BANCA D'ITALIA
EUROSISTEMA

Leveraging technology: The Bank of Italy's SupTech Journey

Giuseppe Siani
Head of Regulatory and Supervisory Directorate of Banca d'Italia

First Supervision Conference of the Central Bank of Argentina
'Challenges of a Transforming Financial System

Buenos Aires, 13 November 2025

Introduction

I thank the organizers for inviting the Bank of Italy to this event where we can discuss topics that are highly relevant for both supervisors and market stakeholders.

The financial sector is undergoing a profound transformation, led by the rapid and strategic adoption of digital technologies. Digitalization has indeed become a strategic driver for banks, by enabling them to enhance operational efficiency, strengthening their risk analysis and management, improving service quality and deepening customer relationships, thus fostering their business model sustainability in an increasingly complex market.

Artificial intelligence (AI) plays a key role in explaining this market trend given that it materially affects digital strategies. Based on our evidence, AI adoption is accelerating, primarily driven by Generative AI (GenAI), which is expected to soon surpass more traditional AI techniques, thus opening new frontiers in data analysis, customer interaction, and risk management.

AI has also crossed a critical threshold: from specialized applications to a pervasive, general-purpose technology, that thanks to language models engages directly with human reasoning and fosters more efficient summarization, interpretation and decision support.

This marks a turning point for both financial institutions and supervisory authorities: our challenge is to evolve alongside the financial sector, leveraging technology to simplify supervisory processes, enhance analytical capabilities, improve risk detection and preserve intrusive and forward-looking supervision.

Today, I would like to focus on three main topics: technology potential to enhance supervisory activities; the relevant risks and challenges that supervisory authorities are called upon to address; the Bank of Italy's concrete experience with SupTech tools in prudential supervision.

Technology potential – the Supervisory Perspective

Effective banking supervision requires complex and interdependent assessments to identify traditional and emerging risks stemming from the digital transformation of the banking and financial sectors. These include risks related to value chain fragmentation, increased interconnections and operational dependencies across the financial ecosystem.

Supervisory activity should therefore follow an integrated approach and be carried out through a sort of circular process where different tasks[1] interact with each other to develop the necessary technical analysis of different risk profiles and the appropriate supervisory options. For example, experience gained through off- and on-site supervision facilitates the identification of new risks and the deeper understanding of market dynamics, which, in its turn, supports the necessary methodological reviews and influences both the international and the domestic regulatory processes.

Indeed, supervisory activities rely heavily on robust data analysis, drawing from long-standing data sources such as credit registers, regulatory reports, financial statements and targeted surveys. In addition, supervisors might leverage new and unstructured data sources, such as information drawn from the web, social media, and real-time market data. Moreover, innovation could improve supervisors' ability to massively extract insights from PDF documents and images, enabling broader exploitation of valuable documents (for example, board meeting minutes and other internal records), that often could remain underutilized. I will come back to this issue later.

Last, but surely not least, technology enhances supervisory capabilities by fostering the automation of routine tasks, unlocking deeper insights into existing analyses and, ultimately, helping faster and more informed decision-making.

Technology-related risks and challenges

Innovation, however, is not without risks. As we integrate advanced technologies into supervision, we face a range of challenges that must be addressed, such as data quality and interoperability, legal and ethical considerations, particularly those related to AI accountability and transparency, given the potential "black box" nature of more advanced algorithms.

To this end, two fundamental principles should guide supervisors' approach: keeping "human in the loop" and preserving accountability. As for the former, innovation must be embraced in a way that reinforces, rather than replaces, human judgment. It is therefore more appropriate to use the term "AI-assisted" rather than "AI-driven" supervision: AI supports informed, timely, and responsible decisions, strengthening – rather than overshadowing – the human dimension that underpins trust and integrity in financial oversight. Therefore, artificial intelligence, no matter how advanced, cannot replace the needed expertise and personal sensitivity of skilled supervisors.

---

[1] Specifically, rules and analytical methodologies developments, monitoring and control activities, horizontal risk identification and supervision.

As for the latter, the ability to track and document data, resources, processes and decisions supported by AI systems, as well as understand how they reach any specific decision, are a key prerequisite to build both trust and accountability of our work. Lacking that, we cannot be sure that our outcomes meet standards of fairness, compliance, and appropriateness, potentially undermining our institutional mission.

In order to mitigate these risks, we have adopted a few concrete measures that try to strengthen our internal governance, while embracing digital transformation: first of all, we have established a clear top-down governance mechanism where a high-level Steering Committee, composed by senior representatives from all involved departments, acts as a hub to oversee AI initiatives, promotes and coordinates their adoption, and thus ensures the necessary consistent and conscious innovation across our Institution.

This governance framework is complemented by the review of our internal policies and guidelines to ensure the responsible use of AI in banking supervision, aimed at preserving confidentiality, security, and transparency. It is also supported by internal dedicated communication to inform users of AI systems about not only their strengths, but also their limitations, and potential risks. I will elaborate on our internal approach further later.

The Bank of Italy's Suptech experience for prudential supervision

Financial supervisors all around the world are exploring how to leverage technology to enhance their activities. For example, over the past years, the Single Supervisory Mechanism (SSM) has increasingly taken advantage of innovative technology in its supervisory work, which the Bank of Italy has also contributed to.

As far as our internal process is concerned, we have implemented a comprehensive and coordinated supervisory approach to risk assessment: it involves integration of findings and measures from both on-site and off-site activities carried out by 'vertical' supervisory units with insights from 'horizontal' market-wide assessments and benchmarking. We also extend our responsibilities beyond banks and other financial intermediaries (e.g. asset management companies, servicers and payment institutions) to include third parties (for example IT outsourcers), thus promoting a broader holistic risk detection and assessment.

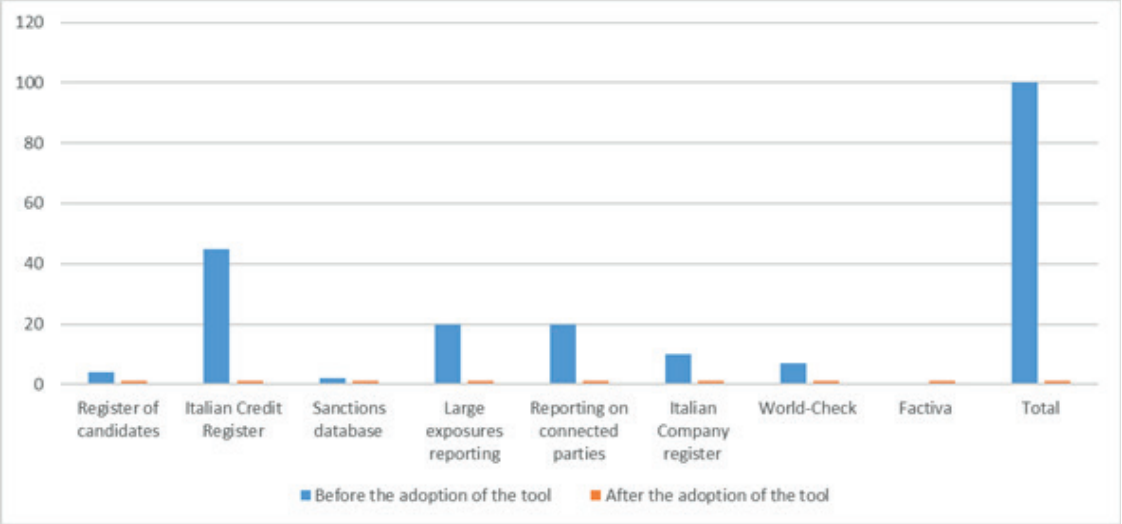
To support this activity, the Supervision Department has embarked on a structured "SupTech journey", which has so far fostered integration of advanced technologies into four selected prudential supervisory processes (three focused on off-site supervision and one on on-site supervision).

The first tool focuses on automating fit and proper assessments (FAP); each year we manage a few hundreds of candidate assessments that must be processed within a pre-defined timeframe; in the past, they were carried out manually by accessing multiple databases, thus making it highly time-consuming. Our tool allows for the automated extraction of data from both internal and external databases and incorporates reputational screening through AI-assisted analysis of press information.

Figure 1 highlights the improvements achieved following its implementation and helps assess the concrete benefits in terms of time reduction for data extraction (i.e. not in terms of overall time needed). Therefore, this tool mainly helps analysts on repetitive, time-consuming, low value-added tasks and might improve qualitative assessment through a sentiment analysis on appointee's reputation based on Natural Language Processing (NLP) techniques applied to global news sources[2]. This functionality draws the analysts' attention to news that could negatively impact candidate's reputation, thus enhancing the overall quality of the available information.

Figure 1

Time (minutes) needed for data extraction related to one FAP assessment



Source: Bank of Italy internal simulation.

The second tool relates to the assessment of ownership structures of supervised entities, which helps streamline those cases characterized by lengthy and complex chains of control. Thanks to Automated Reasoning (AR) technology applied to a Knowledge Graph[3], not only it integrates data drawn from multiple sources, but it can also infer the hidden relationships that are not explicitly stated in the original datasets, thus providing a deeper understanding of the underlying control structures. It also helps our supervisory analysts to elaborate their assessments further through "what if" analyses[4].

---

2 Factiva is a business information and research tool owned by Dow Jones & Company, which provides organizations with search, alerting, dissemination, and other information management capabilities (more than 32.000 sources such as newspapers, journals, magazines, television and radio transcripts, photos, etc.), sourced from nearly every country in the world in 28 languages. World-Check is a risk intelligence platform used by banks, insurance companies, and other institutions to support due diligence processes, anti-money laundering (AML), know your customer (KYC), and sanctions screening activities.

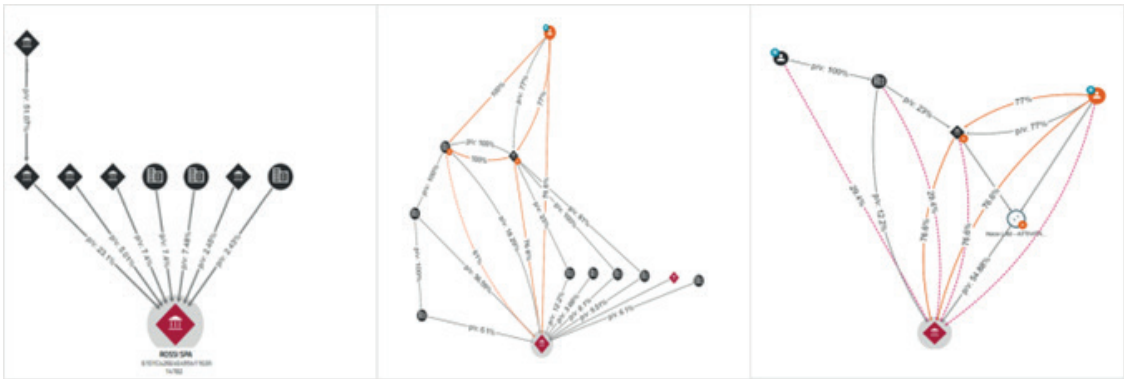
3 A Knowledge Graph (KG) is a data model particularly suited to deal with domains characterized by the presence of very large networks of entities having complex interconnections. It consists of a data source, typically a "graph database", enhanced and augmented with new knowledge generated with AI techniques (automated reasoning), by combining such sources and the available business experience.

4 A scenario simulation that allows to implement hypothetical changes by adding, removing and modifying existing participations.

The tool is intuitive and interactive; it allows to browse, filter, expand nodes and obtain detailed information, including the original data source. Figure 2 shows three examples of graph representations that are generated by the tool. The first one is a basic representation of direct participation in a supervised entity owned by different stakeholders. The second graph highlights indirect participations and control relationships, with the latter being identified by the orange lines. The last example shows a relation which is not included in the original data source and has been calculated via automated reasoning. This information is represented by the red dotted line in order to immediately alert analysts that it has been derived by the AI module and therefore needs additional validation by the competent analysts.

Figure 2

Examples of charts generated by the ownership structures tool



The third tool, recently developed, relates to the area of corporate governance; in particular, it supports deeper and more extensive analysis of banks' board minutes, which is traditionally performed during many supervisory controls (for example, during on-site inspections or thematic reviews). The tool indeed allows to identify specific Board members' taking the floor, track both the frequency and the tone of relevant interventions, as well as categorize the underlying discussion topics.

Therefore, it might enable supervisors to better assess boards' factual functioning and conduct thematic reviews on key issues such as internal controls, risk management and governance practices. It also improves benchmarking on qualitative aspects of governance, which promotes stronger interactions of our supervisors with corporate officers and, ultimately, enhances the board members' role.

Figures 3 and 4 present a hypothetical analysis designed to demonstrate the capabilities of the tool. This example compares the board of a single bank with those of other institutions, which act as a proxy for the broader domestic banking system; in particular, the first pie chart shows a lower percentage of dissent/challenge interventions, complemented by a higher percentage of acceptance interventions. The second pie chart shows a lower percentage of non-independent non-executives' interventions for the bank, compared to the system. Sharing this insight with the bank may contribute to raise awareness of the concrete dynamics within the board and support the adoption of appropriate actions.

Figure 3

Percentage of interventions by board members by tone and function

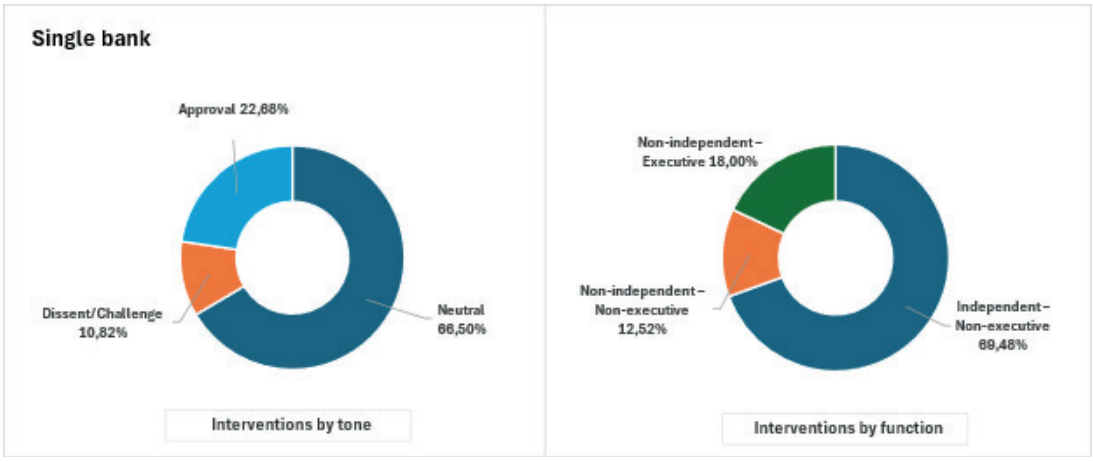
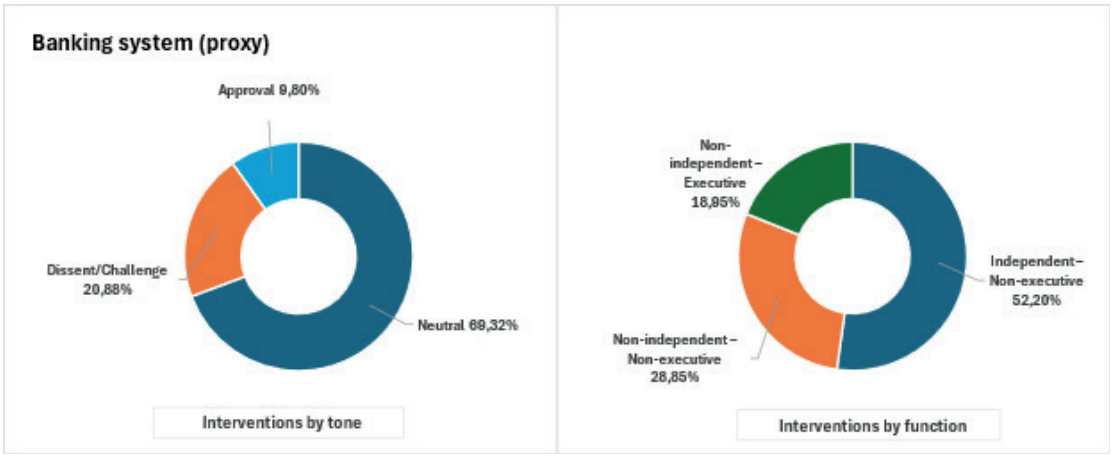


Figure 4

Proxy of banking system's percentage of interventions by tone and function



The fourth tool in our SupTech suite is designed to support on-site inspectors while drafting their findings and supporting the overall process of consistency checks across different on-site reports. In particular, the tool includes two application services: the first one provides AI-generated suggestions related to the findings being drafted or reviewed, while the second one allows to classify, search and consult by topic the applicable regulatory standards that must be mandatorily referred to in order to properly support the finding themselves.

This tool therefore supports the drafting process and helps enhance the accuracy and consistency of findings, while ensuring the secure and reliable handling of sensitive information included in the on-site reports, and preserving the necessary confidentiality throughout the process.

Despite their tangible benefits for the Bank of Italy's supervision works, these tools require our continuous risks monitoring and concrete mitigation efforts. Let me share four examples.

First, to ensure accurate and reliable outcomes both during the test and the adoption phases, we plan periodical reviews of our AI models even though they might create inefficiencies given that such activity is resource and time consuming. Second, we are implementing safeguard that helps mitigate operational risks, related for example to internal and external unauthorized access to supervision data and systems.

Furthermore, every AI-generated output undergoes the necessary validation by the competent supervisory analyst, whose professional judgment remains key to the process. This approach helps ensure that supervisory decisions are grounded in human reasoning and oversight, in line with the "human in the loop" principle, as stated previously.

The fourth mitigant measure relates to the integration of different skill sets through multidisciplinary teams: combining business expertise with specialized technical knowledge – supervisors, data scientists, engineers, and legal experts – demands strong coordination to ensure that every project delivers both regulatory compliance and technological innovation.

In this regard, the Bank of Italy is acting on two levels: recruiting specialist profiles and providing continuous technical and ethical training. In recent years, we have invested significantly in experts in innovative areas, such as artificial intelligence and blockchain, as well as cybersecurity and management engineering that are not always available in today's labor market. In addition, we are committed to strengthening the digital literacy and the ethic profile of our staff, as the future of supervision depends on human capabilities as much as on technology, and requires adaptability, curiosity, as well as ongoing commitment to continuous learning.

While these measures significantly reduce risks, we remain aware that AI technologies evolve rapidly and carry uncertainties that require ongoing oversight.

Conclusions

Integrating innovation into banking supervision cannot only imply upgrading ICT systems but, rather, represents a strategic priority to keep pace with the rapidly evolving financial and technological landscape.

The question is therefore no longer whether to use technology, but how to use it effectively, in order to strengthen our internal processes by improving efficiency, accuracy and gain additional qualitative insights into the risks faced by supervised entities.

This represents a continuous effort that requires addressing and monitoring the evolving challenges and risks, particularly those stemming from the AI. To this end, supervisory analysts must remain at the center of our strategies, not only by encouraging people to apply critical thinking and verify results through independent sources, but also fostering learning, and skills development and integration.

SupTech solutions also create opportunities for broader cooperation given that supervisors worldwide perform similar tasks and face comparable challenges, including

resources constrains; it is therefore essential for supervisors to leverage synergies, learning from each other by sharing concrete experiences and solutions. This collaborative approach will help reduce duplication of efforts, accelerate implementation and ultimately enhance our overall supervisory effectiveness.

Designed by the Printing and Publishing Division of the Bank of Italy