THE DISCIPLINING EFFECT OF BANK SUPERVISION: EVIDENCE FROM SUPTECH

BY HANS DEGRYSE, CÉDRIC HUYLEBROEK, BERNARDUS VAN DOORNIK

Discussion by Andrea Polo (Luiss, EIEF, CEPR & ECGI)

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SupTech

- The term is defined by the BIS (Broeders and Prenio, 2018) as the use of innovative technology by supervisory agencies to support supervision
- Since then, suptech initiatives have gained momentum around the world.
  - A BIS survey of 39 financial authorities show that half of them have explicit SupTech strategies or are developing them (Di Castri et al., 2019). Different stages of implementation and technology
- Objective is to adopt big data and AI processes and systems to support the work of financial authorities

Two areas of applications

- Data collection:
  - Examples: pulling data directly from banks' IT systems, automated data validation and consolidation
- Data analytics:
  - Examples: detecting insider trading activities, money laundering identification, monitoring supervised entities' liquidity risks and forecasting housing market conditions

Expected benefits and challenges

- Expected benefits:
  - enhanced effectiveness, reduced costs and increased capability
- Challenges:
  - computational capacity constraints, increased operational risks, including cyber-risk, data quality, finding the right talent, lack of transparency
- Hence, human intervention still viewed as indispensable, particularly in further investigating the results of analyses and deciding on a course of action (BIS, 2019)

This paper

- *"little is known about how the use of SupTech could affect the banking sector"* from Abstract

- What are the effects of SupTech events on bank behaviour?

- Diff-in-Diff around supervisory actions arising from SupTech application in Brazil during

Data

- SupTech data: Dataset of the BCB about ”early warnings” and supervisory actions arising from the central bank’s SupTech application
- Bank financial statement data: Monthly Balance sheet data for individual institutions
- Credit register data: Quarterly loan level data
- Firm data: Quarterly data on firm employment and profitability from the Brazilian Ministry of Labor and Employment

Supervisory actions arising from SupTech application

- SupTech application analyzes financial statements and generates automatic alerts for variations in various financial indicators or ratios

- Examples:
  - a bank reports a much larger credit growth than other comparable banks
  - a bank’s capital buffer has been declining for several months
  - inconsistencies in banks’ financial reporting

Supervisory actions arising from SupTech application

- These automatic alerts are reviewed by supervisors who may decide to:
  - Do nothing (false positive)
  - Intervene:
    - Formal actions: on-site inspections
    - Informal actions: Email exchange

- The supervisory actions resulting from this process are the focus of our paper

Results

- Bank level: *Treated* banks reclassify loans as non-performing and increase provisions, particularly for risky loans

- Bank-Firm level: *Treated* banks reduce risk-taking by lending less to riskier borrowers

- Firm level: Riskier firms borrowing from *treated* banks see a reduction in total credit and this has some (small but significant) real effects (revenues and productivity)

Is the paper about SupTech or about supervisory actions?

- My reading of the results: supervisory action is followed by reduction in bank risk-taking
- The fact that the first alert from the analysis of financial staments is given by a machine instead of a human being is not playing a major role
- Several papers show consistent evidence (Agarwal et al., 2014; Kandrac & Schlusche, 2021; Bonfim et al., 2022; Passalacqua et al.,2022; Kok et al., 2023; Abbassi et al. 2023,…). Quest for quasi-natural experiments
- Heterogeneity Test: Split according to the supervisory action (on-site inspections vs. email exchange)

Contribution to understand the impact of the innovative technology

- Key questions would be:
  - Does SupTech increase the probability of detecting financial distress or misconduct ?
  - Does SupTech help to detect financial distress or misconduct at an earlier stage?
  - ….
- Percentage of false positive and false negative
- Before and after introduction of SupTech
- Effects of supervisory actions initiated by SupTech vs ones initiated by human beings
- Anything along these lines would make the contribution of the paper with specific angle of SupTech more clear

Economic effects

- Riskier borrowers experience a 5% reduction in credit supply from *treated* banks
- In the other two studies on the effects of on-site inspections on bank risk-taking (Bonfim et al. 2022 and Passalcqua et al. 2022) the effect is 20%-60%
- You mention that this confirms *the very different* nature of on-site inspections analyzed in other studies which are much more intrusive than the ones analyzed here
- The 5% is for the all sample. If we consider only on-site inspections are results comparable?

Parallel trend assumption

- Since SupTech event is not random authors stress evidence in favour of parallel trend assumption in the dependent variable. However the alert comes from observing a *variation in a financial indicator or ratio*
- Examples:
  - a bank reports a much larger credit growth than other, comparable banks
  - a bank's capital buffer has been declining for several months
  - inconsistencies in banks' financial reporting
- Authors do also a PSM procedure but matching should be not only on level but on trend of key variables such as credit and bank capital to reinforce identification

My assesment

- Great data
- Careful analysis with already many robustness tests
- Overall convicing evidence

- My comments:
  - Contribution to the already significant literature on sup. actions or on the innovative technology
  - Small comments on comparison of economic effects with existing papers and on identification