High - Speed Internet, Financial Technology and Banking

Angelo D'Andrea and Nicola Limodio
Bocconi University

What we do

What frictions prevent an efficient capital allocation in financial markets?

We focus on frictions in the interbank market and show that:

1. new financial technologies reduce financial frictions
2. increasing interbank liquidity fosters credit supply

Research Questions

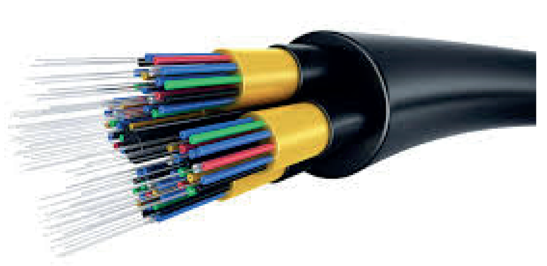
- Do financial technologies alleviate frictions in interbank markets?
- Do deeper interbank markets promote credit supply?

Theoretical mechanism

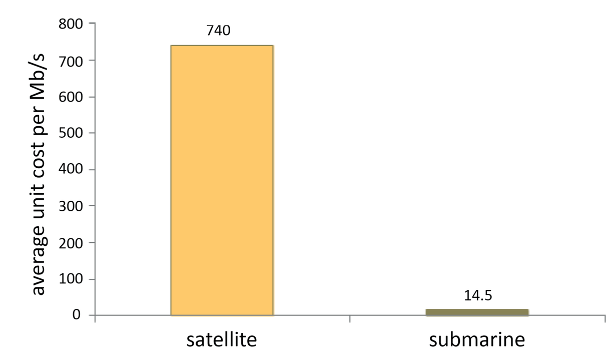
Mechanism à la Coase (1960):

- technologies lower transaction costs in interbank transactions
- more outside liquidity lead to less inside liquidity hoarding
- liquidity risk goes down and credit supply increases

Technology



Oceanic fiber-optic cables



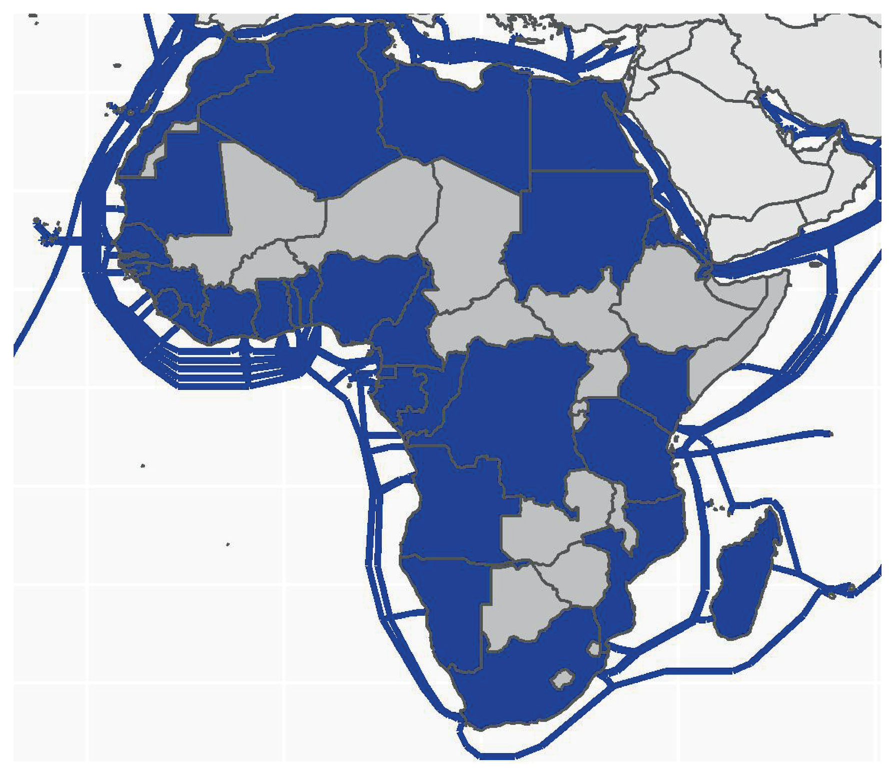
Reduction in communication costs

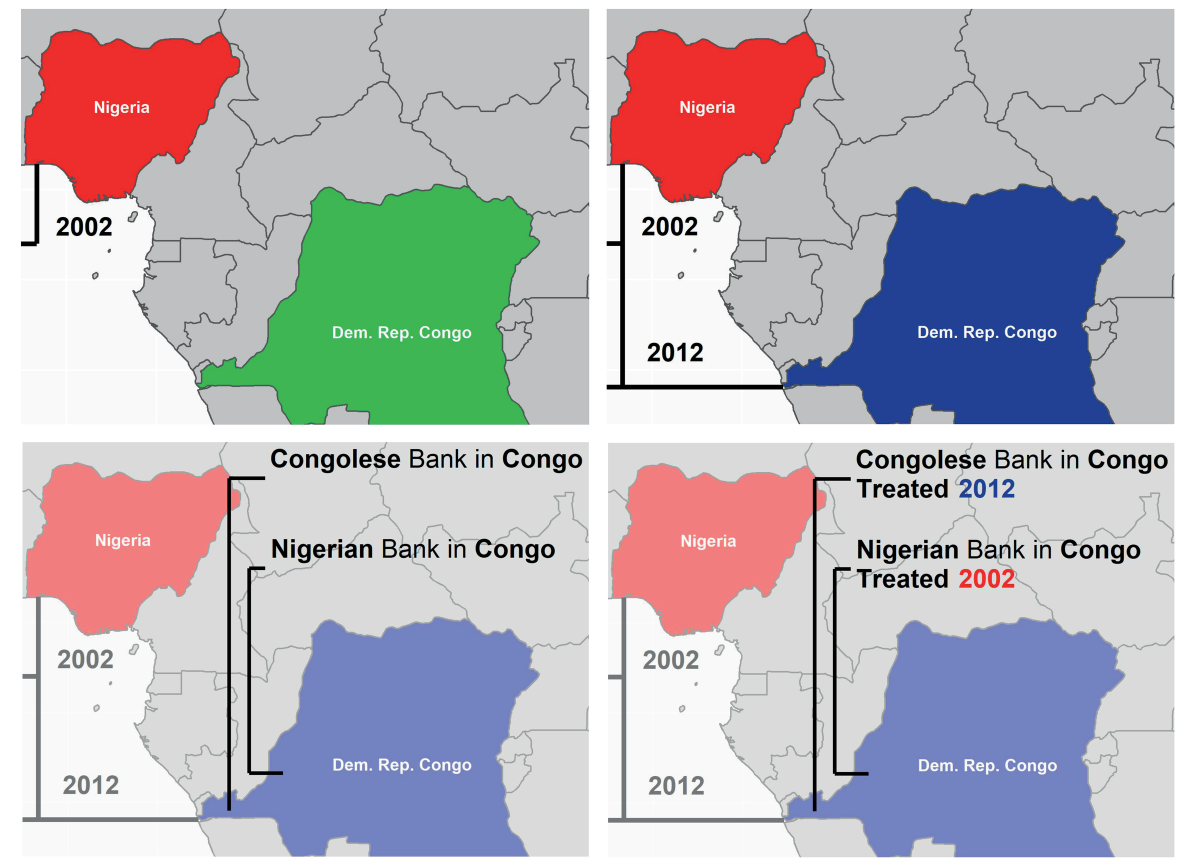
Data

- Bankscope (BvD): financial and finance reports for 489 banks in 37 coastal countries in Africa
- TeleGeography: maps of submarine fiber-optic cables
- Central Banks Official Reports: data on RTGS adoption
- Word Bank Enterprise Surveys: characteristics, business activity and funding for 28171 firms
- Word Bank Global Financial Development Database: dataset of financial system characteristics
- Word Bank Worldwide Governance Indicators: aggregate and individual governance indicators

Natural Experiment

- Major shock to African banks (before satellites)
- Cables to connect America, Europe and Asia
- To accomodate general telecommunication needs





Isolate the supply channel:

- exploit the staggered arrival of submarine cables
- banks connected through their group partners
- use Group-year and Country-year fixed effects

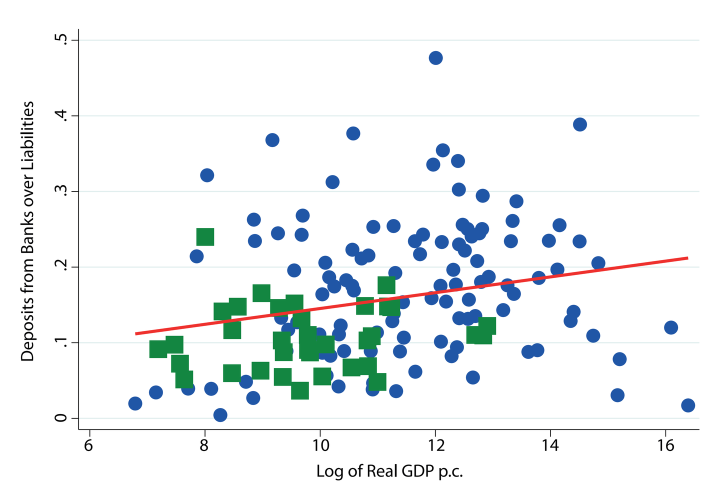
Methodologies

- Machine learning to predict (bank) RTGS adoption
  - $Y_{ict} = f(X_c^1, X_{ct}^2, X_{ict}^3)$
- Event study
  - $Y_{ict} = \alpha_i + \beta_t + \gamma_{-5} I\{K_{ct} \leq -5\} + \sum_{k=-4}^{4} \gamma_k I\{K_{ct} = k\} + \gamma_{5+} I\{K_{ct} \geq 5\} + \varepsilon_{ict}$
- Staggered difference-in-differences (DID)
  - $Y_{ic}t = \alpha_i + \beta_t + \gamma D_{ct} + \varepsilon_{ict}$
- Staggered DID with heterogeneity
- Group-year and Country-year fixed effects to isolate the supply channel
- Real effects on firms

Results

The African financial landscape:

- banks experience high liquidity risk
- limited functioning of local liquidity markets
- local interbank markets small or non-existent

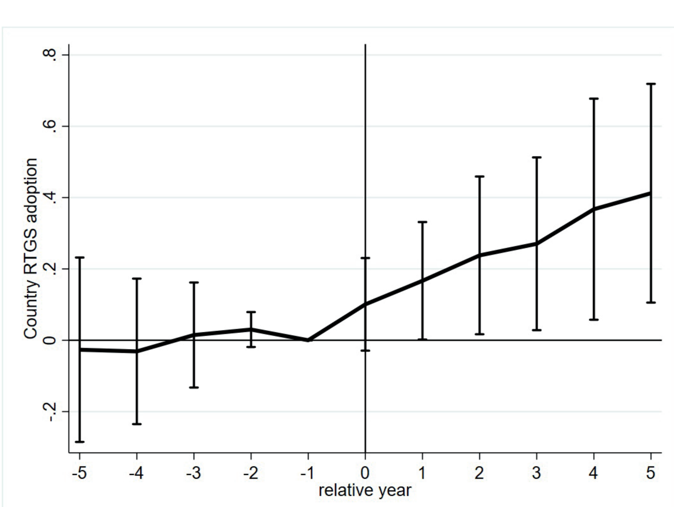


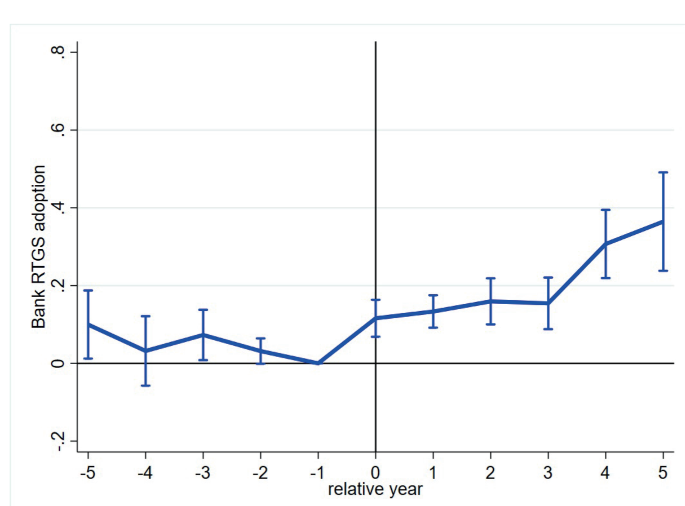
Correlation is 0.234***; Bankscope 2000-2010; African countries in Green square

Connection to high-speed internet

1. Increases the probability of adoption of RTGSs

- at the country level
- at the bank level



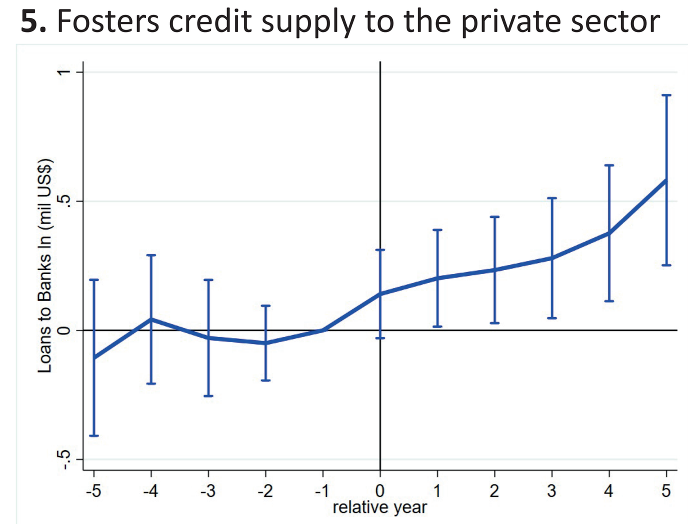


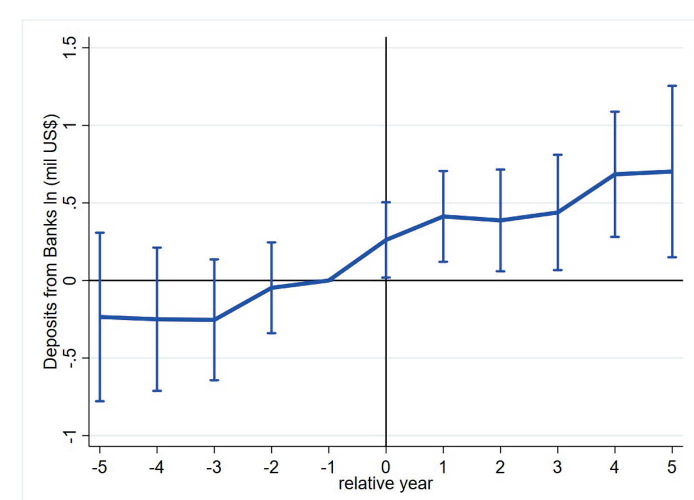
2. Increases the amount of transactions in the interbank market

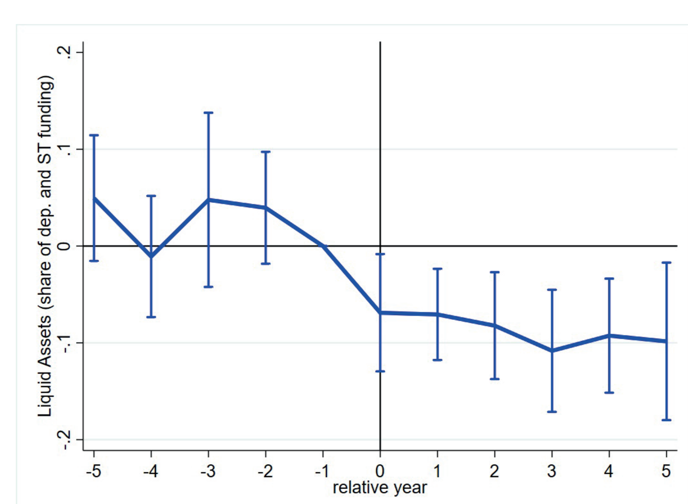
3. Reduces interbank maturities

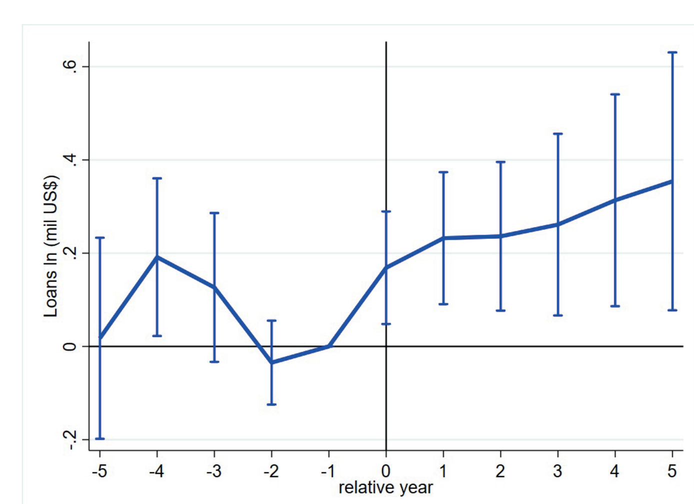
4. Reduces the hoarding of liquid assets

5. Fosters credit supply to the private sector









6. Benefits weak pre-users of the interbank market

7. Promotes firms' financial assets and long-term investments

Table 4: Staggered Diff-in-Diff - Weak Lender

Variables	(I) Liquid Assets (share DST)	(II) Loans to Banks ln(milUS$)	(III) Deposits from Banks ln(milUS$)	(IV) Private loans ln(milUS$)
$Submarine_{ct}$	-0.0501**	-0.0848	0.0527	-0.0478
	(0.0251)	(0.113)	(0.148)	(0.0955)
$Submarine \times Weak\ Lender_{ict}$	-0.0949***	0.441***	0.772***	0.382***
	(0.0338)	(0.162)	(0.221)	(0.121)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs.	3720	3514	2710	3715
Adj. R^2	0.475	0.830	0.717	0.892
M.D.V.	0.461	3.750	2.696	4.933

Table 9: Staggered Diff-in-Diff - Weak Interbank

Variables	(I) Access Finance (dummy)	(II) Bank Credit (dummy)	(III) Sales ln(USD)	(IV) Maturity ln(Months)
$Submarine_{ct}$	0.043	-0.001	-0.168	0.587**
	(0.061)	(0.047)	(1.245)	(0.214)
$Submarine \times Weak\ Intb_{ct}$	0.160**	0.097**	3.821***	0.418*
	(0.065)	(0.035)	(1.315)	(0.238)
Country FE	Yes	Yes	Yes	No
Year FE	Yes	Yes	Yes	Yes
Obs.	25389	25222	24064	1139
Adj. R^2	0.0965	0.127	0.334	0.127
M.D.V.	0.638	0.211	12.11	3.008

Takeaways:

- investments in financial infrastructures promote capital markets integration
- capital markets integration can be a driver of economic growth
- new financial technologies help in the catch-up of developing countries

CONTACTS
angelo.dandrea@unibocconi.it
Bocconi University, Department of Economics