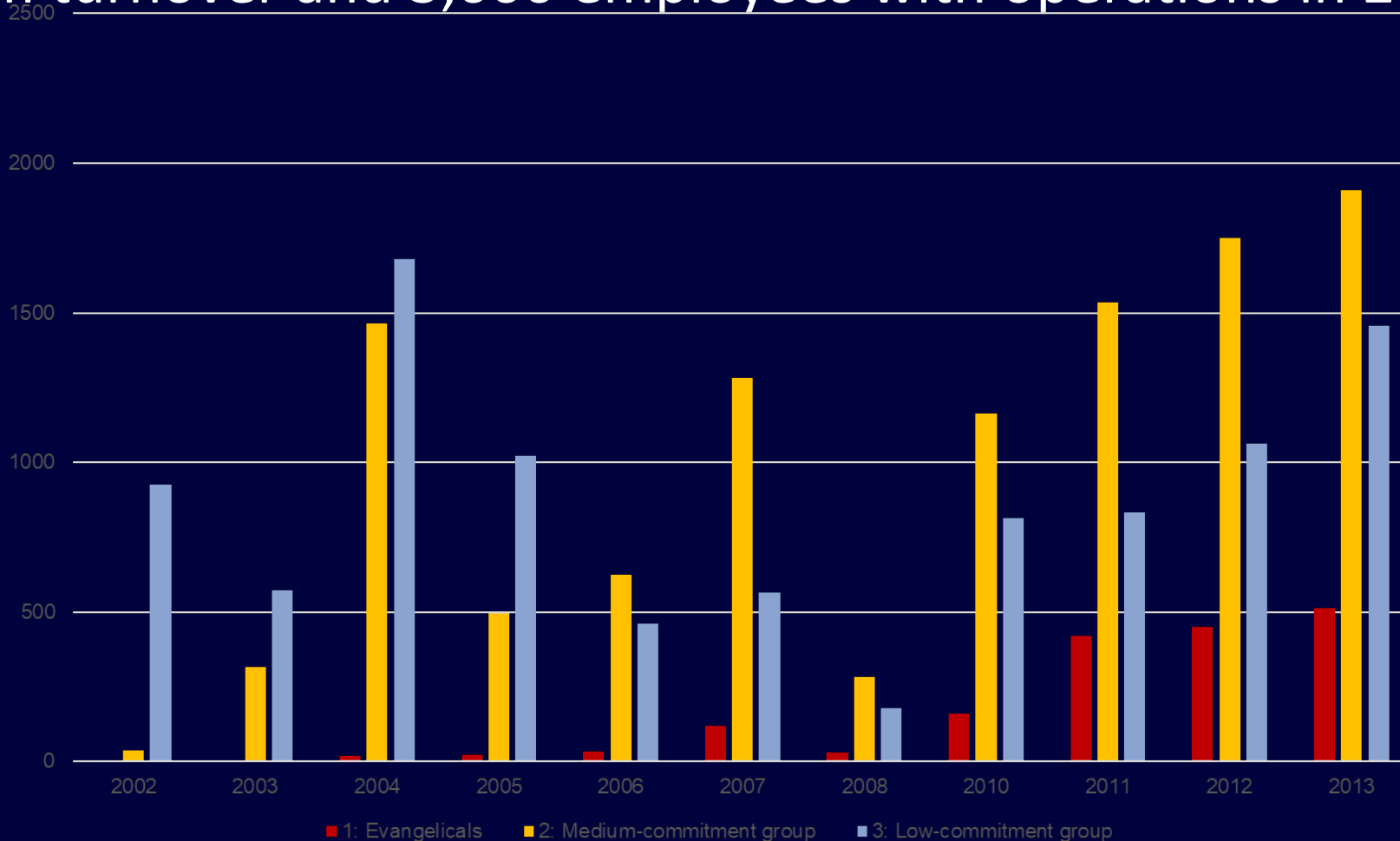
Once an offer is accepted, the change of ownership and beneficiary forms are sent to the life insurance company.

Upon confirmation that the change forms have been processed by the carrier, funds are released to the policyowner.



# Reducing adverse selection: Direct issue bonds

The issuer is an unlisted, unrated closely-held industrial chemicals producer located in a heavily-industrialized area of Germany with €600m turnover and 3,000 employees with operations in 20 countries

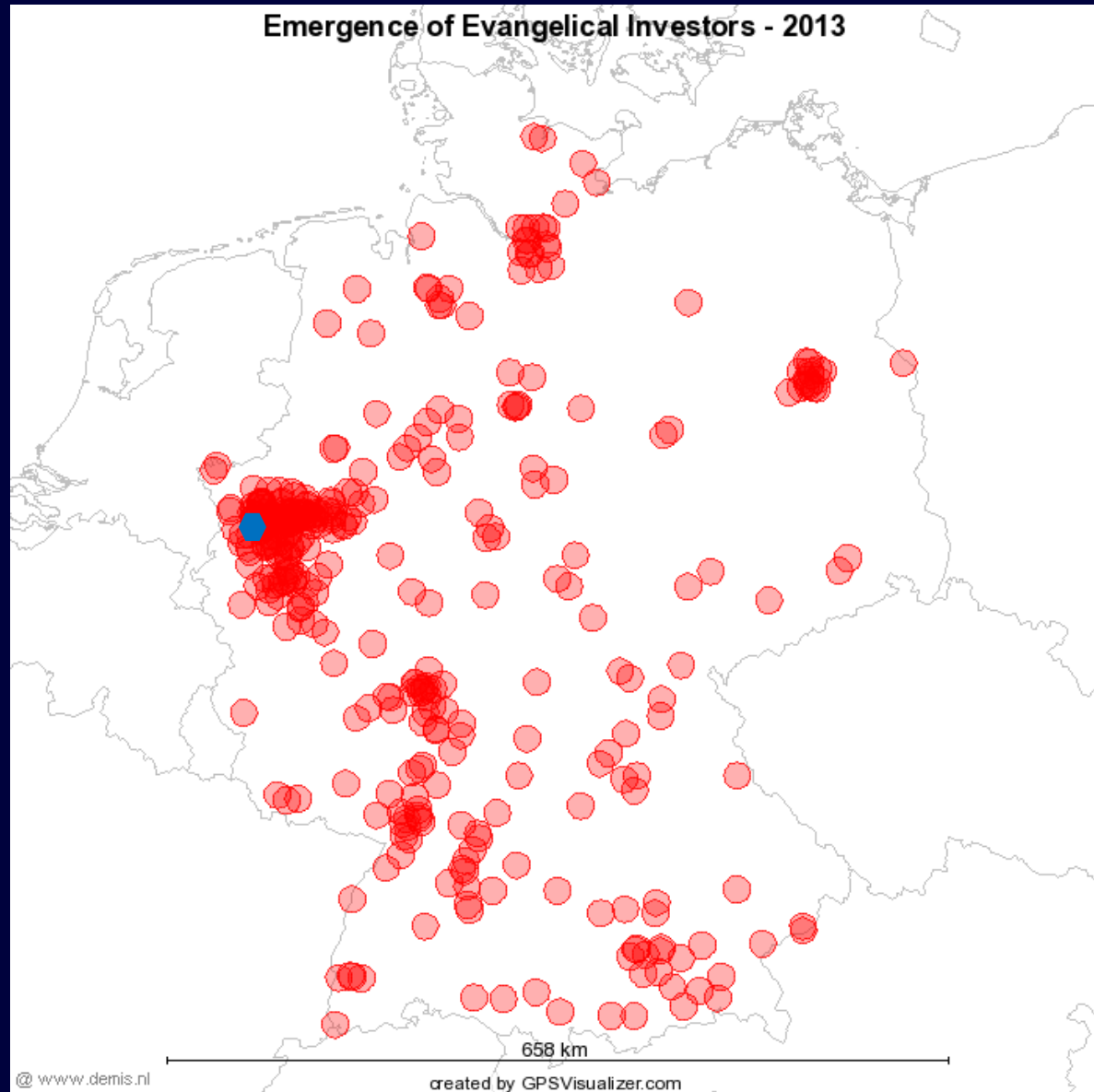


# The evolution of evangelicals

Symbols on the map:

◆ Issuer

● Evangelical Investors



# Reducing transaction costs: Wise



 [Personal](#) | [Business](#)

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FCA regulated  
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You send exactly  
**1,000**  **GBP** 

- **4.28 GBP** [Low cost transfer](#)  fee

= **995.72 GBP** Total amount we'll convert

x **1.14976**  [Guaranteed rate \(2 hrs\)](#)

Recipient gets  
**1,144.84**   **EUR** 

You could save vs banks  
**18.04 GBP**

Should arrive  
in **4 hours**

[Compare price](#)

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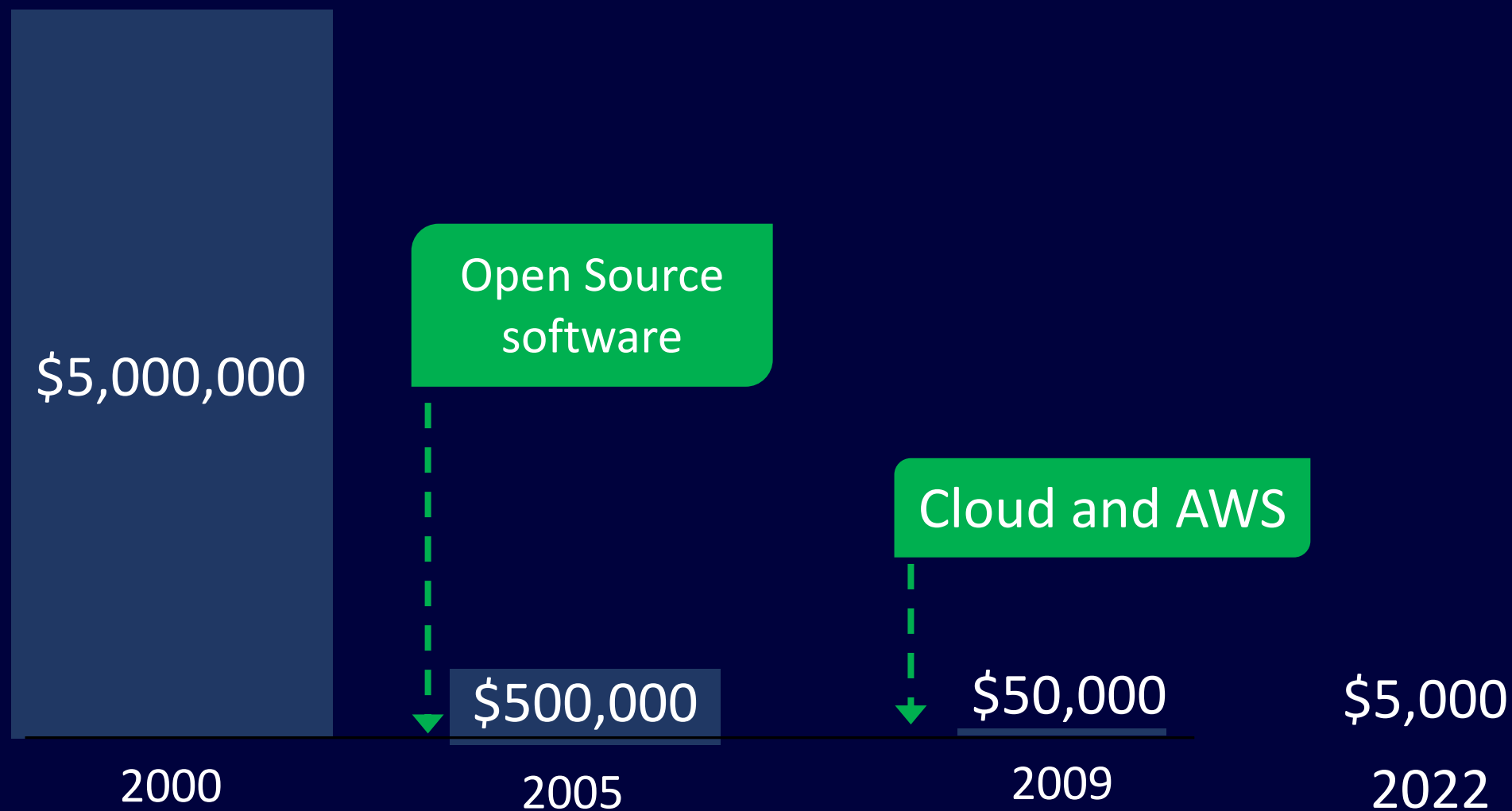
# But these are just the beginning

- Alternative methods of raising finance
  - Crowdfunding
  - Peer-to-peer lending
  - Direct issue bonds
- Alternative Wealth management systems
  - Advisory services (Robo-advisors)
  - Traded life insurance settlements (Death bonds)
- Alternative payment systems
  - Mobile payment systems (mPesa)
  - Foreign Exchange (Alternatives for remittances)
  - Payment Systems (Alternatives to Visa, SWIFT, and interbank transfers)
  - Bitcoin and distributed ledger systems



# Why are these technologies taking off now?

## Cost to Launch a Tech Startup



# The Cambridge Centre for Alternative Finance

- Established in January 2015 at the University of Cambridge Judge Business School
- Dedicated to the study of new financial instruments, channels and systems that emerge outside of the traditional banking and capital markets system
- Four core research themes:
  - Alternative instruments and channels
  - Alternative credit analytics using new forms of data
  - Alternative payment systems
  - How regulation is changing



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