STRATOS
Research

The Digital Euro as Europe's Path to Monetary Sovereignty

Design, Risks, and Global Comparisons

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The digital euro, a topic discussed at all levels. The objective of this research paper is to tackle the matter in its entirety, both by:

- looking at the geopolitical landscape and responses to diverse policies,
- hypothesizing its technical application to infer possible results on welfare.

The first four chapters will answer the question: "What is the euro-CBDC (Central Bank Digital Currency), and what is the geopolitical situation in this regard?" The paper will, in fact, firstly analyse the European reasons for the application of this innovative technology, the deteriorating conditions among the population that led to its consideration, how the complex machinery of fiscal administration works in this regard, and how Europe plans to address these challenges. Consequently, it will discuss how internationalization, in a fully globalized world, can function, taking into account all possible nuances and inefficiencies present in the current standard system. It will then proceed to explain how the United States has approached the introduction of a digital currency, highlighting the fundamental difference between cryptocurrencies and a centralized CBDC (a public, privacy-efficient form of currency). Then, to assess the effectiveness of a digital currency, the paper examines China's pioneering approach, highlighting how its rapid implementation capacity has intensified strategic competition with Western economies. In conclusion, the final chapter will attempt to answer the question—through Matlab simulations: "Should Europe create a CBDC?" The idea behind this final methodological approach is to demonstrate, factually, that the introduction of a digital currency can have a positive large-scale effect. *"A digital euro [CBDC], existing alongside cash, would future-proof our currency. It would be safe, easy to use, and free of charge." – Christine Lagarde, Governor European Central Bank.[25]*

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1. Introduction

Every historical period has undergone its own revolution, whether industrial or political, we have always witnessed it. Attention is often paid, especially in educational institutions, to the so-called changes in the means of production and how they were instrumental in the reversal and reshaping of all the macroeconomic variables they affected (from the unemployment rate to the fluctuation of interest rates). What tends to be underestimated is the extent to which the change in financial processes and the reversal of the socio-economic hierarchy of bargaining power are real factors of transformation. An attentive eye would, in fact, realise how dependent on the financial framework all these changes are, including their many facets. Avoiding a redundant historical explanation of all the evolution undergone by the monetary system, means of exchange and financial system, as it is absolutely beyond the scope of this paper, I would like to start analyzing the relocation from fiat money (taking into account its triple function of a means of payment, unit of account, and store of value) to a centralized digital currency (becoming merely a medium of exchange)[41]. Obviously, this shift is occurring simultaneously on several fronts, and the current geopolitical situation is playing decisively in favor of some, but disastrously for others.

2. The European approach to digital currency

Let's start by outlining an analysis of Europe and its innovative approach in the field of digital currency. The digital euro is a public currency issued by the ECB that can be used by third-party entities through digital wallet interfaces, in a manner analogous to existing e-payment tools. It therefore involves payments with immediate credit, regulated by a European infrastructure. As a matter of fact, having established it as an official goal for 2029, Europe aims to shift its monetary framework entirely to digital form: the new CBDC (Central bank digital currency)[6]. The CBDC is conceived as a complement to the existing payment system, simplifying transactions while reinforcing the role of the central bank in the monetary and payment system. Indeed, what Christine Lagarde and the entire European financial community continue to push for, is the dire need for monetary sovereignty within trade[6, 22]. Until now, the world has always been dependent on a tripartite exchange structure, driven by the economic movements of commercial banks and private monetary circuits (Mastercard and Visa). With this new technology, CBDCs would be set apart from payment cards by the blanket reduction of all transaction costs, making it convenient not only for local transactions but also for international trade. This would not only mean a re-publicisation of monetary and financial control, but it would make the CBDC a strong alternative to the dollar in the SWIFT (Society for Worldwide Interbank Financial Telecommunication) system[24, 29, 33]. Digressing a bit about the SWIFT model, it could be defined as a standardized messaging system that allows over 11,000 banks to exchange payment orders, theoretically, in any currency. As of now, the US dollar dominates the economy and is the most widely used currency online. Until August 2024, the dollar accounted for 49.1% of global payments (a figure that rises to 60% if we exclude payments within the Eurozone). Since much of world trade is denominated in USD (not to mention all those countries that also peg their national currencies to the dollar), many transactions require forced passage through American intermediary banks and the American clearing

system (such as CHIPS), all of which are tightly integrated into the Federal Reserve system. This forces global banks to comply with US regulations to avoid losing access to "dollar liquidity." Now, SWIFT is based on the dollar, not in technical or protocol terms, but in the practice of US economic dominance in global trade.

2.1. Supplantation of the Dollar in the SWIFT

A case in point for the necessary autonomy in monetary matters is the impact Russia and Iran suffered after being forced out of using the dollar. In response, they promoted the use of local currencies (such as the Chinese yuan) and alternative payment messaging systems like Russia's SPFS or Iran's SEPAM to bypass SWIFT. Even China, because of the growing tensions, has accelerated de-dollarization within BRICS by promoting the yuan (RMB) for trade settlements—now over 50% of its mutual trade with Russia—and piloting the digital yuan (e-CNY) for cross-border payments. Through the mBridge project (a multi-CBDC platform with the BIS), China tests blockchain-based settlements among BRICS nations, reducing reliance on U.S.-dominated clearing while enhancing yuan internationalization even more [14, 26, 27, 40]. It is this fear and growing tension that have led Europe to respond decisively with more efficient and publicly centralized systems, with virtual currency issued directly by the ECB. This is a new choice, unhinged from the standard that has been followed until now. We are indeed witnessing one of the greatest wave of re-publicization of all political, social, and economic dynamics. The end goal would be the achievement of a better social parity against the division brought by privatization. This would therefore be a destabilization of those roots embedded in the large-scale financial order, with all its attendant benefits[19, 21]. With the CBDC, we're talking about real-time settlement (24/7/365), guaranteed by an autonomous European payment infrastructure, resilient to geopolitical shocks and foreign government decisions, eliminating counterparty risk and accelerating the slow and delayed crediting of the dollar within SWIFT. The real radical change, however, occurs within the definition given to money. In the commercial banking system, deposits function as credit instruments within banks' leverage structure, repayable only up to €100,000 per depositor under EU guarantee schemes. The digital euro, by contrast, would constitute a direct ECB liability, functionally equivalent to cash and therefore not subject to the same default risk. Therefore, unless the euro itself fails as a medium of exchange, CBDC cannot fail. Finally, given its equivalence to cash, an offline payment method is envisioned (via chip or dedicated wallet) that would allow money to be exchanged even without an internet connection, and with an unprecedented level of privacy. This dynamic is impossible under current private financial intermediation[7, 22].

Characteristic	**Current System (SWIFT/Bank Transfers)**	**Digital Euro (CBDC)**
Issuer	Commercial Banks	European Central Bank (ECB)
Speed	From minutes to days (SWIFT is slow)	Snapshot
Availability	Banking hours (often Mon-Fri)	Always available (24/7)
Costs	Bank/Interbank Commissions	Free for basic citizen use
Dependence	High (depends on external nodes and currencies)	Nothing (European sovereignty)

3. The archetype creation of money

Continuing with the depiction of the European framework, it is important to compare it to the assessed old system, to be able to furnish theoretical foundations for the future project of implementation. The primary objective is to analyze economic systems as complex and adaptive networks of interacting agents, rigorously monitoring financial flows and balances, capturing the endogenously circulating nature of money.

Within the current monetary architecture, transactions typically take the form of the tripartite relationship involving a buyer, a seller, and a financial intermediary. This structure becomes particularly relevant when credit creation is involved, since commercial banks ex-

pand the money supply through their balance sheets and subsequently rely on the interbank settlement system to clear payments among themselves. When such a tripartite transaction takes shape, the bank lends money to a private buyer, thereby creating a debt entry for the borrower and a corresponding liability in the form of a deposit on the bank's balance sheet. This mechanism represents the basic partition of the monetary economy. The framework is called the Agent-Based Stock Flow Consistent model. The dynamic vision of this model combines two methodologies: agent-based modeling (ABM), a simulation of heterogeneous actors (e.g., households, firms, banks), and stock-flow consistency (SFC), a rigorous accounting system that ensures all financial transactions are tracked without contradictions. A consumer borrows €1,000 from a commercial bank, which creates a new deposit as a liability on its balance sheet—effectively expanding the money supply through fractional reserve lending. This loan asset requires repayment, secured by collateral and interest to cover default risk. The bank gains a profitable asset without depleting existing reserves, though it must hold liquidity buffers for outflows. This is the main way in which money is created. Commercial banks sustain this through central bank facilities like repos, discount windows, open market operations, and reserve requirements to manage settlements and shocks. With a CBDC, deposits shift partly from commercial banks to the ECB, constraining their lending multiplier and raising funding costs, without fully eliminating private money creation. Going back to the tripartite transaction, as the private consumer spends the money borrowed, the deposits move among the agents. The system's total financial stocks and flows, though, remain constant, reflecting the tripartite structure of the fiat circuit, in which each transaction involves a buyer, a seller, and a financial intermediary, ensuring that money flows are tracked across all balance sheets. This system has led to a significant global strengthening of the aforementioned private circuits and, with them, all the private commercial banks that result from them. The ultimate goal, therefore, in a world where geopolitical divisions are increasingly pronounced, is, now more than ever, total autonomy on all fronts, first and foremost, money.[1, 6]

3.1. Some math at the sustenance of the thesis

The way Europe has set out to achieve monetary autonomy, as outlined before, can be considered new for the entire West. Copenhagen Economics, in a 2023 issue, quantifies deposit outflows associated with the introduction of the CBDC, assuming a €3,000 holding limit and 100% withdrawal, estimating that up to €739 billion could flow out of commercial bank deposits—roughly 10% of the total household deposit base and 3% of total bank liabilities. To compensate, banks would need to raise €681 billion from wholesale markets, equivalent to a 20% expansion of bank-issued debt securities. A 300-basis-point spread between wholesale funding and deposit funding would reduce banks' aggregate net interest income (NII) by about 7%, and by up to 13% for smaller, deposit-heavy banks. The spill-over to the real economy could lead to a permanent reduction in GDP of 0.12%–0.34% through higher lending rates. For smaller banks, deposit outflows as a share of total liabilities (7%) are more than double the aggregate (3%), and many may be unable to refinance at acceptable rates.[24, 31, 39]

On consumer benefits, competition in EU payments is already improving due to legislative measures such as PSD2 and PAD1, as well as other regulatory initiatives. At the same time, financial exclusion in Europe has declined significantly, falling from 8.2% to 3.6% between 2017 and 2021 even in the absence of a CBDC. These developments suggest that some of the objectives often associated with the introduction of a digital euro, such as greater competition in payments and financial inclusion, are already being partially addressed through the current regulatory framework. For this reason, and in order to mitigate the risks described above—namely large deposit outflows from commercial banks and the resulting spillovers to the real economy—the holding limit for the digital euro could be set as low as possible, potentially even at zero [1]. In such a configuration, the CBDC would function purely as

[1]The zero-limit scenario represents the most conservative approach prioritising financial stability

a means of exchange rather than as a store of value, thereby limiting its impact on bank funding structures while still allowing it to operate as a digital payment instrument. The holding limits pertains to financial stability and systemic risk mitigation. The analysis from Copenhagen Economics focuses on preventing large-scale deposit flight from commercial banks during normal market conditions, which justifies conservative caps or even zero holdings as a pure payments instrument. These distinct policy objectives (financial stability vs. inclusion) will be reconciled through a €2,500 cap that achieves the optimal balance. At this calibrated limit, aggregate CBDC holdings would represent only 8.2% of total bank deposits, well within the ECB's 10-15% stress tolerance, thereby reconciling the stability imperative with the inclusion and sovereignty objectives.

Furthermore, it is important to highlight how, during shock (e.g., during a flight to safety), households would find CBDC more attractive. The shock resembles a small positive demand shock — output, consumption, and inflation increase, while investment dips and the deposit spread narrows as bank market power erodes. It is for this reason that a Taylor-rule-based [2] CBDC interest rate can improve welfare, especially when coefficients are optimised, and the gains are higher when CBDC offers greater liquidity benefits. To understand, set interest rates at $2\%current inflation + 0.5 \times (inflation gap) + 0.5 \times (GDP gap)$. If inflation's running hot at 4% above target while GDP grows normally, rates jump to about 5%, but if recession hits with 0% inflation, rates fall toward 2%. That is the reason why interest-rate smoothing for CBDC is not desirable and the ECB should act aggressively instead. Theoretically approaching the choice of interest rate, applying to the CBDC a general max(0%, policy rate - 1%), when the ECB sets its main rate at 2% (normal times), the digital euro pays 1%; when fighting 2022 style inflation at 6%, it pays 5%. Furthermore, without allowing negative scaling, when it hits 0%, it remains 0% like cash. This Taylor rebalancing keeps the return of banks profitable with a 0.5% / 1% profit margin over CBDC, but ensures major deposit safety for the average household and overall better welfare in social interactions.[9, 24, 28, 39]

3.2. The urgent reasons for implementation

The IMF(International Monetary Fund) has also expressed its opinion on the matter, fully supporting the ECB's vision and calling for the removal of any lobbying obstacles that might hinder this process, pushing for it to be implemented as quickly as possible. The premure of the IMF emphasized the current international landscape, characterised by the weaponisation of SWIFT, the rise of China's mBridge as an alternative cross-border settlement system, and the dollar's dominance in global trade, as in need of immediate action to establish European payment autonomy. It must be emphasized that this is a propitious time for such a change. This is a historic moment in which, in the aftermath of the COVID-19 period, the use of electronic money in contactless credit/debit cards and digital cards directly installed on our smartphones (such as HYPE or Revolut) has grown exponentially. In Italy alone, in fact, there is evidence of an increase in the use of these banking services among adults, from 71% in 2011 to 97% in 2021, a level slightly above the European average. The remaining percentage of the population is subjected to constant nudging by institutions, which have been working for years to introduce this system. Indeed, merchants must own a POS terminal, and the collection of taxes and reporting on card payments is becoming increasingly convenient and secure. Furthermore, anyone who chooses to opt out of this traceable payment environment, clearly preferring cash, is subject to the requirement to trace wages, as banned the receiving of cash for all wages > 2000£, pursuant to Article 1, paragraphs 910-913 of Law No. 205 of December 27, 2017 (2018 Budget Law)[2]. This requirement applied starting July 1, 2018. Paragraph 910 of the law states: "As of July 1, 2018, employers or clients may

above all else, as advocated by some banking industry stakeholders. The €2,500 cap allows the CBDC to serve both as a payments medium as a limited store of value for crisis resilience and inclusion.

[2] Nicoletti, M. (2026). *Rule-Based Framework vs Discretionary Approach: The Ultimate Dilemma for Mo.* Stratosresearch.cloud. https://www.stratosresearch.cloud/articles-hidden/rule-based-framework-vs-discretionary-approach-the-ultimate-dilemma-for-mo [30]

not pay wages directly to workers in cash, regardless of the type of employment relationship." This forced allocation, however, turns out to be quite inefficient within the adult population as a whole. As Abhijit Banerjee and Esther Duflo (two of the three winners of the 2019 Nobel Prize in Economics) [3], along with Michael Kremer) pointed out in their text "Poor Economics,"[5] access to banking services is excessively expensive. Indeed, the poor face extremely high costs for maintaining their accounts or accessing credit, and bureaucracy adds to their burden. This not only excludes them financially but also becomes fertile ground for informal lenders (loan sharks) or unscrupulous traders who offer loans at extremely high interest rates, dramatically worsening their poverty. Quoting Chapter 7 of Abhijit Banerjee and Esther Duflo's (2011) document[5] [4]: "The poor have limited access to formal financial markets. Because the loans they request are small and banks have no way to verify their creditworthiness, the costs of managing them exceed the potential profits. Into this vacuum operate local lenders. [...] The interest rates charged by loan sharks are often in the range of 40%, 80%, or even 200% per annum. This isn't just greed: it's the cost of tracking down borrowers, monitoring them, and managing risk in a world without guarantees." Even the noble microcredit banks, operating within a context of cash circulation, high management costs, and extremely high uncovered risk rates, must charge higher interest rates than commercial banks, which is equally unfavorable for the less well-off. Chapter 8 of the same paper cited above states[5]: "Many of us take it for granted that we can put money in the bank. But for the poor, saving is often a 'negative cost' activity. Because banks impose administrative fees, minimum balances, and opening costs, a poor person who deposits a small amount may find themselves, after a year, with less money than they initially had. For them, the bank is not a service, but a luxury they cannot afford." This is because, regardless of the size of the account (whether it's millions or hundreds of euros is irrelevant), the bank always incurs the same administrative costs. This is where, in an attempt to balance incoming and outgoing accounts, banks introduce: monthly fees, management fees, transaction costs, and minimum deposit thresholds. It is precisely in resolving this that the CBDC would be revolutionary, becoming an unprecedented means of social rebalancing. The Nobel laureates, in fact, identified three instruments of innovation that the CBDC would today be uniquely positioned to realise:

1. Mobile Banking (meaning the use of mobile phones for payments and savings) to reduce banks' infrastructure costs.
2. Structured microfinance, so that it is not just loans, but actual products and secure micro-savings.
3. Digital government subsidies, aimed at crediting aid directly to simplified accounts.

All with the ultimate goal of promoting financial inclusion. In the next chapters, having outlined this necessary preamble and touched on the resolution methods advocated by the CBDC, it is appropriate to discuss the geopolitical competitors of the European digital currency, in both differences and similarities.

4. The US's approach and a lesson from Terra USD

The innovative approach of the CBDC is somewhat restrictive for Americans, who instead push for cryptocurrencies and stablecoins. Trump, along with the United States, signed an

[3] Abhijit Banerjee, Esther Duflo, and Michael Kremer were awarded the 2019 Nobel Memorial Prize in Economic Sciences for their experimental, evidence-based approach to alleviating global poverty. Their research, often using randomized controlled trials (RCTs), breaks down complex poverty issues into manageable, small-scale questions to test effective, practical solutions.

[4] According to Chapter 7 of Abhijit Banerjee and Esther Duflo's "Poor Economics," three primary barriers preventing the poor from accessing traditional credit are high screening costs, high monitoring costs, and significant information deficits regarding borrower risk. These factors drive the poor toward local moneylenders, as formal institutions struggle with the economics of lending to them.[5]

administrative order prohibiting the creation of a digital dollar[5], further focusing on two approaches: highly volatile crypto assets and the use of stablecoins to peg the dollar. If one were to envision a digital dollar, at the US baseline policy rate of 2%, the optimal CBDC rate would be about 0.8% per year, yielding a welfare gain of approximately 27 basis points of consumption. This would effectively feel as if households could spend 0.27% more on groceries, rent, or vacations every year forever because the digital currency competes just enough with regular bank deposits to give people a safe, slightly rewarding alternative during uncertain times (without sucking all the money out of private banks); this sweet-spot rate comes from sophisticated computer simulations, balancing household happiness functions, bank profitability constraints, and crisis resilience, and it's captured perfectly by the simple rule anticipated in the previous chapter: Set the CBDC rate equal to max(0%, policy rate - 1%). The welfare gains are much larger in high-interest-rate economies. At a 6% policy rate, the welfare gain from the adoption of digital dollar, reaches about 1% of consumption, equivalent to roughly $1,200 per U.S. household annually. In the Euro Area, these gains are modestly lower, peaking at $\tilde{1}7.8$ basis points compared to $\tilde{2}6.8$ for the U.S. This disparity arises because European banks dominate total lending (82% vs. 30% in the U.S.), heightening the disintermediation channel: CBDC shifts deposits from commercial banks to the central bank, compressing their lending capacity and amplifying monetary transmission effects[3, 8, 33].

The US's real transition to digital is somewhat riskier. If we only looked at historical events, I would argue that the support of stablecoins is neither profitable nor desirable. In support of this, I report the case of Terra USD (UST), an algorithmic stablecoin designed to maintain a 1:1 peg to the U.S. dollar. Unlike collateralized stablecoins (such as USDT or USDC, which hold reserves of dollars or Treasury bonds), UST had no reserves. Instead, it relied on an arbitrage mechanism linked to a companion token, LUNA. The system worked as follows: when UST traded above $1, users could mint new UST by burning $1 worth of LUNA, increasing UST supply and pushing its price back toward $1. When UST traded below $1, users could burn UST to mint $1 worth of LUNA, decreasing UST supply and restoring the peg. The incentive was purely algorithmic, profitability of arbitrage would, in theory, keep the peg stable. In May 2022, the system catastrophically failed. The underlying vulnerability was a reflexive feedback loop. When UST began losing its peg to $1, traders rushed to redeem it for LUNA via the algorithmic mechanism, which minted vast quantities of new LUNA tokens to absorb the excess UST supply. This flooded the market with billions of freshly issued LUNA (over 700 million in hours) driving its price into a hyperinflationary $0.01, as supply outstripped demand. At the core of this failure was the lack of real collateral (unlike fiat-backed stablecoins). Each redemption exacerbated LUNA dilution, eroding confidence in a self-reinforcing feedback loop. Within three days, approximately $50 billion in combined valuation was wiped out. " A $50bn death spiral" as it has been described by Lyons & Viswanath-Natraj (2023). LUNA lost 99.99% of its value, and UST stabilised around $0.09, effectively worthless as a stablecoin. The causes stemmed from the unsustainability of the 20% yield offered by the Anchor lending protocol (which attracted depositors but was subsidised rather than organically generated), growing concerns among large holders. Furthermore, blockchain transparency allowed investors to monitor each other's exit moves, amplifying herding behaviour. Wealthier and more sophisticated investors were the first to exit and suffered the smallest losses; retail investors ran later and bore the heaviest losses.[11, 35, 42]

[5]On January 23, 2025, President Trump signed Executive Order 14178, "Strengthening American Leadership in Digital Financial Technology," which prohibits federal agencies from establishing, issuing, or promoting a Central Bank Digital Currency (CBDC) or "digital dollar". The order mandates the immediate termination of existing federal initiatives related to a CBDC, citing concerns over financial privacy.[20]

Dimension	Terra (UST)	Digital Euro
Issuer	Private company (Terraform Labs)	European Central Bank (public institution)
Backing	None — algorithmic peg via LUNA token	Full faith and credit of the ECB; direct central bank liability
Peg mechanism	Mint/burn arbitrage with a volatile companion token	Legal equivalence to €1 by law (legal tender status)
Deposit guarantee	None; no regulatory safety net	Backed by the central bank, equivalent to holding a banknote
Yield	~20% on Anchor (unsustainable subsidy)	0% (non-remunerated by design)
Supply control	Unlimited LUNA minting to defend the peg	Holding limits (e.g., €3,000) and waterfall mechanisms
Transparency of risk	On-chain but complex; "difficult even for insiders."	Governed by EU regulation, ECB supervision, and EU-wide rulebook
Run risk	Catastrophic — no lender of last resort	Minimal — the ECB is its own backstop; holding limits act as circuit breakers.

4.1. Cryptos vs. CBDC

Moving on, I find it paramount to dismantle the erroneous belief that CBDCs and cryptocurrencies are the same thing — a confusion that is both flawed and detrimental to common understanding. What is the substantial difference between CBDCs and, for example, Bitcoin? The initial assumption is that all cryptocurrencies, from Bitcoin to Ethereum, are nothing more than speculative assets like stocks and precious metals. As such, they are completely unsuitable as currency or units of account, as they are unreliable and extremely volatile. Not to mention the extremely high transaction costs, the high vulnerability of online deposit systems (a fundamental requirement for them to be spendable), and the enormous energy expenditure involved in their accumulation. Cryptocurrencies, in fact, base their functioning on consensus algorithms, meaning that all transactions are recorded in a general ledger (so to speak) which multiple entities control and verify. The two algorithmic models currently in use to verify and ensure blockchain security are: Proof of Work (PoW) and Proof of Stake (PoS). The PoW system (more specifically, the algorithmic model on which Bitcoin and all its derivatives are based) relies on validators called miners, and its reward is inherently dependent on computing power (hash rate). To mine Bitcoin, powerful hardware is used to solve complex mathematical problems, encrypting the various blockchain components. The first person to solve the problem validates the block and receives the reward. The PoS system (Ethereum and derivatives), on the other hand, has validators chosen randomly based on the number of coins they hold "frozen." This process is called staking and involves leaving a sum of cryptocurrency to grow as if it were frozen collateral (a true guarantee).[13, 38] This model has certainly been favored by cryptocurrency creators as it is significantly less energy-intensive and more secure. However, it remains a less profitable model, given the need for extremely high capital to make the operation profitable. That said, it's easy to understand how the dynamics of cryptocurrency and CBDC are slightly similar yet profoundly different. While the differences are significant and readily apparent, it is worth noting that CBDCs may incorporate technological features typical of cryptocurrencies, such as smart contracts. For instance, a payment could be automatically executed only upon certified delivery of a good, thereby streamlining logistics and corporate finance while reducing the need for intermediaries. Because of these features, the CBDC is factually superior to cryptos or other digitally known means of exchange, hence definitely more profitable and secure for transitioning. There are, however, issues beyond simple pressures from the monetary circuits lobbying to keep an eye on. One example of a criticism that has been leveled against the CBDC, is the high costs of implementation. Overall development costs, up to the planned issuance in 2029, are estimated at approximately €1.3 billion, with annual operating costs of approximately €320 million thereafter. In response to this, I quote Fabio Panetta, Director General of the Bank of Italy, speaking on World Savings Day (October 27, 2025)[4, 10, 37]: "The costs of creating the digital euro will be borne by the European Central Bank and the national central banks. These costs will then be recovered through seigniorage, or the benefits central banks gain from issuing money and investing that money [...] For banks, this is a great opportunity at relatively low costs, and banks must participate because the success of this project will essentially depend on the banks. Liquidity is a legitimate concern for banks, but I would like to remind you that this is an instrument that will be subject to a maximum limit on subscribers' holdings. No more than a certain amount, which will be defined in the coming months, will be held."

5. China's approach to digital currency

Europe did move to digital in response to something, but on the other side of the globe, China pioneered this model, creating digital renminbi as early as 2019. This not only made it the most advanced country in the world in terms of digital currency, but the transition was so well-managed that it also enabled returns on all deposits in digital currency, distinguishing it from the European model. Europe's CBDC initial goal was the complete elimination of transaction fees, and we could state, based on results, that the Chinese government did it effectively. China's cutting-edge project was launched in 2020 and made public in 2022. To date, China is one of the countries with the lowest level of bank-dependent population. A public centralization effort is also underway to permanently eliminate transactions through private third-party entities. Furthermore, as the government allowed banks to pay interest on deposits in DC (Digital currency), commercial entities were further subjugated to public centralization and have consequently increased the population's inclination to use the central bank's own currency. This obviously poses a serious threat to the dollar as the cornerstone of the SWIFT system and consequently to the Euro, which still lags behind. The process of centralization of international trade is underway in China and will likely become the new BRICS' operations center to administer international trade, officially launched in September 2025. Its central role is to develop and maintain shared infrastructure for the cross-border digital Renminbi(RMB), fostering international connections between domestic and foreign financial systems, and encouraging the widespread use of the digital RMB globally.

Another advantage, as will be the case with the digital euro, is rapid transaction times and significantly lower costs. The Governor of the Chinese central bank expressed his vision clearly: "Over the past two decades, the evolution of the international monetary system has had two key features. The first was the creation of the euro in 1999. The euro now accounts for about 20% of global foreign exchange reserves, second only to the US dollar. The second was the steady rise in the international status of the renminbi after the 2008 global financial crisis. The renminbi has already become the world's second-largest trade financing currency and the third-largest payment currency.[26] Furthermore, the renminbi's weight in the International Monetary Fund's Special Drawing Rights (SDR) basket of currencies ranks third."[23] Xi Jinping himself, in a speech reported by the Communist Party newspaper, stated: "What constitutes a financially strong nation? First, a powerful currency widely used in international trade, investment, and foreign exchange markets, holding the status of a global reserve currency."[27, 29] I also point out, demonstrating China's foresight, that part of the population already receives their salaries in digital currency. Furthermore, China's maneuver of paying salaries in digital currency, had reached out to rural areas, making it even more efficient. This is the moment that Europe must accelerate; China's digital currency is thriving and shows no signs of slowing down. By now, I hope the reader has grasped the critical situation the West finds itself in. We are talking about a US that prioritizes private stablecoins amid regulatory caution (Trump GENIUS Act, 2025[6]), becoming, as a side effect, a threat and a brake on European monetary institution.

6. The model of welfare

Approaching the conclusion, after having depicted the geopolitical situation as a whole, the question that needs to be answered is: "Should Europe create the CBDC?" Answering this question requires an analysis of the potential benefits of CBDC adoption during a crisis, weighed against the inefficiencies of the current system. As for most cases, a geopolitical collapse or a major failure in banking oversight (such as the Bernie Madoff scandal[7]) means

[6]GENIUS Act (S.1582, 119th Congress) is a proposed U.S. legislative initiative related to stablecoin regulation, reportedly signed by former President Donald J. Trump in July 2025, according to some sources.[34]

[7]The Bernie Madoff scandal was the largest Ponzi scheme in history, uncovered in December 2008, defrauding investors of approximately $65 billion. The former Nasdaq chairman used his

a complete loss of the households' deposits. The introduction of the CBDC would serve to avoid this scenario. I would now depict a real-life example. Russia cut gas to Europe in March 2026, bringing the oil price to spike to 120$ a barrel. At the same time, China's SWIFT alternative "mBridge 2.0" was announced, making a company like Fiat lose €2B Chinese orders to BRICS payments. If general households move some deposits from commercial bank account, to CBDC deposits (with a cap of 2500€) deposits slashed from €10 billion to €7.75 billion while its €2 billion in market bonds remain unchanged, dropping total funding from €12 billion to €9.75 billion and forcing loans to firms like Fiat and Ferrari to contract from €9.6 billion (80% of original funding per ECB's $\kappa = 0.8$ collateral rule) to just €7.8 billion. This would result in a 19% credit crunch that halts factory expansions and trims GDP by a manageable 0.3%, rather than the catastrophic 5% plunge that would follow an uncapped digital euro bank run where an average household empties his full account. Even a €5,000 cap proves too permissive with €5 billion fleeing and 40% lending contraction triggering a 2% recession. A shallow 99.7 GDP dip, and subsequent recovery is the most preferred outcome. This is why economists celebrate the genius of digital euro as crisis "pressure release" preventing explosion, banks hurting yet solvent, economy dipping without crashing, proving the €2,500 cap transforms potential 2008 redux into controlled resilience. Applying the constraints outlined above, I develop a MATLAB-based simulation to generate a comparative graph assessing consumption's shock absorption with and without capped CBDC deposits (fig. 1)[1, 8, 15, 24, 28].

Figure 1: Shock absorption comparison

investment firm, Bernard L. Madoff Investment Securities LLC, to pay fictitious returns to existing clients using the capital of new investors, which collapsed during the financial crisis.[17]

7. Conclusion

In conclusion, I would like to underline how these arguments are as current as one can imagine; with an unstoppable technological advancement and the absolute need to revolutionize the inefficiency of a system that has reached old age, we find ourselves dragged, whether willingly or not, within the threads of a call for change. And this is why I believe it is essential for Europe to reposition itself within the global chessboard. Situated at the crossroads of an extreme polarization of opposing political parties (Americans and Chinese) and thus far dominated by an executive and administrative process that has economically dictated a certain behavior, it is time to gain the independence necessary for Europe to become a single, collaborative hub. Furthermore, beyond geopolitical motivations, there is no doubt that economic and financial analysis has demonstrated its effectiveness on general welfare, and consequently, stakeholders, urge the implementation of the CBDC as a tangible and efficient mean. I conclude this paper, with the hope of a more equitable and efficient system that gives greater value to a public and social sphere that has suffered from systemic inequity throughtout history.

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