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**POLICY BRIEF:
BUILDING AI CAPACITY
IN CENTRAL BANKS:
A FOCUS ON THE WESTERN BALKANS**

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**Policy Brief: Building AI Capacity in Central
Banks: A Focus on the Western Balkans**

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Building AI Capacity in Central Banks: A Focus on the Western Balkans

Artificial intelligence (AI) is reshaping industries worldwide, with giant technological leaps in finance, medicine, education, and other fields. Central banks, as guardians of financial security and stability within the system, cannot be immune to this change, nor can their operations remain unaffected by its influence. In many central banks, AI is already being leveraged to improve forecasting accuracy, enhance supervisory efficiency, detect financial anomalies, and automate compliance tasks.

AI-powered tools for real-time fraud detection and compliance monitoring at the Bank of England, machine learning (ML) models for macroeconomic forecasting and sentiment analysis at the European Central Bank (ECB), and ML models for inflation forecasting and public communication strategies at the Federal Reserve are all examples of the efficient use of AI in central banking. These examples foreshadow a sweeping transformation in how central banks operate, make decisions, and engage with

the public in the age of artificial intelligence. Meanwhile, central banks in the Western Balkans are hindered mainly by systemic limitations, including IT infrastructure, fragmented data governance, and a lack of expertise in the fields of AI/ML. Yet, the transformative potential of AI holds the promise of greater financial stability and resilience, which is particularly compelling for markets in this region. However, without robust data governance and clear policy frameworks, adopting AI risks exposing central banks to privacy breaches, regulatory conflicts, and misuse of sensitive information. Failing to address these challenges could delay progress and undermine public trust in the digital transformation efforts of central banks.

Historically, the Western Balkans have proven to be highly vulnerable to economic shocks, necessitating that central banks actively seek greater resilience (Kovachevska Stefanova et al., 2025; World Bank, 2023). Despite growing interest, AI adoption within the region's central banks, currently a vital strategy in ensuring this resilience, is still in its infancy. Thus, there is an urgent need to explore how AI can effectively leverage institutional resilience and bolster financial oversight. This policy brief aims to examine the current readiness for AI adoption among central banks in the Western Balkans, identify the key structural and institutional obstacles impeding progress, and outline actionable policy recommendations. In doing so, it strives to provide a strategic roadmap for harnessing AI's full potential to enhance financial supervision, stability, and long-term economic resilience in the region.

AI in Central Banking – A Global Perspective

Artificial intelligence, as a general-purpose technology (GPT), has broad applicability and transformative power across sectors. In the central banks of advanced economies, AI is already beginning to share in the operations and decision-making processes. Its strengths in structuring unstructured data, generating predictive insights, and discovering patterns in large datasets present compelling use cases for monetary policy, financial supervision, and risk management. About a quarter of the central

banks surveyed in 2024 have fully implemented AI/ML models, with two-thirds having either some cases of AI use in the early production stage or some pilot projects. Only around 12% of the world's central banks have no engagement with AI/ML (Araujo et al., 2025). The most dominant AI use in central banks is related to areas such as:

- **Monetary Policy and Economic Forecasting.** With the inherent features of these models, which enable them to better handle large volumes of data and capture non-linear dependencies and relationships, they have become the foundation for enhancing macroeconomic forecasts and projections related to growth, inflation, and unemployment (Coulombe et al., 2022).
- **Financial Stability and Risk Assessment.** The ability to use unstructured data, textual data, and online learning enables AI/ML models to capture potential systemic banking and financial crises more accurately and efficiently than traditional models (Fouliard et al., 2021).
- **Regulatory and Supervisory Functions.** Even some of the early AI models related to anomaly detection were able to provide adequate signals for regulators about the potential fraud and/or misconduct in the private sector (Breedon, 2024).
- **Communication and Sentiment Analysis.** It is well known that statements by central bank governors, such as those from the Fed Chair, have a measurable impact on financial markets, often shifting investor expectations and influencing volatility. Some of the recent AI-developed models provide more accurate interpretations of central bank communication, classification (within hawkish/dovish sentiment), and are even able to extract implied forecasts from public statements (Pfeifer and Marohl, 2023).

In addition to these benefits for internal operations and mandated functions of central banks, there is an increasing external driver for central banks' AI usage, as seen in the growing interest from the private sector and commercial banks. As commercial banks deploy increasingly opaque models, supervisors must

understand, audit, and regulate these tools. Issues such as algorithmic fairness, transparency, and accountability require central banks to develop in-house AI competencies not just for efficiency, but to uphold democratic and ethical standards. As Shin (2024) emphasizes, instead of just adopting AI, central banks need to guide its governance. This generally includes shaping the frameworks for responsible AI use in financial systems by ensuring data quality, algorithmic transparency, and accountability standards. Central banks must act not only as users of AI tools but also as standard-setters who steer their safe and ethical integration across the financial sector.

AI in Western Balkans Central Banking

This policy brief draws on an in-depth qualitative study conducted to examine AI readiness in six central banks in the Western Balkans, including Croatia, a regional neighbor, but excluding Kosovo. The methodology centered on expert surveys with senior professionals in leadership roles, including chief economists, IT directors, advisors to governors, and other department heads. These interviews took place between February and April 2025. The study utilized a framework adapted from Jöhnk et al. (2021), which identified five pillars of institutional AI readiness: strategic alignment, resources, knowledge, organizational culture, and data infrastructure. *Strategic alignment* refers to the potential for organizational fit and compatibility with the overall AI integration goals. *Resources* encompass all potential technical and financial resources required for the successful implementation of AI. *Knowledge* refers to the specific skills and expertise within the organization that could be utilized to understand and develop AI solutions. *Culture* refers to the overall mindset of the organization towards innovations. Lastly, *data*, one of the crucial elements in assessing AI readiness, comprises the relevant amount and types of data needed for AI models to be trained and generate accurate predictions. These are evaluated based on several questions that measure each pillar. Questions are designed on the scales 1 to 5, with detailed qualitative descriptions for each level (e.g. *How smoothly does financial and economic data move between systems, departments, and AI models for decision-making*).

ing? 1) Data is siloed and not shared between departments or AI applications, 2) Some manual data transfer exist, but processes are slow and inefficient, 3) Data moves between departments with delays, requiring manual intervention for AI integration, 4) Data is semi-automated, allowing for relatively efficient integration with AI models, 5) Real-time, fully automated data pipelines enable seamless AI-driven decision-making). Such a design also allows for a deeper understanding of the reasons behind some of the weaker performance of specific pillars. In the analysis, the answers are transferred to numerical form and averaged across pillars (Figure 1). These questions are also supplemented with both closed-ended and open-ended questions of interest to facilitate a deeper examination of perceived risks, benefits, and the future of AI integration (e.g., *Which of the following do you perceive as the greatest risks or challenges in adopting AI? (select up to three options) (i) Data privacy and security risk, (ii) Bias and fairness issues in AI decision-making, (iii) Regulatory and compliance challenges, (iv) Over-reliance on AI, reducing human oversight, (v) Lack of AI expertise within the central bank, (vi) High implementation costs, (vii) Resistance from employees due to fear of job displacement, (viii) Reliability of AI-generated economic predictions, and (ix) others - please elaborate more.* The open-ended questions were as follows: *What do you think is the biggest benefit AI can bring to central banking? or What key steps do you think central banks should take to ensure responsible AI adoption?*). Overall, such a question design allows for the evaluation of the five pillars according to the Jöhnk et al. (2021) framework, as well as a deeper analysis outside this framework, accounting for the specificities of central banks.

Survey results reveal a generally limited level of AI readiness among central banks in the Western Balkans. Despite growing awareness of the necessity for AI integration, no institution demonstrates high preparedness in any of the five dimensions. The findings also show some variations among the countries. While Serbia, Montenegro, and Croatia demonstrate relative strength in areas such as knowledge and culture, they remain constrained by outdated data systems and inadequate governance integration. Other countries in the sample seem to show

uniform gaps across all readiness dimensions, reflecting under-developed digital strategies and a lack of AI-specific leadership structures (Figure 1).

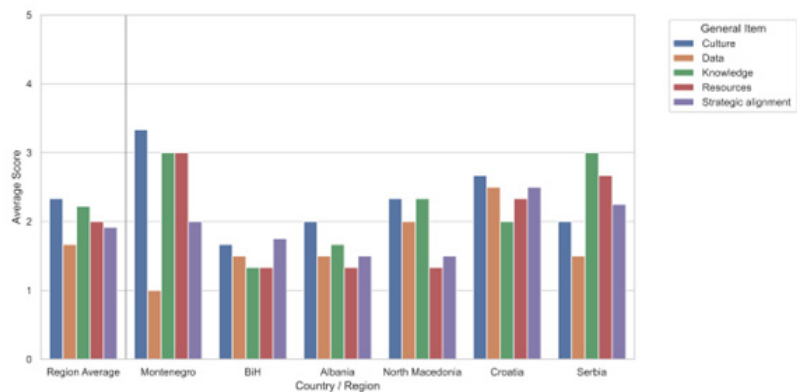


Figure 1. Average Score by Country/Region

Some of the key challenges identified across the region include:

- **Fragmented strategic alignment.** Generally, none of the banks in the sample have integrated AI into their core objectives. Some initiatives, if any, are pilot-based, largely disconnected from institutional planning. Ultimately, this limits the scalability of the initiatives and the reason for further resources.
- **Legacy data infrastructure.** This is one of the common issues identified in all central banks. Since AI systems rely on clean and accessible data, central banks are still dependent on fragmented databases, siloed across different departments, and outdated IT infrastructure. Thus, this will present a major structural barrier to AI integration.
- **Human capital constraints.** While this is a relatively novel area of industry, human capital is not abundant. Respondents of the survey emphasized a shortage of staff with proper and actionable knowledge in fields such as machine learning, data science, and algorithmic ethics. As a result, most of the

institutions surveyed lack a structured pipeline for creating such expertise internally and retaining a limited pool of qualified experts.

- **Cultural and organizational inertia.** While central banks in the region have traditionally employed highly educated and expert staff, they are also characterized by risk aversion, slow adaptability, and strong hierarchical structures – traits that tend to hinder innovation. Additionally, there is some resistance to delegating decision-making tasks to algorithmic systems. This is, however, not without reason, given the potential for reputational damage and ethical concerns. Nevertheless, avoidance may not be a proper mitigation strategy here.
- **Regulatory and governance uncertainty.** None of the surveyed central banks have clear internal AI policies and an in-house regulatory framework, which is a significant obstacle for the scaling of AI use. Without legal clarity, central banks are hesitant to experiment with complex or opaque tools. However, as a governing monetary authority, central banks should be the ones to push this on the public discourse agenda.

More broadly, the findings of this study suggest that AI adoption in central banks is not merely a technological deployment but a full-scale institutional transformation. There is also a consensus among respondents that AI will impact central banking operations significantly over the next five years. Many respondents anticipate a progressive uptake over the next period, with early focus on compliance automation, data analytics, and operational efficiency. With a growing number of private financial institutions taking on AI-enhanced analytics and automated decision-making, central banks must act decisively to maintain their capacity to supervise, regulate, and guide these developments. Failing to do so could weaken their oversight and jeopardize both credibility and operational effectiveness. Undeniably, central banks in the Western Balkans face numerous capacity constraints; however, they also have a limited strategic window to adopt AI governance models aligned with ethical principles, democratic values, and data transparency.

Policy recommendations

represents a strategic opportunity for central banks in the Western Balkans. However, capturing this opportunity requires intentional planning, sustained investment, and clear leadership. The study has shown that there is a clear recognition of the benefits of AI for central banking; however, these institutions are still lacking the capabilities to deploy AI systems on a large scale. To close this readiness gap, this policy brief recommends the following six priority actions:

- **Integrate AI into Core Strategic Mandates.** The integration of AI should not be based on isolated, ad-hoc innovation projects or confined to experimental units. Central banks should embed AI into their strategic objectives, ensuring alignment with core mandates such as financial stability, monetary policy, and risk management. It should involve developing specific AI goals, including them as part of their annual strategies, allocating specific budgets, and linking performance indicators to AI initiatives.
- **Establish Internal AI Units and Governance Structures.** Many leading central banks recognize the importance and potential of AI and have created dedicated AI coordination roles (e.g., chief data officer, innovation director). This is necessary for unifying fragmented efforts and proper oversight. Dedicated units should manage AI implementation strategies, ensure proper collaboration across departments, and provide guidance on model development, deployment, and evaluation. Such units should also address ethical concerns, transparency issues with AI models, and risk mitigation protocols.
- **Upgrade Data Infrastructure and Standardize Governance.** There are several ways central banks should deal with the issue of poor data quality, siloed systems, and outdated legacy infrastructure, which are key concerns for AI readiness in central banks. They must modernize their IT environment by digitizing data flows, integrating databases, and adopting platforms that support AI workloads (e.g., high-performance computing and/or cloud computing). Establishing clear data governance frameworks, such as defining ownership, access

rights, and auditability, will essentially ensure data integrity and reduce systemic risk.

- **Invest in Technical and Ethical In-House AI Competencies.** It was recognized that the lack of human capital is a significant obstacle to creating scalable AI models within these banks. Central banks should identify in-house professionals with AI specializations or interests who are eager to expand their knowledge and transfer their know-how within their institutions. Moreover, through institutional partnerships with universities, international financial institutions, and regional initiatives, central banks should launch targeted programs that address both technical knowledge (e.g., machine learning and data science) and non-technical competencies (e.g., ethics, regulation).
- **Develop Regional Initiatives and Knowledge Exchange.** While recognizing that these are relatively small central banks, regional initiatives and joint projects could be crucial for AI adoption. Central banks in the Western Balkans face common obstacles, including limited resources, outdated systems and data governance structures, and a shortage of human capital. Establishing regional platforms would facilitate peer learning, co-development of tools, and alignment with EU frameworks. Joint training programs, pooled investments in AI pilots, and shared use of regulatory sandboxes are practical steps toward collaborative progress.
- **Update Legal and Regulatory Frameworks.** AI has become widespread, and there is no doubt that it will become even more prevalent in the future. The use of AI tools by the private sector mandates that central banks strengthen their supervisory capabilities. To achieve this, central banks should first develop their internal AI guidelines and establish minimum standards for explainability and accountability, ensuring legal clarity and public trust. Engagement with international standard-setting bodies can also help central banks stay aligned with evolving global norms.

Artificial intelligence will not wait. AI use will not decline; it will only increase in the coming years. AI tools and models will become more sophisticated and opaque. In recent years, we



have witnessed an unprecedented pace of AI development in technology. This means that central banks must either prepare for a supervisory future driven by advanced analytics or risk becoming reactive and obsolete. Central banks in the Western Balkans now have the opportunity to define their future trajectory, leveraging their shared challenges to build a coordinated, ethical, and resilient approach to AI adoption, or neglect the clear change and put the whole financial system at risk.

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