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THE IMPLICATIONS OF AI FOR MONETARY POLICY: A FIRST ASSESSMENT

by Lucia Esposito*, Elisa Guglielminetti*, Elia Moracci*, Andrea Papetti* and Massimiliano Pisani*

Abstract

This paper assesses the impact of artificial intelligence (AI) on monetary policy transmission and on central banks' reaction functions. By speeding up routine and repetitive tasks through automation and accelerating the incorporation of incoming information into decision-making, AI may affect productivity, market structure and broader macroeconomic developments. AI may also increase macro-financial complexity and systemic vulnerabilities by amplifying interconnectedness, heightening operational and cyber risks, and reinforcing procyclical and herding dynamics in an environment characterized by faster and partly algorithmic decision-making. Central banks' reaction functions will need to adapt to a setting marked by a different transmission mechanism, new uncertainty surrounding the natural rate of interest and tail risks. At the same time, AI could enhance the effectiveness of monetary policy by improving assessments of the macroeconomic outlook and the distribution of risks around it, as well as by strengthening monetary policy communication and the management of expectations.

JEL Classification: O33, E44, E32, E31, E52.

Keywords: artificial intelligence, credit markets, financial markets, inflation, business cycle, monetary policy.

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1. Introduction

Artificial intelligence (AI) refers to a set of machine-based technologies that enable prediction, optimization, and autonomous decision-making.[1] Recent advances – most notably in large language models and, more recently, in agentic systems capable of autonomous reasoning without direct human supervision – have substantially expanded the scope of AI applications. As a result, AI increasingly displays the defining features of a *general-purpose technology* and, potentially, of an "invention in the method of invention", with the capacity to raise not only the level of productivity but also its growth rate over time to an expanding frontier characterized by "Artificial General Intelligence" that goes beyond the current narrow AI systems (Aldasoro *et al.*, 2025; Baily *et al.*, 2026).[2]

AI affects the economy by raising efficiency and potential output. From a microeconomic perspective, AI favours efficiency gains, by speeding-up routine and repetitive tasks through automation, making knowledge-based work more effective in generating new ideas, enlarging the information set available to firms, households, financial intermediaries, and policymakers, affecting expectations formation and risk assessment, and accelerating the incorporation of new information into economic decisions, which become more accurate and faster. Thus, there could be implications for the speed and pattern of price and quantity adjustments at market level. From a macroeconomic perspective, AI expands the production technology frontier (i.e., the potential output) of the economy, with implications for overall factor demand and economic activity. Taken together, these effects reshape the economic environment in which monetary policy (MP) operates.

However, AI may increase systemic vulnerabilities by amplifying macro-financial interconnectedness, increasing operational and cyber risks, and reinforcing procyclical and herding

[1] Lucia Esposito: lucia.esposito@bancaditalia.it; Elisa Guglielminetti: elisa.guglielminetti@bancaditalia.it; Elia Moracci: elia.moracci@bancaditalia.it; Andrea Papetti: andrea.papetti@bancaditalia.it; Massimiliano Pisani: massimiliano.pisani@bancaditalia.it. We thank Giuseppe Ferrero, Alessandro Notarpietro, Stefano Neri, Fabrizio Venditti, Fabio Busetti, Alessandro Secchi, and Roberta Zizza for useful comments. All errors are ours. The views expressed in the paper do not necessarily represent those of Banca d'Italia.

[2] The notion of AI exists at least since the 1956 research project by the Dartmouth College Prof. J. McCarthy aimed at making machines use language and solve problems generally reserved for humans, improving themselves. According to the OECD (2024), "*an AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment*." In this paper, we use the term AI in a broad sense, to refer to the set of technological possibilities that can emerge since the appearance of "Generative AI" after years of advances in large language models (LLMs), particularly since late 2022 with the diffusion of ChatGPT, and since the appearance in 2024 of the so-called "Agentic AI", characterized by autonomous reasoning and decision-making without human supervision.

dynamics, in a context of faster and in part algorithmic decision making. As a result, crises could materialize more rapidly, propagate more broadly, and have stronger spillovers to the real economy.

AI may therefore have multiple implications for MP. A wide diffusion of AI will affect potential output, inflation dynamics and the natural rate of interest, as well as alter the strength and speed of the MP transmission to prices and economic activity through the market for liquidity and through credit and financial markets. Moreover, AI could affect the central bank's reaction function. Finally, MP should take into account the new tail risks arising from AI and their potential effects on real GDP growth, inflation, and financial stability.

In this paper, we assess the implications of AI for MP strategy. To this purpose, we initially assess AI's possible effects on supply and demand forces in the market for liquidity, in credit and financial markets, as well as in the economy (both inflation and economic activity) and in labour market at large. In particular, we first describe how these markets would differ in an AI-intensive economy with respect to the pre-AI economy; then, we focus on the transmission of MP in the AI-intensive economy; finally, we evaluate the implications of AI for the reaction function of the central bank (taking into account the impact of AI on the ability of the central bank to assess the economic and inflation outlook, as well as the impact of AI on the MP transmission and the natural rate of interest r^*).[3] Our evaluation is subject to substantial uncertainty and remains partly speculative, reflecting the intrinsic difficulty of analysing the macroeconomic implications of AI and the still limited and recent nature of the related literature.

The key messages of the analysis are the following.

- **AI can induce a leftward shift in the demand for central bank reserves and make it steeper, thanks to banks' improved forecasting capabilities of liquidity needs in normal times**. Demand for reserves will be flatter in cases of liquidity stress, which could materialize more quickly and become more severe because of AI. Thus, the central bank operational framework should be flexible enough to accommodate lower reserve demand in normal times while preserving sufficient resilience to absorb sudden liquidity shocks and safeguard the effective transmission of MP.
- **AI will likely dampen MP transmission through credit markets; the speed of transmission may however increase**. In particular, MP shocks are likely to produce smaller shifts to the loan supply curve in the AI-intensive economy due to a weaker 'financial accelerator' mechanism

[3] We focus on standard MP measures. We leave the analysis of the impact of AI on non-standard measures for future research. Moreover, our analysis is about the comparison of the pre-AI economy and the AI-intensive economy. Thus, we do not assess the transition between the two economies.

and, in turn, a weaker overall response of credit volumes to MP rate changes. At the same time, AI-driven efficiency gains are expected to support financial and credit markets' liquidity and faster reaction to MP in normal times. Moreover, MP could face an AI-induced increase in the risks to financial stability.

- **In the AI-intensive economy, inflation could become more reactive to shocks**. The faster response of credit and financial markets to MP impulses and the higher price flexibility could imply a swifter transmission to inflation.
- **Overall, AI presents both opportunities and challenges for central banks**. While a more responsive environment could make macroeconomic stabilization more challenging for central banks, AI could also help monetary authorities improve forecasting, refine estimates of key indicators and of the strength of MP transmission, and enhance communication of policy decisions to the public.

The paper is organized as follows. Section 2, 3, and 4 illustrate the implications of AI for, respectively, liquidity and money markets, credit and financial markets, and macroeconomy (both inflation and economic activity), with a focus on the effects on the transmission of MP through these markets. Section 5 evaluates how AI could affect the reaction function of the central bank. Section 6 concludes.[4]

2. Liquidity and money markets

AI can induce a leftward shift in the demand for central bank reserves and make it steeper, thanks to improved forecasting capabilities of liquidity needs in normal times. Demand will be flatter in cases of liquidity stress, which could materialize more quickly and become more severe because of AI. Thus, the central bank needs a robust and flexible operational framework to accommodate potentially lower reserve demand in normal times while preserving sufficient resilience to absorb sudden liquidity shocks and safeguard the effective transmission of MP.

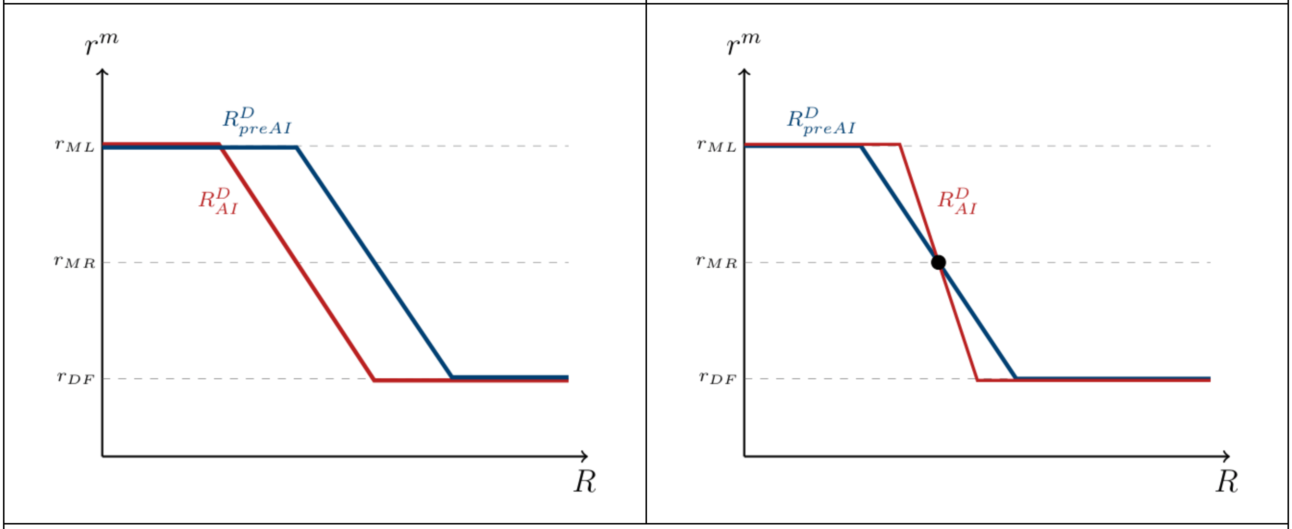
AI can induce a leftward shift in the demand for central bank reserves (Figure 1, left panel). The banks' reserve demand function is the schedule of interest rates at which they are willing to hold different quantities of reserves (Bindseil, 2014). This function is shaped by a range of structural and institutional factors that influence both its position and slope, including reserve requirements, precautionary liquidity needs, the regulatory framework, market frictions and volatility, and developments in payment systems. AI is expected to affect several of these determinants.

[4] See Hartmann and Maver (2025) and Lenzu (2026) for other conceptual discussions about how the spreading of AI in the economy may affect MP transmission.

- By increasing potential output and overall economic activity, AI could expand outstanding deposits, thereby exerting upward pressure on the reserve base. At the same time, greater efficiency in liquidity allocation and portfolio management may enable banks to reallocate funds currently held in liquid instruments within the reserve base toward other assets, reducing banks' structural demand for central bank reserves.
- With regard to precautionary motives, AI-enabled improvements in data processing and forecasting may reduce the need for banks to hold large precautionary buffers of excess reserves under normal conditions characterized by limited liquidity shocks. At the same time, more accurate and timely liquidity forecasts would allow banks to anticipate large outflows more effectively and to accumulate precautionary buffers in a more gradual and targeted manner when needed, particularly during periods of financial stress.[5] The forces reducing reserve demand are likely to dominate, as precautionary demand accounts for a large share of overall reserve demand – particularly in an ample-reserves regime – and is also the most elastic component.
- It remains inherently difficult to anticipate the precise contours of the regulatory framework that will prevail in an economy shaped by the widespread adoption of AI. Assessing how AI will ultimately interact with, and potentially reshape, regulatory requirements – particularly in the domain of payment systems – falls beyond the scope of the present analysis and warrants dedicated and more comprehensive future investigation.

Figure 1 – AI and the demand for central bank reserves

(a) Shift	(b) Change in slope



Notes: The figure illustrates how AI could shift and rotate demand for central bank reserves.

[5] This effect, however, may be partially offset by the increased substitutability between central bank reserves and other high-quality liquid assets, as enhanced analytical capabilities and improved market functioning increase banks' ability to mobilize alternative sources of liquidity in a timely and cost-effective manner.

An AI-intensive economy may also steepen the reserve demand curve. Building on the reasoning outlined above, in the AI-economy central bank reserves are likely to play a smaller role as an insurance instrument in normal conditions, while becoming comparatively more valuable during periods of liquidity stress. When reserves are perceived as less essential for precautionary purposes, changes in the interest rate induce smaller adjustments in banks' desired reserve holdings, resulting in a steeper demand curve. Conversely, when reserves become more critical as a safeguard against liquidity risk, banks respond more sensitively to interest rate variations, leading to a flatter demand curve (Whitesell, 2006). Accordingly, relative to the pre-AI environment, the reserve demand curve is expected to be steeper in normal times and flatter in periods of financial stress. The latter could materialize more quickly and become more severe because, in some (rare) cases, AI-driven algorithmic trading and rapid decision-making by financial and credit institutions can amplify herd behaviour, strengthen market correlations, and increase the size of abrupt liquidity dislocations, thereby contributing to heightened volatility, liquidity stress, and flash crashes. Figure 1 (right panel) provides a stylized illustration of the steepening of the reserve demand curve under an AI-intensive regime, reflecting a structurally lower elasticity of reserve demand with respect to interest rate changes under normal liquidity conditions.

The widespread adoption of AI implies that the operational framework should be flexible and robust. Faster abrupt and large liquidity outflows imply that reserve demand may become more state-contingent, increasing the value of maintaining an adequate liquidity buffer at the aggregate level. This suggests that the central bank may need to place greater emphasis on the robustness and flexibility of its operational framework[6] to ensure smooth interest rate control during periods of stress. In addition, improvements in liquidity forecasting enabled by AI – both at the level of banks and the central bank – may enhance the central bank's ability to calibrate liquidity provision more precisely. Taken together, these developments point to the need for an operational framework which is capable of accommodating potentially lower reserve demand in normal times while preserving sufficient resilience to absorb sudden liquidity shocks and safeguard the effective transmission of MP.

3. Credit and financial markets

AI could induce a rightward shift in both the supply of and the demand for bank loans, driven by fiercer competition in the banking sector and higher investment needs, respectively. It could also make both schedules more elastic, due to better screening and monitoring (on the supply side) and

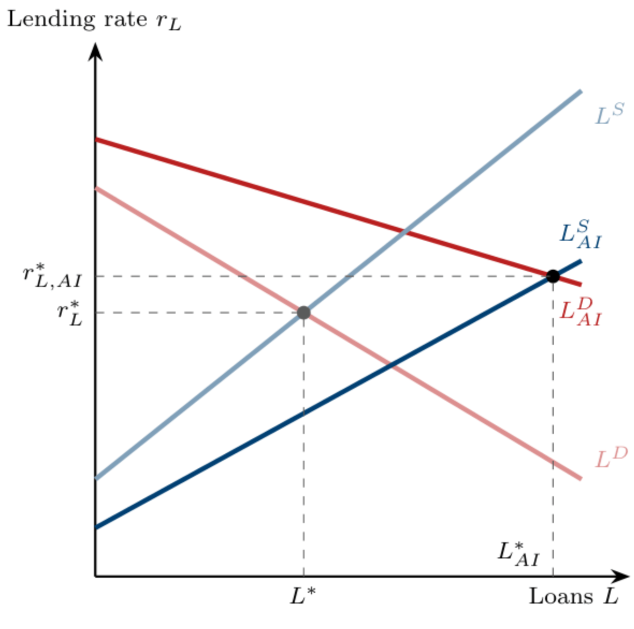
[6] See *Changes to the operational framework for implementing monetary policy* (March 2024, ECB Statement) for an overview of all principles that will guide MP implementation in the future.

reduced search frictions (on the demand side). As a result, credit volumes are likely to increase, whereas the net effect on lending rates is a priori ambiguous. The widespread adoption of AI would affect several channels of MP transmission operating through credit markets, reducing its overall strength. AI could induce larger reactions of financial markets to MP impulses if algorithms' herd behaviour materializes. The speed of MP transmission through credit and financial markets could increase.

3.1 The credit market

AI may increase credit volumes. AI adoption may expand lending through its effects on both the demand and the supply of credit. First, AI could induce a rightward shift of the loan supply curve, through two mechanisms. The potential entry of AI-driven non-banks (e.g., fintech lenders) may increase contestability in credit markets, compressing lending spreads;[7] moreover, AI enhances banks' screening accuracy and their monitoring efficiency, lowering expected default losses.[8] AI may

Figure 2 – AI and credit markets



Notes: The figure illustrates how AI could affect the equilibrium in credit markets by shifting and rotating credit demand and loan supply schedules.

[7] Our baseline hypothesis is that competition in the banking sector may rise as AI reduces operational costs and facilitates entry, enabling smaller intermediaries to operate profitably. However, it may well be that AI reinforces "winner-takes-all" dynamics, reducing competition. For instance, if predictive performance improves with the scale of proprietary data, large banks may accumulate informational advantages that smaller intermediaries cannot replicate. Superior model accuracy would allow incumbents to increase their market share. Such data-driven increasing returns could lead to market concentration even in the presence of initially lower technological entry barriers.

[8] These expansionary forces could be partially offset by tighter regulatory requirements introduced in response to new AI-related risks. Higher capital buffers aimed at mitigating operational risks – such as data quality problems, model opacity, or biases embedded in training algorithms – would increase banks' effective marginal cost of lending, thereby tempering the expansion of credit supply.

also increase the elasticity of credit supply: more precise risk assessment mitigates the deterioration in portfolio quality as lending expands, reducing the rate at which marginal cost increases with loan volumes.[9] The rightward shift and change in the slope of the loan supply schedule are visualized in Figure 2.

AI may also affect the loan demand schedule. Improved cash-flow forecasting and working-capital management may reduce firms' reliance on short-term borrowing; however, if AI adoption raises productivity and strengthens expected growth, higher expected returns to investment and improved debt-servicing capacity may increase firms' willingness to borrow at a given lending rate. If this growth channel dominates, the loan demand curve shifts rightward. AI may also increase the elasticity of credit demand. Digital comparison tools and lower switching costs between bank and non-bank lenders enhance borrowers' ability to compare offers and reallocate borrowing across providers, implying a flatter demand curve (Figure 2).

AI could dampen the impact of MP on credit supply via the borrower's balance sheet channel. A rise in policy rates generally worsens borrowers' balance sheets by increasing debt-service costs (cash flow channel) and reducing the value of pledged collateral (collateral valuation channel); banks then respond to the implied higher default risk by tightening their lending terms and conditions. AI credit risk models integrate broader and higher-frequency data alongside or in place of conventional historical balance sheet metrics.[10] Because banks equipped with such models can more precisely distinguish between structural changes in default risk (not associated with MP conditions) and cyclical shifts in balance sheet markers driven by monetary conditions, the sensitivity of their perceived credit risk to interest rate changes should be lower. Moreover, AI-driven improvements in monitoring should reduce banks' reliance on collateralized loans. Both factors reduce the response of the *external finance premium* to monetary impulses, attenuating the amplification of MP decisions through lending markets.[11]

Similarly, AI could weaken MP transmission to credit supply through the deposit channel. Banks usually raise deposit rates less than one-for-one in response to a policy rate hike, accepting

[9] Banks can use AI for their credit scoring both in the screening and in the monitoring process (Gambacorta *et al.*, 2025). AI adoption has been found to improve banks' credit scoring (Gambacorta *et al.*, 2024). Del Prete *et al.* (2025) show that banks' use of AI is associated with more credit provision and lower interest rates charged on firms' loans.

[10] Examples include real-time transaction activity, alternative indicators of creditworthiness (e.g., utility and trade-credit payment records, invoice settlement behaviour, and digital sales histories), and non-traditional behavioural variables such as account usage intensity and cash-flow volatility (World Bank, 2024).

[11] Endogenous movements in credit markets that propagate and amplify shocks to the macroeconomy are at the core of models that feature a *financial accelerator*. In particular, the direct effects of MP on interest rates are amplified by endogenous changes in the *external finance premium* generated by shifts in borrowers' net worth. See Bernanke and Gertler (1995) and Bernanke *et al.* (1999) for details.

deposit outflows and, thus, restricting lending.[12] If AI comparison tools become available to depositors, enhancing transparency, or Fintech entry increases competition in the deposit market, banks would likely raise deposit rates to a larger extent after a monetary tightening, resulting in smaller deposit outflows and ultimately in a less pronounced drop in credit supply. Overall, MP transmission to lending volumes through this channel may weaken; at the same time, the response of lending rates may be strengthened if banks want to preserve their margins.

AI may also weaken MP transmission via the bank capital channel. A standard monetary tightening tends to weaken banks' capital positions by generating valuation losses and increasing risk-weighted assets: as capital ratios decline, regulatory constraints become more binding, leading capital-constrained banks to contract lending disproportionately. Conversely, a typical monetary easing strengthens capital positions, relaxing such constraints and supporting credit expansion. AI may attenuate this mechanism by reducing the volatility of capital ratios. More accurate and timely credit risk assessments can limit unexpected losses and smooth adjustments in risk-weighted assets. As capital positions become less sensitive to monetary shocks, regulatory constraints bind less frequently, dampening the contraction of lending during tightening periods and the expansion during easing phases, ultimately weakening MP transmission through this channel.

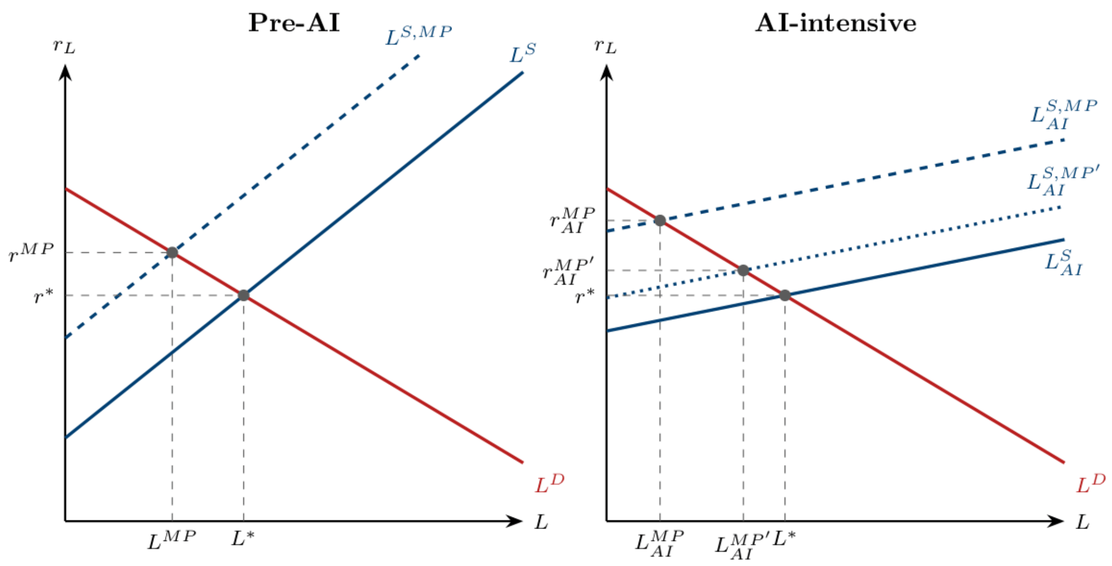
AI's effect on the strength of the transmission to credit supply through the risk-taking channel is ambiguous. In the pre-AI world, a decline in policy rates compresses the returns on safe assets and narrows net interest margins. To sustain profitability, banks may expand lending toward riskier borrowers or longer-maturity assets, thereby increasing the risk profile of their portfolios. AI may modify this mechanism in opposing directions. On the one hand, improved risk measurement and portfolio optimization may dampen the search-for-yield incentives that typically follow a monetary easing, as banks become better able to price and manage credit risk and to balance risk and return, thereby reducing the sensitivity of portfolio risk to monetary conditions. On the other hand, stronger competition in an AI-intensive environment may push banks to take on additional risk in order to preserve profitability, potentially reinforcing the response of portfolio risk to MP changes.[13]

[12] See Drechsler *et al.* (2017) for a thorough description of the *deposit channel* of MP transmission.

[13] AI could also strengthen MP transmission through some channels, that however appear to be of second order importance with respect to those mentioned above. For instance, AI may strengthen the indirect effects of a monetary tightening operating via banks' risk perceptions. When policy rates rise, banks may anticipate that the ensuing aggregate demand contraction will worsen their clients' prospects, thereby tightening their lending terms and conditions even in the absence of an immediate deterioration in observed credit quality. Relationship-based lending has been shown to attenuate this channel, as long-standing bank–firm relationships allow lenders to rely on soft information and to smooth credit provision over the cycle, thereby dampening the transmission of policy rate changes to lending rates and loan volumes (Hachem, 2011; Aksoy *et al.*, 2013; Berger *et al.*, 2024). By increasingly relying on AI-based tools for the assessment of borrower creditworthiness, banks may partially substitute away from relationship lending, thereby weakening this stabilizing mechanism and reinforcing the transmission of MP to credit supply. The findings from Gambacorta *et al.* (2025) suggest that the adoption of AI by banks weakens, to some extent, the effects of relationship lending during crises.

Overall, AI will likely dampen MP transmission through credit markets; the speed of transmission may however increase. Most mechanisms discussed above suggest that AI is likely to attenuate the strength of MP transmission through credit markets. In particular, weaker amplification through the borrower balance-sheet, deposit, and bank capital channels implies that a given monetary tightening would induce a smaller upward shift of the loan supply curve in the AI-intensive economy (Figure 3). At the same time, we argued that AI could make loan supply more elastic. When the supply curve is flatter, a given upward shift (triggered by higher funding costs, tighter capital constraints, or increased perceived risk after a MP tightening) translates into larger movements in lending volumes: a greater elasticity tends to amplify the quantity response to any given shift in supply. Our assessment, however, is that MP shocks are likely to produce smaller shifts to the supply curve in the AI-intensive economy. This would imply a weaker overall response of credit volumes to policy rate changes. Even if the strength of MP transmission via credit markets declines, its speed may increase. The widespread use of automated pricing and credit allocation models could make banks' responses more synchronized, leading to faster adjustments in lending rates and loan volumes following a policy impulse.

Figure 3 – AI and credit markets: transmission of a MP tightening



Notes: The figure compares the impact of a restrictive MP shock on the credit market equilibrium in the pre-AI and AI-intensive economy. To ease the comparison, the demand curve is kept fixed, and the initial equilibrium is the same. We focus on a change in the policy rate that induces an upward shift in the loan supply schedule. In the AI-intensive economy, we consider two cases: (i) a case in which changes in the policy rate induce the same shift to the credit supply curve as in the pre-AI economy; (ii) a case in which changes in the policy rate induce a smaller shift.

3.2 Financial markets

AI-driven efficiency gains are expected to support financial markets' liquidity and faster reaction to MP in normal times. At the same time, AI could raise the risks to financial stability.[14]

AI-driven efficiency gains are expected to support financial markets' liquidity and faster reaction to MP. Existing literature suggests that technologies that improve information processing, price discovery, and trading efficiency tend to enhance market liquidity by reducing information asymmetries, transaction costs, and operational frictions. By facilitating faster execution, better risk assessment, and broader market participation,[15] these technologies support deeper markets (e.g., Foucault *et al.*, 2013) and faster reaction to changes in MP.

AI could raise the risks to financial stability. AI technologies trained on similar data sets may unintentionally produce coordinated recommendations or pricing strategies, mimicking collusion, and undermining competition. Thus, the widespread use of similar algorithms could amplify short-term market movements. If numerous institutions adopt comparable AI models for credit risk, trading or portfolio management, the synchronized responses during (rare) periods of stress could exacerbate procyclicality and trigger large-scale asset sell-offs. A larger share of the (amplified) short-term price movements may not directly correspond to changes in underlying economic fundamentals. Ultimately, the economic and financial system might be on a less stable and resilient footing, as agents increasingly depend on a technology whose limitations, predictions, and cyber vulnerabilities are less well understood and controlled (Cecchetti *et al.*, 2025; Cipollone, 2024; Danielsson and Uthemann, 2025; Wei Dou *et al.*, 2025).

4. The real sector and inflation

AI would increase output growth by boosting productivity, while its effects on wages and employment are uncertain. It could also induce risks to real sector stability. It is uncertain whether inflation will be higher or lower than in the pre-AI economy, but it could be more volatile because of higher price flexibility. The transmission of MP to inflation and aggregate demand could become faster.

AI would increase output growth by boosting productivity, but the quantitative impact is difficult to assess. The literature seems to agree that AI increases labour productivity growth, by fostering both total factor productivity and capital deepening (as well as the share of AI-based sectors). Indeed, AI would speed-up routine and repetitive tasks through automation and make

[14] We abstract from possible macroeconomic effects of a widespread AI adoption that may materialize via financial markets during the transition, e.g., through an upward correction in the valuation of AI companies.

[15] Although gains may concentrate among technologically advanced firms (see Acemoglu and Restrepo, 2020; Brynjolfsson *et al.*, 2021; Bank of International Settlements, 2024).

knowledge-based work more effective in generating new ideas (and, thus, in generating innovations, new products, or new forms of organization).[16] However, the range of estimates for the impact on output growth of advanced economies over the next decade is wide, going from almost a nihil impact based on a purely "task-based" approach that assesses the production cost reduction via labour-saving (Acemoglu, 2025) to a figure of more than 2.5 percentage points per annum when a potential acceleration in innovation is considered (Baily *et al.*, 2023).[17]

While AI could favour long-run economic growth, its effect on wage growth and employment is uncertain. AI's effect on wages will depend on two offsetting factors: the increase in productivity growth and the reduction in the bargaining power of workers threatened by automation. For employment, historical regularity suggests that innovation and productivity growth tend not to reduce aggregate employment. Over the past two hundred years the *displacement effects* (the jobs lost due to changes in technology) have been outweighed by the *countervailing effects* (increases in labour demand arising from these innovations).[18] However, the displacement effects induced by AI could be bigger than in previous episodes of technological change and the countervailing effects may be more muted: AI could shrink the number of non-automated tasks so much that there isn't enough work left for the displaced workers; and if many of the new goods and services are created by AI itself, the labour market may not benefit from increased demand.[19] At the same time, recent evidence suggests that AI could make the labour market more efficient by reducing search and matching frictions and, thus, favouring job creation.[20]

AI could favour risks to real-sector stability. As discussed in previous section, there could be an increase in the (tail) risk to financial stability. This higher risk can generate higher risk to real-sector stability through the traditional credit and financial market channels that affect both demand and supply of consumption and investment goods. Moreover, risks similar to those to financial stability can directly affect the real sector, e.g., price herding behaviour, operational errors, and cyber risk.

[16] See Aghion and Bunel (2024).
[17] For a review, see Filippucci *et al.* (2024). Moreover, if a country is an 'AI-innovator', instead of being an 'AI-adopter', it could also generate a favourable demand shock by increasing investment, e.g., in data centres, along the transition. We do not consider the transition, but its ending point (the AI-intensive economy). For the impact of AI diffusion and adoption see Lane (2026) and Schnabel (2026).
[18] The effects of AI on firms' performance can also be assessed through surveys. According to the latest Banca d'Italia's Survey of Industrial and Service Firms, conducted at the beginning of 2026, among AI-using firms, 70% reported AI having no impact on labor productivity so far, but half of them expected a positive impact over the next three years (Banca d'Italia, 2026). Moreover, 84% of firms indicated no impact of AI on employment, in line with recent cross-country evidence (Yotzov *et al.*, 2026).
[19] See Macklem (2024).
[20] Le Barbanchon *et al.* (2023) provide evidence from a randomized controlled trial that access to a machine-learning job recommender system positively affects employment. See Gopinath (2024) on how the widespread use of AI could turn an ordinary downturn into a deep and prolonged economic crisis by causing large-scale disruptions in labour markets, in financial markets, and in supply chains.

It is uncertain whether the AI-intensive economy will, on average and abstracting from MP, be characterized by higher or lower inflation than the pre-AI economy. On the one hand, by boosting productivity, the diffusion of AI expands aggregate supply, generating disinflationary pressures. In addition, if labour-displacement effects dominate offsetting forces in the labour market, higher unemployment may weaken workers' bargaining power and curb wage growth, further restraining inflation. On the other hand, higher productivity may stimulate aggregate demand. To the extent that productivity gains are at least partially passed through into higher wages and employment, households may increase consumption, while firms may raise investment in response to improved profitability and growth prospects. Moreover, the energy and utility components of inflation could come under upward pressure, given the large energy and water requirements associated with AI production and data-processing activities, unless rising demand is met by sufficiently strong expansions in energy supply and the widespread adoption of energy-saving technologies.

AI could lead to a higher degree of price flexibility and, likely, inflation volatility, as lower menu costs would allow more digitalized companies to adjust their prices more frequently.[21] Competitive pressures would lead to less digitalized companies adjusting their prices in a more flexible way too. Ceteris paribus, the steepness of the goods Phillips curve (i.e., supply-side of the real sector) would increase.[22]

In this AI-intensive economy, the transmission of MP to inflation and economic activity could become faster. Greater price flexibility at the firm level would accelerate the transmission of MP to inflation. Moreover, AI could help households and firms to improve their forecast of future income, reducing the uncertainty. The implied lower precautionary behaviour would favour a quicker response of consumption and investment to MP impulses. AI could also reduce adjustment and installation costs of investment in physical capital. The lower expenses, time, and disruption associated with planning, erecting, and installing new machinery or facilities could make the response of investment quicker. Finally, as discussed in the previous sections, the transmission of MP decisions through credit and financial markets should become faster. Thus, households and firms that rely more on these markets can finance their spending decisions in a quicker way.

[21] See Gorodnichenko and Talavera (2017) for evidence on digitally intensive firms changing prices more frequently than less digitally intensive firms. See also Hartmann and Mader (2025), Lenzu (2026), and Savagar *et al.* (2026).

[22] To the opposite, if AI increases firms' market power and concentration, firms could exploit larger margins to absorb shocks with little or no change in prices.

5. The MP reaction function

We assess the role of AI through the prism of three pillars that typically feature in the reaction function of a central bank such as the ECB: the economic and inflation outlook, the MP transmission, and the equilibrium real interest rate over which the economy is meant to fluctuate (i.e. the natural rate, r^*).[23]

By enhancing real-time estimates and forecast accuracy, AI is likely to strengthen the decision-making toolbox of the central bank, enabling more prompt reaction (also to tail risks) and more effective communication, as the assessments of the MP transmission and the economic and inflation outlook improve. This should help policymakers to cope with an economy that is likely to feature shorter transmission lags to monetary impulses, as the reactiveness to news increases. Central bank staff should remain firmly in control of the analytical process to ensure a trustworthy use of AI systems and to preserve accountability and public's trust in the central bank. Finally, r^* could increase because of productivity boosts, that raise the capital demand and reduce the capital supply; however, there could be countervailing effects associated with rising inequality and market concentration.

5.1 The economic and inflation outlook

AI is likely to improve the decision-making toolbox for central banks, enhancing real-time estimates (including estimates of tail risks) and forecast accuracy. It is recognized that AI is prone to improve most of the current tasks in central banking, by improving the analysis of data that are both traditional (e.g., the current lagged indicators of inflation, output, and employment) and non-traditional (more timely and/or granular information, such as consumer sentiment, social media activity, search trends, satellite imagery, and mobile location data) as well as by enlarging the information set (Kazinnik and Brynjolfsson, 2025; Zhang, 2025). Concretely, the adoption of AI could mean that the reaction function becomes state-contingent on a richer set of indicators that would be available at a higher time frequency. It could also mean the more ready availability and improvement of critical analytical elements of central banking such as the identification of demand versus supply shocks, the assessment of price pressures, and the possibility of having early warning indicators of, e.g., recessions or dis-anchoring of inflation expectations. Beyond nowcasting, a prominent area

[23] The conduct of modern MP, in the face of transmission lags of monetary impulses, can be characterized as "forecast targeting", meaning "*setting the instrument rate such that the forecasts of the target variables look good*" (Svensson, 2005) relative to the objectives such as the medium-term price stability. In this context, the reaction function of the central bank is a complex function of all the inputs in the MP decision process, involving: (a) collection, processing, and analysis of large amounts of data; (b) the construction of projections of the target variables, the estimation of informative indicators (e.g., underlying inflation) and of the strength of the MP transmission; (c) the use of judgment; (d) communication. As such, it can be rarely characterized by a simple Taylor rule (Nakamura *et al.*, 2025), featuring instead as a "robust" (Hansen and Sargent, 2010) policy-setting – seen as apt to deliver optimality in the face of risk, uncertainty, and model misspecification – that makes explicit the use of risk-scenario analysis to avoid the worst-case outcomes (Kamps *et al.*, 2025). See also Kamps (2024).

where AI could become prolific is on forecasting and risk-scenario design, whereby AI could help not only to stabilize and improve central forecasts, synthetizing in a unique framework the dispersed signals that usually emanate from a variety of macroeconomic models, but also to detect the most relevant risk-scenarios and to assess their likelihood. In short, AI can be seen as a device that makes all the economic agents (being them at a central bank or in the private sector) a step closer to the ideal state of "full information and rational expectations", thus reducing a type of uncertainty that currently bears important policy implications for central banks (Guglielminetti *et al.*, 2025).[24] At the same time, as discussed in the previous sections, AI could introduce new tail risks to financial stability and, given the interlinkages between the financial and real sectors, to the stability of the real economy. The use of AI by central banks for analytical and forecasting purposes could, however, help MP address these tail risks affecting future real GDP growth, inflation, and financial variables.

Central bank staff needs to remain firmly in control of the analytical process to ensure a trustworthy use of AI systems and to preserve accountability and public's trust in the central bank. AI does not have the capacity for self-reflection nor the ability to produce its own safeguards independently of human critical thinking. Confidentiality and privacy should be guaranteed, risks of fraud, cyber-attacks, and reduced operational resilience minimized. On the analytical ground, there should be no complacency for self-referential and biased AI, group-thinking, confirmation bias, reduction capability to question existing theories, produce new ones, and take them to the data.[25]

5.2 The MP transmission

A given MP decision is likely to have shorter transmission lags due to AI. Economic agents are likely to be equipped with better data-management technology that could increase their responsiveness to new information, likely bringing about a higher price flexibility, owing to both firms- and intermediaries-related effects (as discussed in previous sections), potentially benefiting from better central bank's communication too (see below). Then, the consequent greater steepness of the goods' Phillips curve implies a more favourable inflation-output trade-off.

With shorter transmission lags, MP might consider shortening its operative horizon, but other considerations might justify keeping the current medium-term orientation. At the heart of the medium-term orientation of an inflation-targeter such as the ECB there are the "*lags and uncertainty in the transmission of monetary policy to the economy and to inflation*" (ECB, 2025). Indeed, the

[24] This conclusion does not exclude that new challenges in interpretation and data analysis will arise. For example, traditional indicators might lose informative content: consider, e.g., that better forecast accuracy might make the yield curve structurally flatter, hindering its common use as a real time tool for recession detection. In addition, AI-driven analysis might be subject to new types of distortions one will have to be particularly careful about, such as "hallucinations" or "look-ahead bias".
[25] See Cipollone (2024).

theoretical underpinning that "inflation targeting implies inflation *forecast* targeting" (Svensson, 1997) rests on the existence of lags in the transmission of MP impulses. Hence, all else equal, shorter transmission lags would imply a shorter MP operative horizon. Yet, different reasons would justify keeping the current medium-term orientation. First, the nature of shocks matters: the economy might still be subject to shocks, such as supply ones, which require a sufficiently long horizon to be properly "looked through" by the central bank and avoid reaction to information noise. Second, transmission lags might disappear, but trade-offs remain: a strongly reactive central bank to short-term inflation gaps might generate excessive output volatility – a danger that is argued to be particularly relevant with relatively flexible prices and a binding effective lower bound on policy rates (Bhattarai *et al*., 2018). Third, a certain degree of MP inertia is generally found to be optimal, e.g., for financial stability reasons and as a way to steer private-sector expectations (Coibion and Gorodnichenko, 2012; Woodford, 2003). Finally, in an environment where AI is likely to strengthen the role of expectations in decision-making, owing to the improvement in forecasts it brings about, it is important that MP keeps an anchor of expectations over a sufficiently long future – a task which likely means that central bank's communication becomes more relevant in an AI-intensive economy.

MP transmission might be based on improved communication due to AI. It is argued that AI might make MP decisions more effective by allowing a central bank's communication that improves the understanding of the policy decisions by the public, accounting for the idiosyncrasies of different audiences, leveraging on both verbal content and nonverbal signals (Kazinnik and Brynjolfsson, 2025). In addition, communication is likely to become a more relevant tool for central banks if, with the adoption of AI, the economy becomes more responsive to MP impulses while agents, led by better forecast accuracy, become more forward-looking (as argued above). Indeed, in both cases communication would become key to avoiding possible over-reactions, helping to anchor medium-term expectations which, therefore, would remain pivotal for central banks' effectiveness despite the potential shortening of the MP transmission lags.

5.3 The natural real interest rate *r**

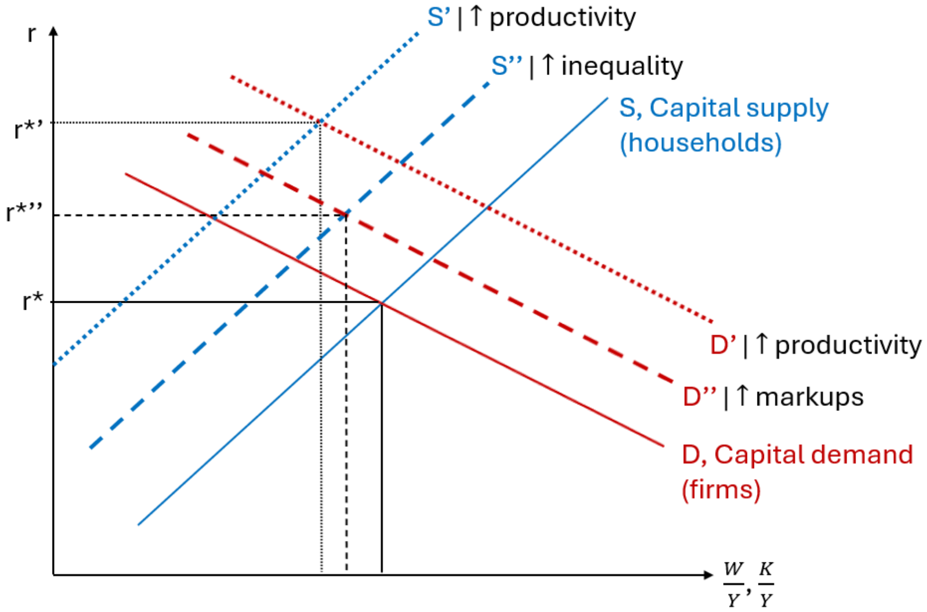
The AI-related productivity boost could increase *r, though the magnitude of the effect is uncertain**. Based on standard macroeconomic theory, the most direct effect of the higher (labour) productivity would be an increase in *r**, since the associated higher growth expectations induce firms to boost their capital demand, as they make the most of the higher return on investment, and households to reduce the capital supply, as long as the higher expected future income means that they have to save less to sustain future consumption.[26] However, the size of this direct effect is highly

[26] For a discussion of these standard channels see e.g. Rachel and Smith (2015).

uncertain, given the wide range of possible productivity gains (see the beginning of Section 4) and the uncertain degree of substitutability between AI-specific capital and labour (Melina and Villa, 2025), while households might engage in more precautionary savings if AI leads, for instance, to higher labour displacement rates to insure against.

Beyond productivity gains, AI-led rises in markups and inequality could act as significant *r-reducing factors**. AI might increase markups by favouring large firms that have access to larger amounts of data, and shift the income distribution away from labour, or from workers with unsuitable skills, fostering income and wealth inequality. The most likely effect would be a reduction of r^* as the wealthiest households become even wealthier and, thus, boost the capital supply, while weaker competitive pressures depress investment, thus reducing the capital demand (Figure 4).[27]

Figure 4 – The natural rate in the pre-AI and in the AI-intensive economies



Notes: The figure illustrates the equilibrium in the capital market where households provide capital by saving (capital supply) while firms require capital for investment (capital demand). The real interest rate that prevails by market clearing (r^*) is such that the wealth to income capital (W/Y) equals the installed capital over income (K/Y). AI could affect the capital market equilibrium because of productivity boosts that shift the supply inward and the demand outward, while increases in wealth inequality and markups could mitigate the associated rise in r^* by shifting both the demand and supply in the opposite direction compared to the productivity-driven shifts.

[27] Rachel (2025) models the prospective adoption of AI as a boost of Total Factor Productivity growth by 0.75 ppts over a decade and by 0.25 ppts thereafter, coupled with a rise in markups and capital intensity that jointly yield a gradual decline of the labour share of income by up to 1.1 ppts, finding that r^* increases by about 1 pp over the next decade. However, he does not model the associated increase in wealth inequality (potentially significant for the top 10% versus the bottom 50% of the wealth distribution, see Gazzani and Natoli, 2024) which notoriously dampens r^* since rich households have higher wealth relative to income (Auclert *et al.*, 2025). The presence of non-homothetic preferences by households, i.e. such that the saving rate rises with wealth so that the capital supply is downward sloping, is key in Caballero (2026) to predict a permanent decrease of r^* in an AI-driven transition where the rise in wealth associated with capital accumulation goes together with the rise in inequality.

6. Conclusions

This paper provides a first assessment of the impact of AI on the macroeconomic and financial environment, the risks to financial and macroeconomic stability as well as the transmission mechanism and reaction function of MP. A widespread diffusion of AI could make the economy and prices more flexible and responsive to shocks. AI could also increase tail risks for macroeconomic, monetary, and financial stability and speed up and weaken the transmission of MP through credit markets.

In the AI-intensive economy, macroeconomic stabilization can become even more challenging for central banks, as the reaction of financial markets to news and policy mistakes could increase and become even faster than it is already.

Still, AI could contribute to enhancing central banks' effectiveness in stabilising macroeconomic conditions by improving the assessment of the macroeconomic outlook and the risks surrounding it, while also supporting the communication of MP decisions. Further analyses could address these issues.

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