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Central Banks in the Age of Artificial Intelligence

Is AI Threatening The Future of Monetary Policy?

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Key points

- **AI offers Central banks innovative tools to improve the monitoring of economic activities.**
- **AI could enhance the credibility of monetary policy, increasing Central banks' ability to shape market expectations.**
- **AI generates faster and more flexible price adjustments, potentially amplifying their impact on inflation and complicating monetary policy conduct.**
- **Monetary policy in AI age needs good practices in supervision and a well-thought-out cyber testing framework by central bank and banking sector.**

1. Introduction

Artificial intelligence (AI) is gradually reshaping the future of central banking practices in the digital era. The specific applications and implementations of AI technologies in central banking functions may pose a real threat to the monetary authority's independence by creating technological dependencies on new corporate entities. "The shift from sovereign policy execution to hybrid public-private governance models challenges traditional notions of autonomy, as central banks become structurally entwined with external AI providers" (Koroye and Alaekwe, 2025).

AI impact was especially felt on several levels, such as monetary policy, financial supervision, statistical production, payment system, credit assessment and lending, insurance, cyber security, and asset management. But for this note, we chose to focus our analysis on monetary policy in the AI age.

AI has the potential to offer central banks several opportunities to improve the efficiency and effectiveness of their monetary policies. However, these promising

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opportunities are accompanied by certain risks and uncertainties, which are even more difficult to identify, and can damage the credibility of monetary policy.

Several important questions, however, remain unresolved regarding the integration of AI into monetary policy:

What potential challenges or threats could AI create for monetary policy transmission, credibility, and governance? How can central banks capitalize on AI as a tool to strengthen monetary policy design and implementation? Under what conditions could AI undermine monetary policy effectiveness? What policy frameworks should central banks develop to contain the risks posed by AI while maximizing its contribution to monetary policy effectiveness?

This brief is structured as follows. Section 2 discusses how monetary policy can take advantage of opportunities offered by AI. Section 3 will highlight how the adoption of AI poses threats to the conduct of monetary policy. In Section 4, we propose some conclusions and recommendations that central banks and supervisors could implement to mitigate the risks and threats associated with AI while leveraging its potential to enhance the effectiveness of monetary policy.

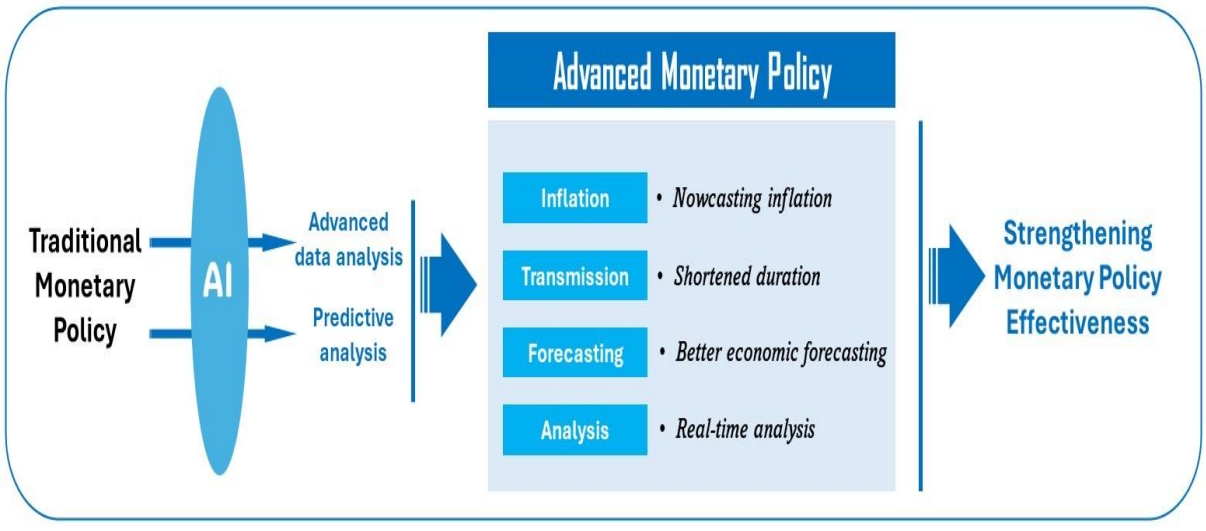
2. AI offers opportunities to improve the efficiency of monetary policy

AI has significantly transformed the traditional approach of central banks towards an advanced monetary policy (Box 1).

A more accurate for nowcasting consumer price inflation

Central banks increasingly use sophisticated techniques such as *Large Language Models* (LLMs) for data classification – a class of generative AI that can analyze and produce text by mimicking human intelligence (Araujo et al, 2024 and 2026) - and *Web Scraping* (WS) for data collection – an automated process used to extract large amounts of data from websites - promoting real-time analyses that offer to monetary authorities the opportunity for nowcasting inflation and making policy decisions more reactive with the underlying current economic and financial environment. As a result, AI increases the efficiency and effectiveness of central bank operations.

Box 1. ***AI is Transforming Central Banks' Approach to Monetary Policy***



Source: *The author*

Shortened the estimated duration of monetary policy transmission

The AI-driven pricing system allows prices to adjust more rapidly and flexibly. In this area, the most digitalized firms may adjust their prices more frequently in response to shocks faster than other firms.

Higher price flexibility—typical of highly digitalized firms that rely on algorithmic pricing —should accelerate and amplify the transmission of monetary policy, shorten the estimated duration of this transmission (Hartmann and Maver, 2025), and thereby reinforce the effectiveness of monetary policy.

At the core of the financial sector, AI has the potential to accelerate disintermediation further. *Non-bank financial institutions* (NBFIs) typically transmit monetary policy impulses to credit rates faster and more intensely than traditional banks. By reducing search costs, eliminating intermediary fees and commissions, and fostering greater competition, AI can enhance and speed up the transmission of monetary policy.

A better economic forecasting

Suffering from the so-called 'curse of dimensionality', conventional forecasting models - referring to the phenomena that occur when high-dimensional spaces are very sparse - were proving to be ineffective to combine the mixed data frequencies.

Natural Language Processing (NLP) and *Large Language Models* (LLMs) - closely related AI technologies - provide central banks with innovative tools for extracting insights and analyzing survey responses (BIS, 2024; Deutsche Bundesbank, 2025; Lenzu, 2026).

By analyzing diverse data sets (national, regional, sectorial, local authorities, international institutions, satellite imagery, social media contents, …), providing real-time assessments of key economic and financial indicators, detecting supply chain bottlenecks in real time, … (Zhang, 2025), AI reinforces the efficiency of monetary policy by making central banks' expectations clear and achievable.

In view of the rise in all forms of uncertainties and risks associated with the economic and financial environment, the significant challenge for central banks remains the use of *Machine learning* algorithms to efficiently extract information from a wide range of sources, including traditional and non-traditional data sources (Araujo et al, 2024). As a result, AI offers central banks a clearer understanding of economic dynamics (Hartmann and Maver, 2025), thereby strengthening the effectiveness of their monetary policy.

3. Some risks and uncertainties facing monetary policy conduct

While AI is often helpful, it can pose significant threats that can compromise the effectiveness of monetary policy in the digital era (Box 2).

An inflation risk that becomes more challenging to predict and to manage

AI also has a shared responsibility for inflation pressures. On the one hand, the AI investment boom should keep inflation persistently above targets, given the significant increase in allocations for AI-related schemes, coupled with the large-scale construction of data centers, which drives up demand for energy and semiconductors. At the global level, data center electricity consumption has expanded by roughly 12% every year since 2017, growing more than four times faster than overall electricity demand (IEA, 2025). On the other hand, faster and more flexible adjustments generated by AI-driven algorithmic pricing became a significant amplifier of price instability, making inflation more challenging for monetary authorities,

driving up interest rates and penalizing economic growth (Aldasoro et al., 2025).

A poorly anchored inflation expectation

It is certain that integrating AI into the analysis of central banks' communications allows them to improve their communication strategies. But this creates a significant challenge that could harm central banks' communication. Relying excessively on AI analyses could limit diversity in market opinions, generating an unexpected market reaction which, in turn, could worsen the quality of central banks' communication and, therefore, make monetary authorities unable to influence market expectations and more specifically inflation expectations.

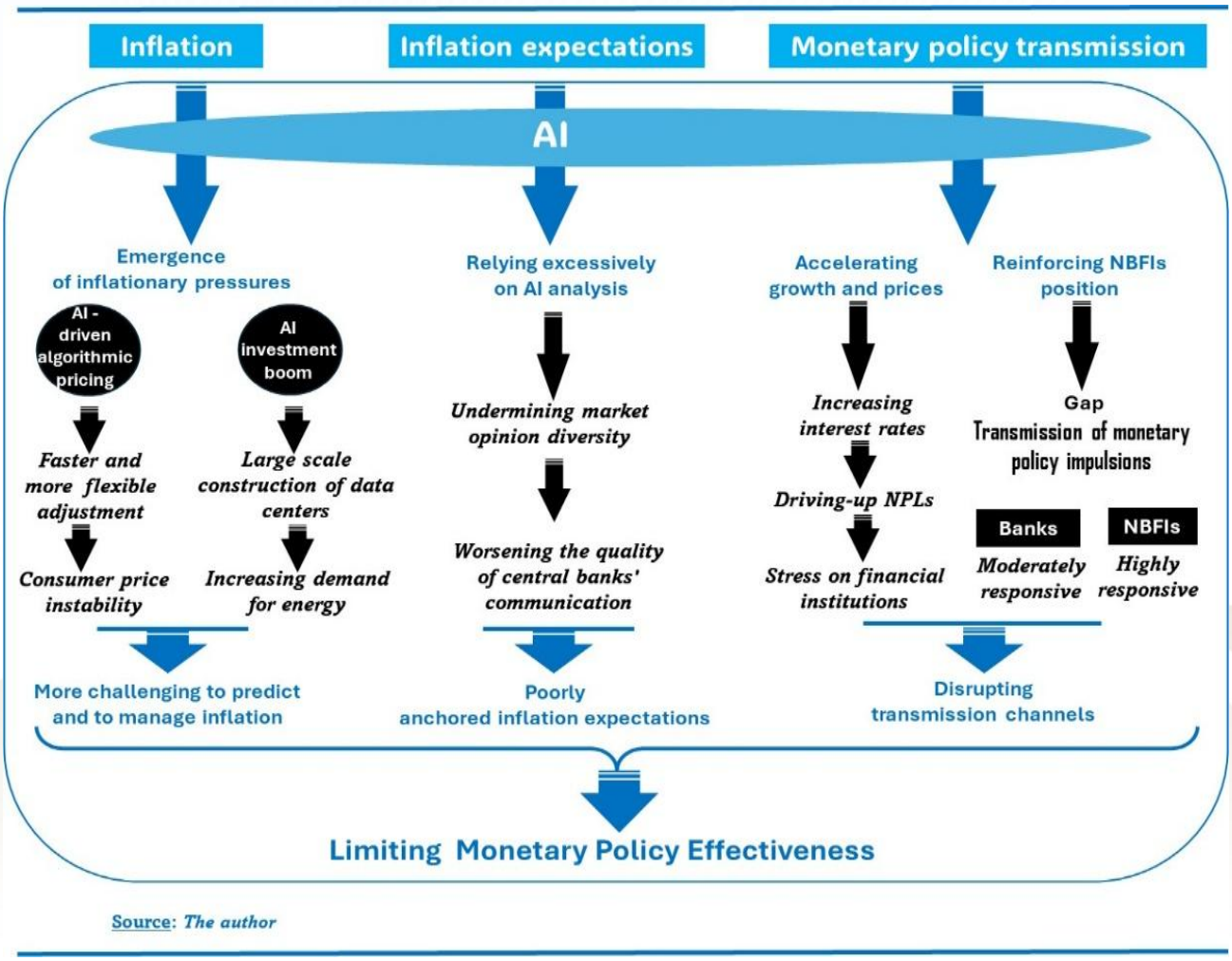
This has been further complicated by the fact that both central bank and market participants were increasingly relying on AI.

Dreaded disruptions to the monetary policy transmission channels

AI has the potential to significantly disrupt monetary policy effectiveness through two key channels: accelerating growth and prices, and reinforcing NBFIs position.

On one side, AI is accelerating growth and prices, leading central banks to increase interest rates significantly and thereby driving-up levels of non-performing loans levels. This deterioration in credit quality erodes banking sector profitability and generates potential stress on financial institutions' balance sheets, disrupting transmission channels and limiting monetary policy effectiveness and efficiency.

Box 2. ***AI and the risk of undermining Monetary Policy Effectiveness***



Source: *The author*

On the other side, AI plays a crucial role in reinforcing NBFIs position in the funding market given their specificities (flexibility and innovation, long-term financing capacity, market-based intermediation, more responsive to monetary policy measures, …).

In recent years, *non-bank financial institutions* (NBFIs) have become important providers of financial intermediation services, with their assets growing faster, attracting greater attention from regulators around the world. Given the digital gap between traditional banking models and NBFIs, and the highly responsive to monetary policy impulsions observed among NBFIs, AI seems to favor the less regulated financial institutions (NBFIs) which could disrupt monetary policy transmission channels and limit monetary policy effectiveness.

4. Conclusion and recommendations

Many central banks in the Global South still lack the capacity to monitor AI risks because they are limited by inadequate IT infrastructure, a lack of granular data, and large skills gaps, which greatly hamper their ability to address challenges such as control of inflation, cybersecurity, guidance for market expectations, data privacy, …

As AI becomes increasingly embedded in the banking sector and business operations, monetary policy responses must be tailored to country and sectoral circumstances.

Monetary policy in AI age needs good practice in supervision and a well-thought-out cyber testing framework by central bank and banking sector.

As we previously mentioned, AI may imply risks extremely damaging to monetary policy effectiveness, but the opportunities that it creates could easily offset these threats if AI implementation is well coordinated and its financial supervision framework is robust.

Monetary policy couldn't be more efficient and effective without proper data quality and a security framework, a consistent and sustained investment in skills and talent, a tailored regulation for new actors such as NBFIs, a close cooperation with other central banks, regulators, and international financial institutions, a developed cyber testing frameworks and building capacity and expertise of cyber risk supervisors.

The following key recommendations are put forward to strengthen central banks' efforts to address the systemic threats generated by AI implementation and take advantage of AI to meaningfully improve monetary policy effectiveness.

- **Building the future of central banks by investing more in human resources and technology.** AI should be considered as complementing human intelligence and not a replacement. The use of AI "could require additional staff training and audits, as laws worldwide move towards enshrining explainability and accountability standards" (Central banking, 2025). Considering risks and opportunities related to AI adoption, central bank modernization has become crucial to meet the growing demands of their mandates and to strengthen their capacity to face a structural transformation affecting monetary policy transmission, financial stability, banking supervision, payments, cybersecurity, labor markets, and data governance.

- **Integrate AI into monetary policy analysis**. To enhance both the forecasting accuracy and better understanding of non-linear economic dynamics, and improve the identification of supply shocks and turning points in economic cycles, central banks should (i) implement AI models for nowcasting inflation, growth, and labor markets using high-frequency data; (ii) combine AI with structural macroeconomic models; and (iii) incorporate *Machine learning* with *Dynamic stochastic general equilibrium* (DSGE) and other structural models.

- **Closing data Infrastructure gaps to enhance systemic risk measurement.** Central banks will not be able to take advantage of IA if data scarcity remains the major structural constraint in the region. Closing data Infrastructure gaps requires: (i) to implement centralized financial data platforms, (ii) to digitize credit registry databases by incorporating non-traditional data - such as utility payments, e-commerce transactions and telecom billing history – to assess "thin-file" and informal sector borrowers, (iii) to encourage data sharing between ministries and financial regulators by using *Memoranda of Understanding* (MOUs) to implement Data-Sharing Agreements and develop a *Shared Digital Infrastructure*, and (iv) to enhance price statistics and labor market data quality.

- **Reinforce cybersecurity and operational resilience to neutralize AI-driven cyber-attack capabilities.** AI significantly enhances the sophistication of cyberattacks, posing risks to financial stability and potentially impairing monetary policy transmission mechanisms. Central banks should: (i) institutionalize comprehensive and forward-looking cyber stress-testing frameworks to properly assess the cybersecurity gaps and the banking sector's operational resilience; (ii) deploy AI-based cyber threat intelligence centers; and (iii) reinforce oversight of cloud service dependencies

- **Enhancing the quality of human capital to better anchor it the culture of performance and innovation.** Central banks should commit to continually enhancing the quality of human resources dedicated to the new professions related to AI development, maintenance, and application. Such a commitment is crucial and requires the adoption of an innovative approach of human resources management based on: (i) recruiting data scientists and AI engineers; (ii) retraining and upskilling existing staff in computational economics; and (iii) establishing AI training academies within each central bank.

- **Reshaping the landscape of the banking sector with generative AI.** Monetary policy effectiveness requires the introduction of AI governance standards for the financial sector, given the privileged place of the credit channel in the transmission of monetary policy in the countries of the region. Central banks should establish binding supervisory standards requiring algorithmic transparency, robust bias-mitigation mechanisms, independent third-party model validation, and comprehensive AI risk disclosure, while fully integrating AI model risk into prudential stress-testing and supervisory risk-assessment frameworks.

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The Arab Planning Institute - Kuwait

In 1966, the Government of the State of Kuwait, in collaboration with the United Nations Development Programme (UNDP), established the “Kuwait Institute for Economic and Social Planning in the Middle East” as an independent Kuwaiti institution. This initiative was launched in accordance with the agreement concluded at the time between the Government of Kuwait and the UNDP, covering the first five years of the institute’s inception.

Upon the conclusion of that initial period, and in response to the request of the Government of Kuwait, along with several other Arab governments—motivated by their belief in the vital role of planning in achieving Arab economic and social development, and their commitment to strengthening ties, unifying efforts, and enhancing Arab development cooperation—procedures were initiated in 1972 to transform the institute into an independent Arab institution under the name “The Arab Planning Institute in Kuwait”. During this transitional phase, the United Nations continued its support for an additional five years by providing number of international experts and a series of training scholarships.

Between 1978 and 1980, the founding and acceding Arab states formally approved the agreement establishing the Arab Planning Institute (API). It was thereby recognized as an independent, non-profit Arab institution whose principal mission is to support the development efforts of Arab countries through the preparation of consultancy studies and research, conducting capacity-building programs, provision of institutional support, organization of development-focused conferences, and publication of specialized development literature.

المعهد العربي للتخطيط بالكويت

أنشـأت حكومة دولة الكويت عام 1966 بالتعاون مع برنامج الأمم المتحدة الإنمائي "معهد الكويت للتخطيط الاقتصادي والاجتماعي في الشرق الأوسط" كمؤسسة كويتية مستقلة؛ وذلك وفقًا للاتفاقية التي عُقدت آنذاك بين حكومة دولة الكويت وبرنامج الأمم المتحدة الإنمائي خلال السنوات الخمس الأولى من إنشائه.

وبانتهاء تلك الفترة، وبناءً على رغبة حكومة دولة الكويت وعدد من الحكومات العربية، إيماناً منها بأهمية التخطيط لتحقيق التنمية الاقتصادية والاجتماعية العربية، وحرصاً على توطيد الروابط وتضافر الجهود والتعاون الإنمائي العربي، بدأت في عام 1972 إجراءات تحويل المعهد إلى مؤسسة عربية مستقلة باسم "المعهد العربي للتخطيط بالكويت"، واستمر دور الأمم المتحدة في تلك الفترة بالمساهمة لمدة خمس سنوات أخرى بتوفير عدد من الخبراء الدوليين، إضافة لعدد من المنح التدريبية.

وتوالت خلال الفترة من عام 1978 إلى عام 1980 موافقات الدول العربية المؤسِّسة والمنضمَّة على اتفاقية إنشاء "المعهد العربي للتخطيط بالكويت"، وتم إقراره كمؤسسة عربية مستقلة لا تهدف للربح، ومهمته الرئيسية هي دعم المسيرة التنموية في الدول العربية من خلال إعداد الدراسات الاستشارية والبحثية، عقد برامج بناء وتنمية القدرات، تقديم الدعم المؤسسي، تنظيم اللقاءات التنموية، وإصدار المنشورات الإنمائية المتخصصة.

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