

Artificial Intelligence and its Applications in Central Banks: A Comparative Analysis and Case Study of the Bank of Algeria

Hichem Dekdouk¹

¹ Department of Accounting and Financial Management, Institute for Distance Learning and Postgraduate Studies, Frontier University, Garowe, Puntland, (Somalia), hichem.dekdouk@gmail.com

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Abstract:

This paper examines how central banks adopt and apply Artificial Intelligence (AI), paying particular attention to the case of the Central Bank of Algeria. Using a comparative study based on a 2024 survey by the Bank for International Settlements' Irving Fisher Committee of sixty "60" central banks, we examine general patterns of AI adoption, governance challenges, and the ways in which AI is used in operations; Eighty-eight percent (88%) of central banks use generative AI, and its most common applications are statistics, cyber security and economic research. But only twenty-five percent (25%) have reached operational production. Algeria has tremendous opportunities through its Vision 2030 and the digital transformation of its banking sector. However; there are problems and challenges with technology infrastructure, data governance and people training. This study also contributes to the evolving literature on AI in central banks, by providing a perspective from emerging economies in the MENA region.

Keywords: Artificial Intelligence IA, Central Banks, Numerical Change, Bank of Algeria.

Jel Classification Codes: C45, E58, G21, O33, O55.

1. Introduction:

The fourth-generation or so-called digital revolution is changing the structure of the entire global financial system and artificial intelligence is a key factor in driving these changes, affecting the operations and strategies of major financial institutions. Central banks protecting monetary and financial stability are now leading this technological change, actively researching how to improve AI, for the duties and tasks for which it exists (Bank for International Settlements [BIS], 2024, pp. 114-150).

Generative AI, especially large language models (LLMs), are being accepted at a faster rate. It can now be used for a range of functions, such as making better economic forecasts and improving banking supervision (Araujo et al., 2025, pp. 1-45). This new and effective digital technology offers ways and means to deal with large, large and unstructured data, automating and digitizing processes that are difficult to deal with, and obtaining analytical insights at the same time.

Integrating AI into central banks raises important questions. These focus on governance, risk management and ensuring equitable access for all parties to technological and digital benefits across both developed and developing economies. These problems pose special difficulties for central banks in developing countries. Therefore, they must find a balance between new available opportunities, constraints and risks imposed on scarce and scarce resources, unstructured and inadequate infrastructure and fragile financial institutions.

Recent academic literature on AI in central banks shows a rapidly changing field. Georgieva (2023) points to potential uses of machine learning in how monetary policy is implemented, mostly to improve information and data transmission tools and to predict macroeconomic factors (Georgieva, 2023, pp. 177-199). For its part, the Bank of Canada has created a practical way to deal with artificial intelligence, and uses this to predict inflation and study economic sentiment (Macklem, T, 2024).

A large number of potential generative AI applications counted more than 40 according to the European Central Bank (ECB), demonstrating a high potential for widespread use of this new technology (Banque Centrale Européenne [BCE], 2024).

Algeria offers a valuable case study when looking at the larger global picture. As a developing economy in the MENA region, Algeria is undergoing ambitious economic change through its Vision 2030 (Bencheikh, T., Guemoula, B. 2024), which seeks to diversify its economy away from the rentier economy of oil and gas production .The Bank of

Algeria, as the country's central bank, plays a key role in Algeria's economic and monetary transformation and must adapt its activities to assist in this digital transformation towards the adoption of new technologies.

There is a significant gap in the current work on how central banks in emerging or developing economies, in the MENA region in particular, are adopting AI. Many of the current studies focus on central banks in developed countries. This creates a lack of knowledge about the specific new issues and opportunities that exist in growing or emerging economies.

This paper aims to bridge this knowledge and technology gap by asking: How are global central banks adopting AI, and what are the specific impacts on growing and developing economies? As a case study, the Central Bank of Algeria will be used.

The objectives of our research consist of three main parts. First, we examine and analyze how central banks are embracing AI around the world, using recent data from the Irving Fisher Commission Survey conducted by the Bank for International Settlements in 2024 with 60 institutions. Second, we look at governance problems and risk management structures related to AI in central banks. Third, we conduct a detailed case study on the Bank of Algeria, examining its place in the transition to digital banking in Algeria and the opportunities to use AI in its required and legal duties.

This research provides some new insights into the field. Using existing raw data, it gives a fresh look at how advanced and developing economies are embracing AI. It also has the first in-depth academic analysis of what artificial intelligence means for the Bank of Algeria, within the broader digital transformation of the Algerian financial system. The study concludes with focused advice for vernacular central banks in growing or developing economies, based on their own limits and potential.

1.1 Method:

This paper uses a mixed-methods course of study, combining the analysis and comparison of documents and studies with the case study of the Central Bank of Algeria. In this way, the accuracy of numerical analysis of general trends is combined with the contextual depth of a qualitative overview of the Algerian situation.

1.2 Research approach:

Our methodological framework consists of two parts. First, we will conduct a review of documents to see trends, problems, and the best methods used by international central banks around the world for AI. This

comparison allows us to see how Algeria fits into the world and what is special because of its status as a developing or developing economy.

The second part is a case study of the Bank of Algeria. This method is appropriate when the goal is to examine complex topics in their natural environment, such as how global financial institutions adopt technology (Yin, 2018, pp. 25-50). The case study of the Central Bank of Algeria allows for a thorough and complete examination of institutional transformations, specific constraints and opportunities for innovation in Algeria.

1.3 Sources:

Our main data sources come from the Irving Fisher Committee Survey of Central Bank Statistics 2024 (IFC) from the Bank for International Settlements. This survey was given to sixty "60" central banks on all continents (Araujo et al., 2025, pp. 1-45). The study conducted between September and November 2024 covers six key areas: scope and interest in AI, expectations, applications, regulatory and governance policies, IT infrastructure, and collaborative strategies. The figures from this survey are the basis for our comparative analysis.

In the case of Algeria, this study uses the Bank of Algeria's 2023 and 2024 annual reports, along with the Algerian government's economic policy papers related to Vision 2030. These official sources are complemented by recent academic publications on the digital transformation of the Algerian banking sector and industry reports on the fintech ecosystem in Algeria (Santosdiaz, 2025).

Our secondary sources consist of academic publications indexed in Scopus-Web of Science databases (2025-2023), along with reports from institutions such as the Bank for International Settlements, the International Monetary Fund, the World Bank, and major central banks such as the European Central Bank, the Federal Reserve, the Bank of Canada, and the Bank of France that have released materials on artificial intelligence.

1.4 Analysis Framework:

Our analytical framework is structured around three interrelated theoretical dimensions. The initial focus is on how technology is approached and examined through institutional innovation diffusion models. We examine the factors that help and barriers to the adoption of AI, noting the specific characteristics of developed and growing economies.

The second area relates to the governance and handling of AI-related risks. This study examines the increase in new regulatory

frameworks, forward-looking approaches and mechanisms, and ways to address operational, ethical and systemic risk management, related to artificial intelligence in central banks.

The third dimension explores artificial intelligence and its applications within the core functions and tasks of central banks, including the implementation of fiscal and monetary policy, banking supervision and supervision, as well as the maintenance of monetary and financial stability, the production of fiat and monetary currencies, and the management of the payment system. This helps judge how AI can really help central banks do their jobs better.

1.5 Methodological Limits:

This research had some limitations in how it was conducted. First, our study of the Algerian case relies mostly on secondary sources because we were unable to survey Bank of Algeria officials directly. This prevents us from fully understanding the inner workings and nonpublic strategies of the group.

Second, because AI technologies are changing so quickly, some of the data collected in 2024 may quickly become obsolete, potentially reducing how long our results remain relevant. Third, when applying our findings on Algeria to other developing countries, caution is advised as each country has its own specific circumstances and environment.

Finally, limited access to specific quantitative data on the Bank of Algeria's AI initiatives limits our ability to conduct a robust empirical assessment of the impact of these technologies on institutional performance.

1.6 Limitations of the Study:

This study has some limitations that should be known for the proper evaluation of its work and what it means. These limits change, due to the methods of the study and its preparation, the extent to which the results can be generalized and applied.

- ✓ **Restrictions on information and data:** Our view of the Bank of Algeria is mostly based on available public documents and reports because we have not spoken directly to the responsible persons at the Central Bank of Algeria. Therefore, we cannot review the strategies used within the bank and analyze the opportunities, risks and ongoing projects. We have not been able to access inside information about AI strategies, failed applications, and informal lessons, which may make our assessment of opportunities and problems somewhat unbalanced, despite the existence of the

Directorate General of Information Systems, which was established in August 2025.

- ✓ **Terrible or rapid digital change:** The field of artificial intelligence is experiencing rapid technological progress, including innovations of models, applications and framework. Although recent when written, the data collected in 2024–2025 may soon become obsolete. This dynamic affects the accuracy of our technical and strategic suggestions, requiring regular updates to the analysis.
- ✓ **Limitations of generalizations:** The research study aims to provide general insights relevant to economies or developing countries. However, given Algeria's reliance on a reactionary “oil and gas” economy, along with its financial and banking structures and geopolitical position, generalizing these findings to other developing or developing countries could be a serious mistake.
- ✓ **Limited quantitative data and information:** Official reports issued by the Bank of Algeria give useful details on general economic trends. But they lack specific figures about technology projects, AI investments, and how successful modernization projects are. For this reason, we must make educated guesses and use qualitative assessments when accurate numbers allow for a stronger study.
- ✓ **There is publication bias:** the analysis is based on reports and documents submitted by the Central Bank of Algeria and official bodies such as the Ministry of Finance. These sources tend to amplify and show false success rather than true failure. This preference for positive results is exaggerated and gives a false estimate about the advantages of artificial intelligence within the Central Bank of Algeria. It may also underestimate the problems related to putting AI into practice. This bias affects the objectivity of our assessment.
- ✓ **Time constraints in analysis:** The relatively short surveillance window (2023–2025) limits what we can say about the long-term effects of central banks' adoption of AI. The transformative effects of these technologies may take years to fully manifest, making any eventual assessment of their utility and system-wide impact premature.
- ✓ **Limitations and complexities of impact assessment:** It is difficult to assess the true impact. It's hard to say with certainty that when central banks are using AI and improving, AI is the real reason. This is especially true if we do not have a control group of experimental

or observational frames. Notable improvements may stem from simultaneous factors. This makes it difficult to know if AI is really what made the difference.

Going forward, the research can focus on some key points. Long-term studies using real-world data can examine how AI changes central bank outcomes over time. Surveys of those working in these places can give us a useful view of the actual issues and the steps needed to achieve positive results. Detailed studies combined from new economies may explain which environmental elements are most important for the use of well-functioning AI.

To link the use of AI to better outcomes in central banks, robust impact assessments using quasi-experimental methods are needed. Also, more empirical research and work needs to be done by researchers in the field to understand how AI affects central banks in particular and society in general, such as changes in jobs, equal access to financial services, and public trust.

In order for the adoption and use of AI to truly enhance how well central banks perform and process, robust impact assessments using scientific, experimental or quasi-experimental algorithms and designs are vital. More field and scientific work should also examine the societal impact of AI when central banks use technology. This also includes looking at shifts in employment and its effects, equality and equity in access to finance and financial services, and how the public perceives and trusts these central banks.

2. Global view of central banks' adoption of AI:

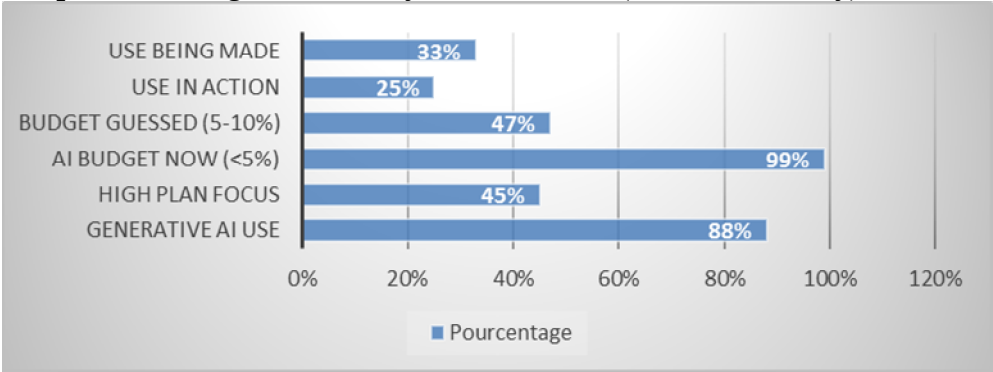
The 2024 survey from the bis Irving Fisher Commission shows that many central banks are interested in AI data from “60” central banking institutions globally suggest that AI integration is underway, but its prevalence varies depending on geography and economic situation.

The most obvious metric involves the acceptance of generative AI: 88% of central banks surveyed reported using generative AI tools, most or most of them for text and code making (Araujo et al., 2025, pp.6). This near-universal acceptance show how attractive these technologies are, especially since they are easy to use for non-experts due to simple conversational interfaces.

The survey on strategic priorities showed that 45% of participants, represented by central banks, consider artificial intelligence to be a high strategic priority, especially in the Asia and Oceania region, where rates are very high. This prioritization is reflected in projected budget

allocations: while less than five percent (5%) of the budget is currently allocated to AI projects in most organizations, forty-seven percent (47%) of respondents expect to invest between five percent (5%) and ten percent (10%) of their budget in AI over the next three years (Araujo et al., 2025, pp. 6).

Graph 1: AI Usage Statistics by Central Banks (IFC 2024 Survey)



Source: BIS 2025. Governance and Implementation of Artificial Intelligence in Central Banks: 2024 Survey (Chapter III, pp. 114-150).

Initial interest in AI is high, but its practical application in central banks is still very limited. Preliminary data shows that only about twenty-five percent (25%) of central banks have applied AI in their daily and strategic operations. About thirty-three percent (33%) are still in the development and testing stages. These figures suggest that many central banks are currently experimenting with AI rather than integrating it into core functions and tasks.

Table 1: Key AI Application Areas for Central Banks (Impact Scores)

Area	Impact Score	Main Uses
Cyber Security	4.5 / 5	Threat detection, event response
Statistics	4.2 / 5	Data processing, outlier detection
Economic Research	4.2 / 5	Nowcasting, analytical forecasting
Financial Stability	3.8 / 5	Risk monitoring, stress testing
Monetary Policy	3.5 / 5	Forecasting, model

		building
Supervision	3.3 / 5	Compliance checking, reporting

Source: Prepared by the researcher based on search paper of Georgieva, S. (2023). Application of Artificial Intelligence and Machine Learning in the Conduct of Monetary Policy by Central Banks. *Economic Studies*, 8(1), 177-199.

Priority application areas focus on three key sectors. In first place is cyber security, with an expected impact score of 4.5/5, reflecting rising concerns about cyber attack, hacking, and complex digital risks. Statistics and economic research received a score of 4.2/5, demonstrating that AI can improve the quality and speed of macroeconomic analyses. Financial stability follows the score of 3.8/5, citing opportunities to use AI for early detection of systemic risks (Financial Stability Board [FSB], 2024, pp. 13-28).

The best organizations are showing how AI can change things. For example, the European Central Bank has identified more than 40 ways in which generative AI can help oversee banks, such as automatically reviewing documents and writing reports (McCaul, 2024). The Bank of Canada also uses machine learning to predict faster, stronger and better real-time inflation, in the very near term, using real-time data and information (Macklem, T, 2024). The US Federal Reserve is also using artificial intelligence to study Federal Open Market Committee (FOMC) talks, pulling hard numbers from the text (Dunn et al., 2024).

These examples show that AI adds real value by automating repetitive and time-intensive tasks. It can help make analysis healthier by working with amounts of data that people can't handle on their own. It can speed up decisions by analyzing information as it arrives.

3. Governance and AI Issues for Central Banks:

For central banks, AI governance is a key issue. Needs to change existing risk management and data governance systems. The bis survey shows that governance readiness varies, with significant differences between rich and developing countries.

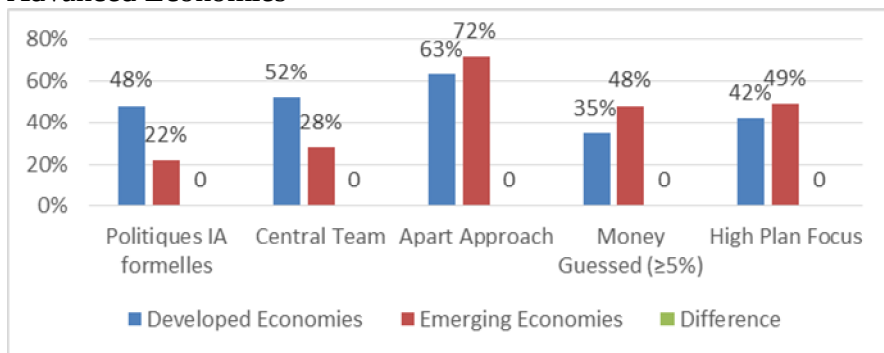
Based on a very recent survey, thirty-two percent (32%) of central banks have internal AI policies, but only five percent (5%) have issued these policies and they have become publicly available (Araujo et al., 2025, pp. 1-45)

There are great difficulties in setting appropriate regulatory and ethical standards due to the novelty of artificial intelligence. It should be noted that thirty percent (30%) of central banks are actively creating these policies, indicating a growing recognition of their requirements.

The risks identified by central banks show a clear order of concern that organizations prioritize data privacy, with seventy-five percent (75%) currently limiting the use of external AI tools when dealing with sensitive information (Brousse et al., 2024, pp. 70-85). This concern justifies the risk of confidential information leaking to third-party platforms, as evidenced by documented cases of employees inadvertently sending sensitive data to Chat GPT.

Cyber security, a sensitive and very important focus, is a major concern, scoring 4.7 out of 5, as the integration of artificial intelligence can expose the main systems of central banks to threats. Algorithmic biases are a concern that needs to be addressed, ranking third with a score of 3.9 out of 5. This demonstrates concerns that the choices algorithms make may not be fair or obvious when used in government policy.

Graph 2: Comparison of AI Governance between Emerging and Advanced Economies



Source: Prepared by the researcher based on FII Institute. Closing the AI Gap between High-Income Countries and Emerging Economies (Report 1. pp. 1-8).

Comparing developed and emerging economies shows different governance styles. Central banks in advanced economies often use a centralized coordination approach (fifty-two percent 52% versus twenty-eight percent 28% for emerging economies). This suggests that they are better able to deal with the organizational complexity of AI (Ben Amor, Y. 2024, pp. 1-8). On the other hand, emerging economies prefer a decentralized approach (seventy-two percent 72% versus sixty-three percent 63%), perhaps due to limited centralized resources or a more flexible organizational culture (Gambacorta, et al., 2025, pp. 3-9).

Also interesting, developing or growing economies show a stronger intention to invest in AI, with 48% planning to allocate at least 5% of their budget to it, compared to only 35% of advanced economies (Araujo et al.,

2025, pp. 6). This difference may show technological progress or a clearer view of opportunities for technological advancement.

Central banks manage risk mainly by changing the systems they already have in place. The most commonly used methods include limiting access to external AI tools (seventy-five percent 75% of central banks), using secure testing spaces for AI experiments, and applying AI-manufactured data sorting rules.

Central bank board's often deal with ethical oversight. This shows that AI ethics are important among decision-makers. This method demonstrates that AI is a challenge for corporate governance, not just a technical one.

4. The case of the Bank of Algeria and the Algerian context:

Algeria is going through a period of economic and technological change. This creates a supportive but complex position for the central bank to adopt AI. The Algerian government's Vision 2030 plan emphasizes creating economic diversification and modernizing monetary and financial affairs. Digital and informational innovation are seen as a very important factor in the equation for this growth (Kaidi, T., Merabet, S, A. 2025).

Algeria's digital environment shows encouraging signs of embracing advanced technology. Data from the U.S. Department of Commerce indicates that Algeria had 33.49 million Internet users in the first quarter of 2024. This represents about seventy-two-point nine percent of the total population, indicating steady annual growth (U.S. International Trade Administration, 2024). This large internet access provides a solid base for growing AI applications that need strong connectivity.

Digital change in the Algerian banking sector has reached some key steps recently. In October 2024, Algeria created a new legal framework for digital banks, marking a regulatory step to modernize its banking system (Bank of Algeria, 2024, pp 1-4). This regulatory change provides better space for technical improvements, possibly including the use of AI tools for banking and surveillance.

The fintech environment in Algeria is new but shows increased entrepreneurial activity. Startups like Yasser, which became the country's most-funded startup in 2023, Banksy, a mobile bank, DFA, an open banking platform, and ESREF Pay, a digital wallet, are showing technological innovation in financial services [22] (Santosdiaz, 2023). These rapid and terrible transformations are fostering a technologically more complex landscape than usual, which may ease the way for central banks to embrace these digital advances such as artificial intelligence.

Algeria's digital payment structure is based on two main public entities: GIE monetique and SATIM. They have been pivotal in making

banking digital. These clusters are potential starting points for adding AI solutions to the payment system, mainly to find fraud and make transactions better.

Table 2: Fintech and the Digital System in Algeria (2024)

Category	Key	function
Central Rule Maker	Bank Of Algeria	Control, money print
Payment System	GIE Monétique, SATIM	Card use, Transformations
Post Help	Algeria Poste	Money in, digital help
New Fintech	Yassir, Banxy, ESREF Pay	Financial innovation service's
Finance	Algerian Startup	30k\$-1M\$ tickets investissement

Source: Prepared by the researcher based on Annual Report 2024 for Bank of Algeria (Edition 2025).

The Bank of Algeria's 2024 annual report indicates changes showing a gradual evolution towards technological modernization. Money supply (M2) increased by nine point zero three percent 9.03%, and loans to the economy grew by five point three percent 5.3% by the end of 2024, reaching 6,688.9 billion dinars for the private sector (Bank of Algeria, 2025). Rising banking activity is driving demand for data processing and analysis, suggesting that AI may offer valuable support.

The Central Bank of Algeria, represented by the Bank of Algeria, faces significant challenges, especially when introducing artificial intelligence, mostly because financial inclusion is limited, especially for small and medium-sized companies (PME & PMI).

These SMEs have lower financial inclusion rate levels in North Africa and the Middle East region (Barajas et al., 2020, pp. 1-40). This shortage affects the amount of various transactional information needed and necessary to effectively and correctly train AI models.

Even with continued expansion, technology infrastructure requires significant and massive investments to support complex AI programs. The very demanding computational needs of AI, specifically for deep learning and processing large datasets, require high-level computing capabilities. This can be costly for schools in developing economies.

Human capital is a major challenge. Intensive training programs are needed to build skills for practical use and good management of AI. This need is particularly important as global competition for AI talent grows, putting pressure on salaries and retaining skilled workers.

Despite these challenges, the Bank of Algeria has many strategic opportunities. It requires them to move quickly towards economic diversification and better monitoring and evaluation, an area where AI can help. Better macroeconomic forecasts through AI can greatly help the quality of monetary policy during a complex economic transformation.

International cooperation in centralized banking AI, such as the innovation hub of the Belt and Road Initiative, provides opportunities for learning and technology transfer. This could make it faster for the Bank of Algeria to adopt AI and reduce in-house development costs.

5. Discussion of the results:

5.1 Central Banks and AI Opportunities:

Analysis of information and reports as well as data suggest that AI provides central banks with valuable opportunities to improve their operational and operational frameworks. This is very important to streamline processes and enhance decision support. These opportunities emerge in three key areas: improved economic forecasting enhanced supervision and streamlined banking operations.

According to the Bank for International Settlements, AI has the potential to increase 9% in total factor productivity (TFP) over a decade if AI becomes popular. This is mostly done through the automation of complex analytical tasks and the use of previously unusable datasets (BIS, 2025, pp. 4-10).

This boost will be particularly useful for central banks in emerging economies, where the quality of macroeconomic data and analytical skills are often critical limits.

Artificial intelligence allows for the inclusion of atypical data sources in forecasting models. Sentiment analysis from social media, satellite data processing for real-time economic activity estimates, and the use of large transaction data provide new analytical perspectives. The Bank of Canada, for example, uses the machine to predict inflation at the moment, adding real-time variables that could not have been processed using the old methods (Ajit, 2023).

Artificial intelligence is changing how banks are monitored, mostly in risk detection and analysis. Machine learning finds difficult risk patterns in banking quickly. He also notices strange things that people may not see.

The ability to handle many items at once and find complex links is a real gain for bank monitoring.

The ECB's experience, with more than “40” observed use cases of generative AI in stewardship, shows a range of possible applications. These include automating regulatory compliance analysis, automatically generating supervisory reports, finding market manipulation, and improving the allocation of supervisory resources (McCaul, 2024). These applications and algorithms can improve efficiency and performance and reduce errors in key steps in the process.

Artificial intelligence offers a third key advantage: it can enhance operation. Reports from empirical studies suggest that productivity may increase by about twenty-five percent (25%) when AI is applied correctly. This stems mainly from the ability of artificial intelligence to automate repetitive tasks, work, and accelerate analytics that require great effort, as they are very complex in an easy way and are amenable to analysis and decision-making (McKinsey Global Institute, 2023, pp. 32-48). For central banks, this means the ability to process vast and larger amounts of data and information while dispensing with employment proportionally.

Generative AI provides some special opportunities for central banks to communicate openly. The ability to automatically create analytical summaries, change technology documents into formats that anyone can read, and modify communication for different groups is an added advantage to getting monetary policy right.

5.2 Implications for Algeria:

For Algeria, the central bank's move to adopt AI coincides with economic changes. This creates and grants opportunities and risks associated with its status as a growing or emerging economy. The study points to three main areas: the need for appropriate regulations and regulations, direct investment in infrastructure, and an assessment of international cooperation and its importance.

For responsible and successful adoption of AI, it is important to have an appropriate organizational structure. The European Artificial Intelligence Act, passed in May 2024, provides useful examples for Algeria (European Parliament & Council of the European Union, 2024). This European approach uses a risk-based system, classifying AI applications based on prospective and potential harms with appropriate governance and transparency standards.

For Algeria, applying these concepts requires a great balance between caution, prudence and innovation. Rules should enhance control testing, but also establish safety measures for important uses. This could

build on regulatory protections already tried in other new legal systems, which allow groups to test AI innovations in a controlled area.

Direct investments in technological infrastructure present challenges and opportunities to modernize legacy and existing systems. It requires AI capabilities, especially deep learning, which may not normally be available locally. However, the advent of cloud solutions and the gradual decline of technology costs are expanding availability without excessive and costly expenditures and investments.

Algeria's plan for its infrastructure may include a combination of building local resources for key areas and using international cloud services when needed for less important tasks. In this way, they can balance the need to control their technology with budget limits and the need to get things done efficiently.

International cooperation has become a key factor for success, especially when national resources for building autonomous AI capabilities are limited. Algeria's participation in his initiative cooperation projects, such as the Innovation Center, can help share technology and good practices with more advanced institutions.

This collaboration may include employee exchange programs with AI-skilled central banks, participation in joint projects to create open-source AI tools, and joining global academic research networks focused on AI in finance. Experimental fields in other growing or developing economies, particularly in Asian countries, suggest that such a collaborative approach could accelerate the adoption of technology.

In Algeria, emphasis should be placed on skills development and continuing education. The global shortage of AI experts disproportionately affects growing or developing economies, creating challenges in retaining or hiring talent. To deal with this, plans could include collaborating with local universities to create focused programs, establishing ongoing training for existing workers, and offering incentives to repatriate Algerian experts trained abroad.

5.3 Strategic Guidance:

Based on our study, we propose four key strategies aimed at improving how the Bank of Algeria, and other central banks in developing economies, adopt AI.

✓ Developing a National Strategy for Artificial Intelligence in the Banking Sector

It is recommended that Algeria develop a complete and comprehensive national strategy to guide the adoption of AI in the banking sector. This plan should be a collaborative effort involving all stakeholders such as the Ministry of Finance, the Central Bank of Algeria, the Bank of Algeria and

other financial regulators. The strategy should include realistic and specific goals, timelines and funding mechanisms. Ensuring that this AI strategy fits into the Algerian government's Vision 2030 plan will keep it aligned with the country's economic development goals.

✓ **AI ethics and strengthening data governance**

The Bank of Algeria should work on an AI governance plan that fits its needs. This plan should contain clear and sound rules for how to deal with data, ways to check if things are fair, and ways to constantly look for caveats and risks. Creating an AI ethics group as part of the board will make sure that the people in charge are keeping a close eye on things.

✓ **Skills Development and Investment in Training**

A detailed training program for employees focusing on AI technology should be initiated. This program should have internships, partnerships with universities, and global teamwork. The plan should address the technical parts of AI, ethics, rules, and related risk management. Working with specialist universities may help develop the necessary skills more quickly.

✓ **Actively Engage with Global AI Collaboration Networks**

Algeria should increase its participation in AI-related global cooperation efforts at central banks, such as the Bank for International Settlements Innovation Center and regional central bank forums. This engagement can help access global technologies, reduce expenses related to technological expansion, and allow for learning from the past experiences of similar groups.

If put together, these suggestions could help Algeria take advantage of AI opportunities, while reducing risks to developing economies. The proposed incremental approach shows the need to balance new ideas with a stable, changing economy.

6. Conclusion

This study examined how central banks adopt AI using a comparative approach. It paid special attention to what this adoption means for the Bank of Algeria, as it represents the opportunities and difficulties of emerging or developing economies. The results show a mixed view of adoption, with general excitement combined with limited practical use.

This study indicates that central banks, which view artificial intelligence as a major strategic concern and fear. A significant proportion, specifically 88%, now use generative AI, while 47% intend to increase their AI investments more broadly and significantly. However, the transition from the experimental phase to the full operational phase is a very big problem, as only a quarter of these central banks have already integrated AI applications into their daily operations.

When comparing growing or developing economies with advanced economies, we can see that they treat the level of technology very differently to varying degrees. Emerging or developing economies seem poised to invest significant money in new information technology, perhaps because they believe it is a fast way forward to progress and prosperity. However, they do not have strong management systems. Not many have clear AI policies and strategies.

In Algeria, our study shows a good and somewhat comfortable situation, but it is difficult for the central bank to use artificial intelligence. The current technological, information and digital change in the banking and financial sector, supported by the Algerian government's Vision 2030, opens the doors to improving the business environment and data analysis. However, there is still a need to address technical settings, skills development and management standards and systems.

This study builds on recent studies of AI in central banks by providing original insights. It provides a systematic comparison of AI adoption between growing or developing economies and advanced economies, drawing on new and original data.

The study also developed the first comprehensive academic assessment of what central bank AI means in an emerging MENA economy, filling a key gap in existing studies.

The practical implications of this study extend beyond Algeria's borders. Efficient approaches to formulating an AI strategy, improving data stewardship, investing in skills development, and engaging in global partnerships provide a model for other developing countries facing similar issues.

Future studies can explore various avenues. Because AI technology is changing so rapidly, in-depth and robust long-term studies should assess how these external changes affect how central banks operate over time. Additional rigorous and applied scientific studies, such as surveys of practitioner and field workers, would improve and enrich our understanding of AI's successes, failures, and failures. Finally, studies on other new topics can illustrate the contextual elements needed for central banks to successfully adopt AI.

In a nutshell, this paper suggests that AI could dramatically change central banks in growing or developing economies if central banks use robust, prudent, cautious, and collaborative strategic approaches. This involves learning from international examples and adapting to specific national circumstances and contexts.

7. Bibliography:

- **Ajit, D. (2023).** *Machine learning for economics research: When, what and how* (Staff Analytical Note No. 2023-16, 2023). Bank of Canada. <https://doi.org/10.34989/san-2023-16>
- **Araujo, D. K. G., Schmidt, R., Sirello, O., Tissot, B., & Villarreal Zan, R. (2025).** *Governance and implementation of artificial intelligence in central banks: 2024 survey conducted by the Irving Fisher Committee on Central Bank Statistics* (IFC Report No. 18). Bank for International Settlements. https://www.bis.org/ifc/publ/ifc_report_18.htm
- **Banque Centrale Européenne. (2024).** *European Central Bank sees supervisory boost from generative AI*. Thomson Reuters Regulatory Intelligence. <https://www.thomsonreuters.com/en-us/posts/investigation-fraud-and-risk/ecb-supervisory-boost-gen-ai/>
- **Bank for International Settlements. (2025).** *The use of artificial intelligence for policy purposes* (Report submitted to the G20 Finance Ministers and Central Bank Governors, pp. 4-10). <https://www.bis.org/publ/othp100.pdf>
- **Bank for International Settlements. (2024).** *Artificial intelligence and the economy: Implications for central banks*. BIS Annual Economic Report 2024 (Chapter III, pp. 114-150). <https://www.bis.org/publ/arpdf/ar2024e3.htm>
- **Bank of Algeria. (2024).** Regulation No. 24-04 of October 13, 2024, establishing the legal framework for digital banks, October

- 13, 2024, pp 1-4. https://www.bank-of-algeria.dz/stoodroa/2024/11/REG.24-04.FR_.pdf
- **Bank of Algeria. (2025).** *2024 Annual Report: On the economic and monetary development of Algeria (2025, June Edition).* <https://www.bank-of-algeria.dz/stoodroa/2025/09/Rapport-2024-fr.pdf>
 - **Barajas, A., Beck, T., Belhaj, M., & Ben Naceur, S. (2020).** *Financial Inclusion: What Have We Learned So Far? What Do We Have to Learn?* (IMF Working Paper No. 20/157, pp. 1-40). International Monetary Fund. <https://www.imf.org/-/media/files/publications/wp/2020/english/wpiea2020157-print-pdf.pdf>
 - **Ben Amor, Y. (2024).** Closing the AI Gap between High-Income Countries and Emerging Economies. FII Institute & the Center for Sustainable Development at the Climate School, Columbia University (Report 1. pp. 1-8). <https://fii-institute.org/publication/artificial-intelligence-the-future-of-work/> <https://www.developmentaid.org/api/frontend/cms/file/2025/06/AI-Future-of-Work-Columbia-University-Report1-Final-2.pdf>
 - **Bencheikh, T., Guemoula, B. (2024).** Towards Activating the Policy of Economic Diversification in Algeria. *European Economic Letters (EEL)*, 14(3), 1342–1351. <https://doi.org/10.52783/eel.v14i3.1897>
 - **Brousse, C., Fliche, O., Joyez, J., & Uri, J. (2024).** Les enjeux de l'intelligence artificielle pour le système financier. *Banque de France Revue de la Stabilité Financière*, juin 2024, pp. 70-82. <https://www.banque-france.fr/system/files/2024-06/RSF%20Juin%202024.pdf>
 - **Dunn, W., Meade, E., Nitish, R S., & Kabir, R. (2024).** "Using Generative AI Models to Understand FOMC Monetary Policy Discussions," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, December 06, 2024, <https://doi.org/10.17016/2380-7172.3678>.
 - **European Parliament & Council of the European Union. (2024).** Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). *Official Journal of the European Union*, L, 2024/1689.
 - **Financial Stability Board. (2024).** *The financial stability implications of artificial intelligence* (FSB Report, pp. 13-28).

<https://www.fsb.org/2024/11/the-financial-stability-implications-of-artificial-intelligence/>

- **Gambacorta, L., Kharroubi, E., Mehrotra, A., & Oliviero, T. (2025).** Artificial intelligence and growth in advanced and emerging economies: short-run impact (BIS Working Papers No. 1321, pp. 3-9). <https://www.bis.org/publ/work1321.pdf>
- **Georgieva, S. (2023).** Application of artificial intelligence and machine learning in the conduct of monetary policy by central banks. *Economic Studies*, Bulgarian Academy of Sciences - Economic Research Institute, issue 8, pages 177-199. https://www.iki.bas.bg/Journals/EconomicStudies/2023/2023-8/10_Sonya-Georgieva.pdf
- **Kaidi, T., Merabet, S.A. (2025)** *Numérisation et intelligence artificielle : L'Algérie trace sa voie*. Article dans le journal El Moudjahid le 29/08/2025, rubrique actualité. <https://www.elmoudjahid.com/fr/actualite/numerisation-et-intelligence-artificielle-l-algerie-trace-sa-voie-239509>
- **Macklem, T. (2024).** *L'intelligence artificielle, l'économie et les banques centrales*, Discours de Mr Tiff Macklem Gouverneur de la Banque du Canada Conférence Economics of Artificial Intelligence du National Bureau of Economic Research 20 septembre 2024 Toronto (Ontario). <https://www.banqueducanada.ca/wp-content/uploads/2024/09/discours-2024-09-20.pdf>
- **McCaul, E. (2024).** *From data to decisions: AI and supervision*, Interview Elizabeth McCaul, Member of the Supervisory Board of the ECB, for Revue Banque, European central bank. <https://www.bankingsupervision.europa.eu/press/interviews/date/2024/html/ssm.in240226~c6f7fc9251.en.html>
- **McKinsey Global Institute. (2023).** *The economic potential of generative AI: The next productivity frontier* (Report, pp. 32-48). <https://www.banqueducanada.ca/wp-content/uploads/2024/09/discours-2024-09-20.pdf>
- **Santosdiaz, R. (2025).** *From oil to algorithms: Algeria's fintech path in 2024*. The Fintech Times. <https://thefintechtimes.com/fintech-overview-of-algeria-in-2024/>
- **U.S. International Trade Administration. (2024).** *Algeria - Digital Economy. Country Commercial Guides.*

- <https://www.trade.gov/country-commercial-guides/algeria-digital-economy>
- **Yin, R. K. (2018).** *Case study research and applications: Design and methods* (6th ed., pp. 25-50). Sage Publications. https://opac.atmaluhur.ac.id/uploaded_files/temporary/DigitalCollection/YTE3NDlmYTY0ZjE2MDA5ODE4NGI1Y2FhMjdkMjRmYWVNkMDA2MTVhOQ==.pdf