Suptech tools for prudential supervision and their use during the pandemic[1]

Executive summary

Financial authorities use suptech tools for a range of activities, including data analytics for prudential supervision whose use cases have recently grown. An earlier Financial Stability Institute (FSI) publication found that most suptech tools were used for reporting and misconduct analysis, with relatively few deployed for prudential supervision (di Castri et al (2019)). The Financial Stability Board (FSB (2020)) found similar results, though it observed a rise in suptech use cases for prudential purposes. The FSB attributed the increase to the automation of certain repetitive tasks in prudential supervision.

 The pandemic prompted authorities to leverage more suptech tools in day-to-day supervision. Travel restrictions and social distancing protocols severely curtailed on-site inspections and led to a simultaneous shift of nearly all supervisory activities to an off-site surveillance approach. To help supervisors assess the prudential soundness of financial institutions remotely – including some tasks that were previously conducted on-site – authorities with existing suptech tools used them more extensively; at the same time, they also recognised the need to develop new data analytics tools for prudential purposes. Therefore, it is not surprising that authorities reported using, developing or experimenting with 71 discrete prudential supervisory tools as of this publication, up from only 12 tools in 2019.

 Broader technological developments facilitated the migration of supervisory activities to a virtual environment and underpinned the wider use of suptech tools for prudential purposes. Data management platforms, file exchange protocols, collaboration software and communication tools enabled the shift to virtual supervision, partially offsetting limited on-site inspections. Meanwhile, the growth of non-traditional data sources that can have a bearing on a firm's risk profile and the advent of new analytical tools to help process and analyse data – such as artificial intelligence and machine learning – provided authorities with opportunities to deploy a range of suptech tools for prudential supervision.

 This paper takes stock of suptech data analytics tools used for prudential purposes in 20 jurisdictions and explores the associated benefits, risks and implementation challenges. The findings are based on responses to an FSI survey by members of its Informal Suptech Network, combined with follow-up interviews with selected jurisdictions. Suptech data analytics for prudential supervision include tools to support supervisory risk assessments, such as credit, market, liquidity and operational risks and their implications for firm-wide earnings, capital adequacy and governance.

 The 71 prudential suptech tools examined in this paper are classified into three categories and subsequently divided into subcategories. The top-tier categories are based on the type of data the tools scrutinise and are labelled as follows: (i) "tools for qualitative data"; (ii) "tools for quantitative data"; and (iii) "tools for qualitative and quantitative data". Within each of the three categories are various subcategories that classify how the tools are used. Tools that rely on mainly qualitative data represent slightly more than half of those examined; these tools are used for text analysis, text summarisation, information classification or sentiment analysis. Tools that mainly look at quantitative data and those that utilise both quantitative and qualitative data account for approximately 25% of use cases each. The former is used for risk identification, while the latter may be used for network analysis, peer group identification or automation of inspections.

While suptech tools vary in design and purpose, all share at least one of two overarching objectives of extracting deeper supervisory insights and enhancing the efficiency of the supervision process. Tools that scan qualitative data often use natural language processing (NLP) and other artificial intelligence to comb through an astonishing array of materials to quickly find, summarise, classify and present relevant information for further review. These tools allow supervisors to consider a broader range of information in their prudential risk assessments. Tools that rely on quantitative data facilitate identification of high-risk banks and drivers of specific risks within banks, enabling a better allocation of supervisory resources. Tools that consider qualitative and quantitative data allow supervisors to assess relationships between entities that may not be apparent to the human eye; to enable construction of enhanced bank peer groups, facilitating more consistent supervision of firms with similar risk profiles; or to automate aspects of the inspection process, freeing up supervisory resources for higher-order tasks.

Suptech tools were widely deployed during the Covid-19 pandemic, particularly those that scrutinise qualitative data and support risk identification. The migration of on-site activities to off-site work, in conjunction with various ad hoc reports requested during the pandemic, added to the mounting stack of existing structured and unstructured data that required review. In the virtual environment, suptech tools proved indispensable, enabling supervisory reviews of corporate governance and asset quality, both of which are typically assessed on-site and often drive a firm's overall risk profile. NLP tools helped supervisors pinpoint corporate governance risks from voluminous documents that might otherwise not have been possible. Risk identification tools were also utilised to spot potential credit exposures that may be misclassified or underprovisioned, providing supervisors with a specific list of borrowers for follow-up.

Notwithstanding these tangible benefits, formidable implementation challenges remain, hampering wider adoption and acceptance of suptech tools. A key issue is the limited data science skills of supervisors. To address the skills gap, continued training of supervisors combined with hiring data scientists may help. Other critical issues involve data quality, particularly the unstructured data which underpin some suptech tools and the parameters that drive suptech outputs. An overly tight calibration might lead to the tool missing supervisory issues, while a very loose setting can result in flagging too many irrelevant issues. These challenges may point to a broader need to develop or update a suptech strategy that helps to facilitate supervisory buy-in and guide authorities' deployment of various suptech tools.

As suptech tools take on a greater role in prudential supervision, supervisory judgment may diminish. Suptech tools are automating lower-value, labour-intensive tasks and supporting higher-value, judgment-based functions. These trends are now accelerating, particularly the development of tools that target complex risk assessments that entail judgment. As these tools get operationalised, supervisors could rely less on their own judgment and depend more on the suptech output to identify key supervisory issues. If this transpires, it may lead to supervisory blind spots and a broader loss of institutional knowledge based on the art of judgment-based supervision. While authorities have emphasised that suptech tools support, rather than replace, supervisory judgment, explicit policies that acknowledge the tensions between, and outline the respective roles of, supervisory judgment and suptech tool outputs, could help.

Experience with virtual inspections and wider use of suptech tools have sparked a broader debate on the future of supervision. During the pandemic, authorities demonstrated the ability to shift all supervisory activities to an off-site stance. This has blurred the lines between on- and off-site roles, prompting a rethink on the modes of supervision in the post-pandemic, digital era. The shift to virtual supervision, however, was not frictionless. On the supervisory side, managing remote teams became a challenge; and while communication tools enabled virtual meetings, there are no good substitutes for in-person meetings with bank staff, which provide supervisors with critical insights on the quality of a bank's internal controls and risk management practices. On the technology front, the pandemic highlighted some gaps in authorities' own technological infrastructure, while exposing varied technological capabilities of supervised firms. While there will always be a crucial role for on-site inspections, there may be scope for more supervisory work to be conducted off-site, depending, in part, on the evolution of technological innovations, including the broader deployment of suptech tools in prudential supervision.