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THE IMPACT OF CENTRAL BANK DIGITAL CURRENCIES (CBDCS) ON SYSTEMIC RISKS AND THE STABILITY OF THE BANKING SECTOR IN THE CONTEXT OF THE GREEN ECONOMY TRANSFORMATION

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Abstract: This paper addresses a structural tension that is already visible in bank-based financial systems, including the Russian case. Central bank digital currencies (CBDCs) are presented as instruments capable of increasing payment transparency, enabling programmable and targeted public transfers, and reducing the transaction costs of cross-border green investment flows. At the same time, their introduction may weaken the banking sector's traditional intermediation role, creating the risk of deposit outflows and balance sheet erosion in commercial banks – the very institutions that still provide long-term credit to the real economy and finance the energy transition.

The objective of the study is twofold: first, to assess how specific design features of retail CBDC (a two-tier distribution model through commercial banks, the absence of interest on CBDC holdings, and quantitative limits on individual balances) affect the stability of the banking sector; and second, to evaluate whether such a design can function as an institutional layer for targeted green finance without undermining the bank-based credit channel.

Methodologically, the paper relies on an institutional and comparative assessment of three CBDC frameworks: the digital ruble, the e-CNY, and the proposed digital euro. The analysis focuses on channels of financial risk (deposit reallocation away from banks, rapid digital withdrawals by depositors during stress episodes, pressure on banks' fee and interest margins) and channels of opportunity (programmable disbur-

sement of green subsidies, traceability of ESG-linked financial flows, and emerging cross-border multi-CBDC settlement platforms such as mBridge).
The contribution of the paper lies in bringing together two strands of debate that are often treated separately in the literature: the question of financial stability under retail CBDC, and the question of institutional infrastructure for sustainable finance. The paper argues that CBDC can be conceptualised as a potential settlement layer for green finance, provided that its design preserves the ability of commercial banks to act as the primary lenders to long-horizon decarbonisation projects.

Keywords: *CBDC; financial stability; bank disintermediation; green economy; sustainable finance; programmable payments; monetary policy transmission; mBridge; digital ruble; digital euro; e-CNY.*

1. INTRODUCTION

The digital transformation of monetary and financial systems and the transition toward a low-carbon economy have largely been studied as separate agendas. Central banks, however, are moving rapidly toward the testing and phased deployment of central bank digital currencies (CBDCs), presenting them as a new layer of payment infrastructure, a tool for greater transparency of money flows, and, in some jurisdictions, an instrument of monetary sovereignty. As of 2024–2025, more than 90% of surveyed central banks report active work on CBDC design, and several jurisdictions (including China, Nigeria, the Bahamas, and Jamaica) have already entered either pilot or early operational phases. [1] In the cross-border dimension, CBDC experiments such as mBridge and Agorá are increasingly framed in geo-economic terms, including ambitions to reduce reliance on the U.S. dollar in international settlements, especially in energy and commodity trade. [13]

In parallel, many governments have placed the "green transition" at the center of their development strategies. This transition presupposes sustained, large-scale investment in low-carbon infrastructure, energy efficiency, and the decarbonization of supply chains. International organizations consistently point to a chronic financing gap between stated climate targets and the volume of capital actually mobilized for sustainable development, particularly in emerging economies. [17] This raises a strategic policy question: can CBDC design evolve into an institutional infrastructure that not only lowers the cost and increases the transparency of payments, but also enables targeted, monitorable, and enforceable financing of green projects?

The potential benefits are accompanied by system-level vulnerabilities. The introduction of a retail CBDC changes the liability structure of households and firms, places CBDC in direct competition with commercial bank deposits, and, at least in theory, may trigger a large-scale shift of liquidity away from banks into "central bank money for all". This creates a direct challenge to the traditional intermediation role of banks, and thus indirectly threatens the flow of credit to the real economy – including

long-horizon green investment, which in most bank-based systems is still largely funded through bank balance sheets. The IMF and several central banks have emphasized the risk of bank disintermediation, i.e. the erosion of the deposit base and lending capacity of commercial banks, as well as heightened instability of bank funding in periods of stress. [8, 10, 3] The European Central Bank, for example, has constructed stress scenarios in which, under conditions of market panic, a retail digital euro could pull hundreds of billions of euros out of bank deposits within days, effectively enabling an immediate flight into a risk-free digital claim on the central bank. [12]

The novelty of this study is twofold. First, it examines how the emergence of CBDC affects banking-system resilience and systemic risk in the context of an ongoing green transition, in which commercial banks remain the dominant channel for supplying long-term capital to sustainability-related projects. Second, it asks whether it is possible to design a CBDC in such a way that it simultaneously reduces transaction costs and improves the traceability of "green" financial flows, while avoiding the erosion of banks' deposit base and their ability to extend credit.

The aim of the paper is therefore to analyse how alternative CBDC architectures influence the stability of the banking sector, and to identify the key design parameters of a CBDC model that is compatible with the objectives of the green transition without undermining banking-sector resilience.

To address this aim, the paper pursues four interrelated objectives:

1. To describe and compare the main architectural models of retail CBDC (direct distribution by the central bank; two-tier/intermediated distribution; models with holding limits and zero remuneration).
2. To identify and formalize the main transmission channels through which CBDC affects banks (liquidity conditions, profitability, disintermediation of deposits, and changes in the role of banks in monetary policy transmission).
3. To assess the potential for CBDC to act as an instrument for scaling up green investment, through programmable transfers, auditable use-of-funds tracking, and lower transaction costs in sustainable finance.
4. To formulate the parameters of a "balanced deployment" of CBDC that contain financial stability risks while supporting the financing architecture of the green transition.

The contribution of the paper lies in drawing together two research agendas that are typically kept apart in the literature: (i) banking-sector stability and monetary transmission in the presence of a retail CBDC; and (ii) the institutional architecture of sustainable and climate-oriented finance, which relies on verifiable allocation of funds to low-carbon activities. Recent work tends to treat these areas separately – either as a question of financial stability under CBDC, or as a question of targeted green subsidies and climate finance – but rarely integrates them into a single regulatory and institutional framework. [5, 8, 10, 16]

2. METHODOLOGY

The study employs a qualitative-analytical methodology. The first step is an institutional and comparative analysis of national CBDC designs (China, Russia, the European Union), with particular attention to three structural parameters:

1. The allocation of functions between the central bank and commercial intermediaries (direct vs. two-tier/intermediated models).
2. The treatment of CBDC balances (interest-bearing vs. non-interest-bearing holdings).
3. The existence and level of quantitative holding limits for individual users.

In the case of the e-CNY, the People's Bank of China issues the digital yuan, while commercial banks and licensed payment providers distribute it to end users and maintain customer interfaces, thereby preserving the banks' role as intermediaries. A similar approach is being tested in the pilot of the digital ruble: client servicing remains with commercial banks, balances in digital ruble wallets do not accrue interest, and the digital ruble is positioned primarily as a means of payment rather than as a store-of-value instrument. In the European Union, current discussions envision a retail digital euro to be distributed via supervised intermediaries (banks and payment service providers), with zero remuneration on balances and with individual holding limits in the order of several thousand euros per user, in order to reduce the risk of large-scale deposit migration out of commercial banks. [11, 12]

The second step is an assessment of the transmission channels through which CBDC may affect financial stability. Building on analytical work by the IMF and by central banks, the paper considers: (i) the erosion of the deposit base of commercial banks; (ii) downward pressure on banks' net interest income and fee-based revenues; (iii) the risk of rapid, large-scale digital withdrawals from bank deposits into a risk-free central bank liability during periods of stress; and (iv) the potential reconfiguration of monetary policy transmission and liquidity distribution once households and firms gain direct access to central bank money. [4, 10, 12]

The third step is an assessment of the "green potential" of CBDC. In this paper, that term refers to the ability of a CBDC framework to

- lower transaction costs in sustainable finance, including cross-border flows;
- ensure traceability and verifiability of how funds earmarked for green purposes are actually used;
- enable targeted public support for climate-related investments through programmable transfers and conditional disbursements;
- provide an operational basis for the tokenization and settlement of green assets, such as carbon credits and green bonds.

This part of the analysis draws on recent work in the emerging field of "green digital finance", which treats CBDC not merely as payment infrastructure but as a po-

tential instrument for implementing climate policy in practice. In such a setting, green subsidies and concessional funding for environmentally significant projects can be disbursed in a programmable form, and subsequent use of funds can be monitored against environmental and social sustainability criteria. [3, 14, 15]

Taken together, these elements define the central research problem addressed in this study: to identify a configuration of retail CBDC that both limits the erosion of the banking sector's intermediary role – thereby preserving banks' ability to fund long-horizon decarbonization projects – and, at the same time, equips CBDC to function as an instrument for targeted sustainable finance.

3. LITERATURE REVIEW

3.1. Money as a state institution and the evolution of monetary forms

Classical "state theories of money" (Knapp, 1905) and the subsequent Keynesian interpretation of money as a public liability and a tool of macroeconomic governance (Keynes, 1930) emphasize the role of the state – and, by extension, the central bank – as the ultimate guarantor of the unit of account. Monetarist theory, notably associated with M. Friedman, conceptualized money as a nominal anchor whose supply should be predictable and disciplined. (Friedman, 1969) In contemporary debate, retail CBDC is often described as the extension of central bank money into the retail domain – in effect, "reserves for everyone". [2, 10, 13] This represents a qualitative break with the long-standing two-tier structure of modern monetary systems, in which households and firms ordinarily hold either physical cash (a direct liability of the central bank) or bank deposits (a liability of commercial banks). CBDC weakens that distinction by giving non-bank actors direct access to a risk-free central bank claim.

3.2. Transaction costs and the institutional design of payment systems

R. Coase's analysis of transaction costs (Coase, 1937) and O. Williamson's later work on institutional arrangements (Williamson, 1985) both highlight that economic actors continuously seek to reduce the costs of finding a counterparty, contracting, and enforcing delivery. CBDCs are being designed precisely to compress these frictions: they aim to provide instant, low-cost, programmable settlement with minimal intermediation. This is particularly relevant for cross-border transactions, traditionally the most expensive and operationally cumbersome part of international payment flows. [13] For green investment projects, which are often financed by multi-jurisdictional consortia and rely on timely disbursement of grants and preferential funding, the ability to move verified funds quickly and transparently is non-trivial.

3.3. Bank intermediation, financial fragility, and the role of liquidity

H. Minsky's account of financial instability theory characterizes modern banking systems as inherently prone to fragility: in pursuing credit expansion, banks simultaneously expose themselves to liquidity shocks. (Minsky, 1986) Contemporary CBDC research effectively transposes this logic into the digital era. Once households and firms gain access to a central bank liability that is instantly transferable and perceived as risk-free, deposit outflows from commercial banks in a stress episode may become not just rapid but near-instantaneous. [7, 8, 10] Regulators – particularly in the euro area – have begun to model the magnitude of such episodes. In severe stress scenarios, a retail digital euro is assumed to be capable of drawing hundreds of billions of euros out of commercial bank deposits within a very short time frame, forcing banks to seek emergency liquidity or alternative wholesale funding. [12]

3.4. Digital finance, the green transition, and programmable money

A substantial body of work has also emerged around "green finance" and "digital sustainability". This literature examines how financial technologies and digital platforms can improve the transparency of climate-related capital flows, reduce information asymmetries, and limit "greenwashing", i.e. claims of environmental benefit that cannot be substantiated. This line of inquiry is now converging with the CBDC debate. Researchers argue that the programmability of CBDC – including embedded conditional transfers, spending constraints, and auditable payment trails – can be used to

- channel preferential public funding only to projects that meet a recognised green taxonomy;
- monitor ex post whether funds are used in line with stated environmental performance indicators;
- speed up cross-border climate-related payments via multi-CBDC settlement platforms such as mBridge and Agorá. [14, 15]

A related direction of inquiry links CBDC to emerging markets for carbon credits and for real-time energy trading. Under this view, CBDC can serve as the settlement layer of an integrated ecosystem in which tokenized claims – for example, on megawatt-hours of renewable energy or on certified emissions reductions – are transferred and settled automatically among participants. [2, 15]

4. RESULTS

The introduction of a central bank digital currency (CBDC) has been analysed along two dimensions that are critical for economies undergoing a structural transition. The first concerns the risks posed to banking sector resilience and overall financial stability. The second concerns the potential of CBDC to serve as an institutional backbone for a scalable system of green finance.

4.1. Risk channels (banking sector resilience and financial stability)

A retail CBDC directly competes with commercial bank deposits as a store of liquid value. Where a CBDC is designed to be interest-bearing – a possibility explicitly discussed in several jurisdictions – households and firms may reallocate part of their cash balances away from commercial banks and into a direct liability of the central bank. This weakens the stability of banks' funding base and may, in turn, constrain their capacity to supply credit to the real economy, including capital-intensive green projects with long payback horizons[1]. [8, 9, 10]

Evidence from ongoing pilots suggests that the scale of potential disintermediation is highly sensitive to specific design choices. In the Russian digital ruble model, balances are not remunerated and the instrument is explicitly positioned as a means of payment rather than a savings vehicle; under this approach, outflows from term and interest-bearing deposits are expected to remain contained.

In the case of the e-CNY, distribution is channelled through commercial banks, which preserves their role as the primary interface with clients and limits the direct displacement of banks from the customer relationship.

In discussions on the digital euro, it has been proposed that individual holdings be subject to quantitative limits on the order of EUR 3,000–4,000 per user and that such holdings be non-interest-bearing. This is intended to discourage the use of CBDC as a store of value and, as a result, to limit large-scale liquidity migration away from the banking system[2]. [11]

Episodes of systemic stress in the banking sector have historically been accompanied by a rapid shift by depositors into assets perceived as safer – cash, sovereign bonds, or foreign currency. The introduction of a retail CBDC adds a new form of perceived safety: an immediately transferable, risk-free liability of the central bank, accessible at essentially no friction.

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1 Reuters. Digital euro could drain up to 700 billion euros of deposits in bank run, ECB says. October 10, 2025. https://www.reuters.com/business/finance/digital-euro-could-drain-up-700-billion-euros-deposits-bank-run-ecb-says-2025-10-10

2 Bruegel. Maria Demertzis Juan Mejino-López On the digital euro holding limits. 16 July 2024. https://www.bruegel.org/analysis/digital-euro-holding-limits

According to simulations conducted by the European Central Bank, under severe stress conditions a digital euro could trigger an abrupt withdrawal of deposits on the order of hundreds of billions of euros from commercial banks, forcing several large euro area institutions to seek immediate liquidity support[1].

This dynamic is consistent with Minsky's financial fragility hypothesis, which views bank funding structures as inherently unstable under stress; the difference in the CBDC context is that the speed and scale of deposit flight become technologically amplified.

CBDC may also erode traditional revenue streams in the banking sector. If day-to-day payments migrate to an infrastructure operated or overseen by the central bank, with zero or near-zero transaction fees for households and only minimal fees for firms, banks and private payment providers face pressure on both fee income and payment-related margins. In the Russian pilot model, for example, proposals envisage no fees for individuals and tightly capped fees for corporate users, broadly aligned with the cost of existing instant payment systems. This effectively shifts the center of gravity in the payments market toward a state-controlled infrastructure and requires banks to develop new sources of income, including through value-added services built on top of CBDC.

At the same time, CBDC has the potential to strengthen the direct transmission of monetary policy. If CBDC balances were to be explicitly linked to the central bank's policy rate, changes in the key rate could be transmitted to households and firms almost instantaneously, bypassing the traditional lag associated with the banking sector. This would give the central bank a more immediate lever over aggregate demand. However, it would also weaken the position of commercial banks as the necessary intermediary between monetary policy decisions and credit allocation in the real economy. In this sense, CBDC does not merely introduce a new retail payment instrument; it alters the structure of the credit channel itself and may shift effective control over the allocation of credit – including the allocation of credit to green projects – from banks toward the central bank.

4.2. Opportunity channels (CBDC as an infrastructure for the green transition)

From a technological standpoint, a CBDC can be made programmable: individual balances can be tagged by purpose, time-limited, or restricted to specific categories of expenditure. This creates the possibility for the central bank or a public authority to extend preferential financing to activities classified as environmentally significant – for example, industrial energy-efficiency upgrades, renewable energy deployment, or low-carbon transport – while simultaneously enforcing compliance with predefined environmental criteria. [14, 16] In practical terms, this reduces two persistent

[1] Reuters. Digital euro could drain up to 700 billion euros of deposits in bank run, ECB says. October 10, 2025. https://www.reuters.com/business/finance/digital-euro-could-drain-up-700-billion-euros-deposits-bank-run-ecb-says-2025-10-10

problems in climate policy: leakage of funds into non-eligible uses, and distortions arising from discretionary allocation of green subsidies.

A "green voucher" embedded in CBDC illustrates this logic. Such a voucher could be spendable only on certified energy-efficiency equipment, and all disbursements would be recorded in real time. This would significantly simplify auditing, lower the administrative cost of climate-related support schemes, and make the disbursement process more resistant to misallocation.

A further structural issue in sustainable finance has been the credibility of green claims. Markets for green bonds and ESG-labelled instruments continue to face doubts regarding the verifiable environmental effect of funded projects and the risk of "greenwashing", understood as attributing an environmental benefit that cannot be demonstrated ex post. A retail CBDC issued under public authority and operating on traceable payment rails would make it possible to embed environmental tagging directly into payment flows and to verify whether a funded project conforms to an accepted sustainable finance taxonomy. This, in turn, strengthens investor confidence and reduces informational asymmetry – an especially important factor for cross-border climate finance, where monitoring and enforcement are costly and politically sensitive. [14, 15, 16]

Multi-CBDC platforms – most notably mBridge, which is being developed at the "minimum viable product" stage by the central banks of China, Hong Kong, the United Arab Emirates, Thailand, and Saudi Arabia – are testing near-instant cross-border settlement between jurisdictions without relying on correspondent banking chains or U.S.-dollar clearing[1]. [10] Such an arrangement can dramatically reduce both the cost and the settlement time of cross-border transfers. This is of particular relevance for large-scale green infrastructure projects, which are frequently financed through consortia that combine sovereign funds, state development banks, and private investors from multiple jurisdictions.

Recent academic work goes further and treats CBDC as a potential settlement layer for emerging markets in carbon credits and distributed energy trading. In this view, CBDC can support the accounting of certified renewable energy generation, the issuance of tokenized rights to consume or resell that energy, and the automated settlement of payments linked to verified CO_2 reductions. [15, 16] Under such an architecture, environmental assets become fully digital, transferable with minimal transaction costs, and settled in a legally recognised, sovereign form of money – namely, the CBDC.

[1] Reuters. Marc Jones Saudi Arabia joins BIS- and China-led central bank digital currency project. June 5, 2024. https://www.reuters.com/technology/saudi-arabia-joins-bis-led-central-bank-digital-currency-trial-2024-06-05

5. DISCUSSION

The analysis reveals a structural tension. On the one hand, CBDC can amplify vulnerabilities in the traditional banking model: deposits may migrate out of commercial banks, fee-based payment income may erode, and episodes of stress may trigger rapid, large-scale digital withdrawals by depositors. These effects directly weaken the resilience of banks, which in many jurisdictions continue to serve as the primary financiers of capital-intensive green infrastructure and other long-horizon projects. [8, 10]

On the other hand, CBDC introduces policy instruments that the current financial architecture does not adequately provide:

- programmable allocation of targeted support, including climate-related subsidies;
- transparent tracking of funding streams earmarked for environmental objectives;
- lower transaction costs for cross-border climate and sustainability finance;
- the technical possibility of integrating carbon markets and clean energy trading into a coherent, state-recognised settlement environment. [14, 15, 16]

In this sense, CBDC has the potential to operate as an enabler of the green transition – but only insofar as its introduction does not undermine the banking sector's capacity to finance that transition.

This in turn points to the need for a balanced approach to CBDC design.

1. Intermediated, two-tier distribution.

Under this arrangement, the central bank issues the CBDC, but does not assume day-to-day retail servicing of households and firms. That function remains with commercial banks and licensed payment providers. Such a model – reflected in current practice and proposals across several jurisdictions – preserves the economic relevance of banks, maintains their direct client relationships, and alleviates politically sensitive concerns that retail payments could become a fully nationalised function.

2. Non-interest-bearing CBDC and quantitative holding limits.

When individual CBDC balances are capped (for example, in the range of EUR 3,000–4,000 per person in the digital euro proposals) and balances are not remunerated, the instrument is anchored as a means of payment rather than as a vehicle for wealth storage. This reduces incentives for large-scale migration of deposits out of commercial banks[1]. [11] The pilot model of the digital ruble – where CBDC is explicitly

[1] ECB. №2980 Claudia Lambert, Chloe Larkou, Cosimo Pancaro, Antonella Pellicani, Meri Sintonen Digital euro demand: design, individuals' payment preferences and socioeconomic factors. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2980~5f64961c8f.en.pdf

positioned as a settlement instrument rather than a deposit substitute – follows the same underlying logic.

3. Regulated programmability.

CBDC should allow for programmable functions – for example, earmarked transfers, conditional spending, or time-bound funds – but access to this functionality must remain within a supervised perimeter. In practice, this implies that commercial banks, development institutions, and public entities responsible for financing sustainable investment are granted controlled access, enabling them to structure green lending products and administer targeted support for low-carbon sectors. At the same time, purely private, unsupervised smart-contract schemes are not given unchecked authority over public money. This preserves banks' role as core assessors and bearers of project risk, rather than displacing them from long-term sustainable lending. [14]

4. Cross-border interoperability.

Participation of central banks in multi-jurisdictional CBDC platforms (such as mBridge and Agorá) should be coupled with common standards for disclosing the environmental characteristics of financed projects. This is essential for channeling climate-related investment across borders and for financing the deployment of low-carbon technologies in energy systems. [13]

Taken together, these elements suggest that the regulatory objective is not merely to "issue a digital currency", but to embed CBDC as an institutional layer of green finance without destabilizing the banking sector. Banks continue to perform screening, credit allocation, and risk monitoring at the project level; the CBDC infrastructure is meant to support that function, not replace it.

From a theoretical standpoint, the findings confirm, in digital form, the core intuition of Minsky's framework: bank liquidity is structurally fragile, and this fragility intensifies under stress. At the same time, the results indicate that institutional design – notably balance caps, the absence of remuneration on CBDC holdings, and a two-tier distribution model – can mitigate that fragility. [10, 2, 7]

In parallel, the ability of CBDC to lower transaction costs and to make the end-use of funds transparent effectively extends the Coase–Williamson perspective on transaction costs into the domain of climate policy. In other words, CBDC equips the public sector not only with a macro-level tool – via a more direct channel of monetary transmission – but also with a micro-level instrument for allocating, conditioning, and auditing sustainability-oriented subsidies and concessional finance.

6. CONCLUSION

The findings of this study point to a fundamental tension that is of direct relevance for economies pursuing a low-carbon transition. The introduction of a central bank digital currency (CBDC) can, on the one hand, increase the structural vulnerability of the banking sector – which, in practice, remains the main channel for long-term financing of climate-related and modernization projects. On the other hand, CBDC offers policy instruments capable of addressing long-standing structural weaknesses in green finance: high transaction costs, limited transparency over how earmarked funds are actually used, and the risk that environmental benefits are claimed but not delivered.

Addressing this tension is not a binary choice between financial stability and accelerated green investment. It is a matter of institutional design. The analysis suggests that a viable CBDC model for the green transition must incorporate three core properties.

First, financial stability must remain the primary constraint. CBDC should function as a settlement instrument, not as a full-fledged savings vehicle. In practice, this implies non-remunerated balances, enforceable limits on the maximum amount that any individual user can hold, and the continued involvement of commercial banks in servicing clients. Such a configuration helps to contain deposit outflows from banks, reduces the risk of rapid, large-scale shifts of funds from commercial deposits into a risk-free central bank liability, and thereby preserves banks' capacity to extend credit to the real economy, including projects aligned with environmental, social, and governance (ESG) objectives.

Second, CBDC should be understood as an infrastructure layer for targeted sustainable finance. Programmable disbursement and traceable payment flows make it possible to direct concessional funding and subsidies to environmentally certified projects, and to monitor ex post whether those funds are used in line with stated climate objectives. This, in turn, can strengthen credibility in markets for green bonds, carbon credits, and emissions allowances, and supports the integration of such instruments into a unified digital settlement environment.

Third, the role of banks should be reframed, not diminished. Rather than being displaced as intermediaries, banks can become institutional operators within the new architecture. Their function shifts from routine payment processing toward providing higher-value services built on top of CBDC: managing dedicated "green" wallets for firms and households; structuring financial products for low-carbon investment; verifying environmental performance indicators; and accompanying projects that seek preferential treatment under sustainability frameworks. This redefined role creates new revenue opportunities for banks and, at the same time, reinforces the transmission of public economic policy – including the prioritization of climate-related investment.

In summary, CBDC is neither a universal catalyst for the green transition nor an inherent threat to financial stability. Its net impact is determined by the quality of regulatory and institutional design. A viable model of CBDC in the context of sustainable development is one in which the instrument remains constrained as a store of value, yet is endowed with a high degree of controllability and targeting capacity for financing environmentally significant projects. The objective is not to replace the banking system, but to provide it with a more transparent, operationally predictable, and governable financial infrastructure for decarbonization.

Limitations of the study. The present analysis is qualitative in nature. It does not provide quantitative estimates of potential deposit outflows under different CBDC designs, including those currently piloted in major jurisdictions, nor does it quantify the macroeconomic contribution of programmable "green" transfers to investment dynamics or output growth. Issues related to data governance, privacy, and the cyber-resilience of CBDC infrastructures have likewise not been examined in depth and require separate treatment.

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