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Hayekian Hurdles: Challenges to Cryptocurrency as a Viable Basis for a New Monetary Order

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Abstract: The rise of cryptocurrencies over the past decade has promised to challenge the dominance of fiat money systems and reshape monetary policy. However, recent developments, including market volatility and the collapse of key exchanges like FTX, have eroded public trust, raising skepticism of a feasible transition to a crypto-based monetary system. This paper explores why cryptocurrencies have not met the expectations of their proponents, particularly those who saw them as a step towards Friedrich Hayek's vision for competitive currency issuance. While cryptocurrencies reflect some aspects of Hayek's model, their instability—especially in Bitcoin-like assets—undermines their role as a reliable alternative to fiat money. The paper also considers how central bank independence and regulatory gaps further hinder the development of a robust cryptocurrency framework. Despite the continued relevance of Hayek's ideas in today's monetary landscape, the entrenched structures of modern central banks and the rise of Central Bank Digital Currencies suggest that a decentralised currency order remains unlikely in the near future.

Keywords: cryptocurrencies; Hayek; currency competition; currency adoption; monetary evolution

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1. Introduction

In recent years, the landscape of money creation and monetary policy appears to be undergoing one of the most significant changes since the widespread adoption of fiat money regimes. Cryptocurrencies have grown in importance both in the portfolios of individuals and in the minds of policy-makers, emerging as a challenge to extant institutions (Adrian & Mancini-Griffoli, 2019). However, despite early optimism, recent developments—including sharp movements in market value and the collapse of major exchanges like FTX—have led to diminished public trust, affecting discussions around the role of digital currencies in the monetary system (The Economist, 2023).

This article positions the development of cryptocurrencies within the broader history of money, exploring why they have not met the expectations of their proponents, particularly those who saw them as a possible realisation of Friedrich Hayek's vision for monetary competition in his influential 1976 *Denationalisation of Money* (Hayek, 1990). In this work, Hayek questioned whether monetary policy should remain a governmental monopoly, proposing an alternative system where private banks also compete by issuing currencies. While many of his contemporaries deemed this vision utopian, his ideas have been brought to the fore when analysing the emergence of cryptocurrencies (Bas, 2020). We find that, while these assets embody some aspects of Hayek's vision—namely being a decentralised alternative to government-issued money—, their current form—particularly Bitcoin-like

assets—suffers from a level of volatility that undermines their role as a stable alternative to fulfilling the traditional functions of money as a store of value, a medium of exchange, and a unit of account. Still, we find that alternatives like stablecoins are more promising.

Furthermore, we also discuss the challenges posed by central bank independence and the regulatory milieu, which hinder the development of a robust cryptocurrency framework. As central banks continue to expand their discretionary roles, we find that Hayek's ideas remain relevant, but the entrenched structures of modern monetary systems suggest that a decentralised currency order is unlikely in the near future.

This article is structured as follows. First, we clarify our research questions and our methodological strategy. Second, we provide an overview of the historical and institutional context of state-issued money, highlighting the main institutional and technological changes that shape our modern understanding of it. We then delve into Hayek's (1990) proposal for a competitive monetary issuance system and its links to cryptocurrencies. We then present arguments outlining why his proposal, in its cryptographic form, appears impractical. Finally, we conclude by synthesising the findings and discussing the broader implications of this research.

2. Research Questions and Methodological Strategy

This article offers a theoretical reflection, grounded in the literature and supported by a selection of empirical observations, aiming to illuminate the contemporary relevance of F. A. Hayek's proposal for a private, competitive currency issuance system. It specifically addresses the following main questions:

1. Do current cryptocurrency markets dovetail with Hayek's original vision for competitive private currencies?

2. To what extent do existing cryptocurrencies meet—or promise to meet—Hayek's criteria for stable, competitive currencies?

3. How have institutional developments since Hayek's time—such as the development of central bank independence and ancillary regulatory frameworks—affected the relevance of his proposals?

4. Is a generally accepted, decentralised, competitive currency issuance system more feasible today than in Hayek's day?

To address these questions, our analytical foundation is Hayek's *Denationalisation of Money*. This work articulates a conceptual framework relating currency adoption and competitiveness to attributes like purchasing power stability. This framework is extended and enriched by situating the rise of cryptocurrencies in the history of currencies and by engaging with recent theoretical and empirical literature, especially illuminating the real-world attributes of digital currencies, like their volatility, barriers to adoption, and the present regulatory landscape.

The analysis applies this enriched framework to critically examine present-day digital currencies, including Bitcoin-like assets, stablecoins, or Central Bank Digital Currencies (CBDCs). While this study does not aim to develop a quantitative analysis, empirical observations are selectively included to buttress key points. For instance, we collect and analyse data on the volatility of various digital assets to underscore their limitations as stable stores of value.

3. From the Age of fiat Currencies to Cryptocurrencies

Understanding how governments have managed money throughout history is crucial to grasping the context in which cryptocurrencies have emerged and Hayek's argument. By extending this analysis beyond Hayek's time, we shed light on relevant institutional reforms and technological advancements that have taken place since the 1970s. These

developments have paved the way for the rise of cryptocurrencies, offering new possibilities and challenges for the future of monetary systems.

3.1. (State) Money Prior to the Collapse of the Bretton Woods Arrangements

It is unclear exactly when money became "the dice of politicians" (Hayek, 1999, p. 240), but there is broad consensus that the state's role in monetary policy has been a defining feature of modern economies. There is no unanimous definition of money, despite its crucial role in any modern economy (Banco de Portugal, n.d.). Ali et al. (2014) define money as "something" (p. 264) that simultaneously serves as a medium of exchange with which payments are made, a store of value that allows purchasing power to be deferred into an unknown future date, and a unit of account against which the value of other items is measured.

From at least the 13th century, European monetary authorities commonly declared coins made of precious metal—namely gold and silver—as legal tender, assigning them a specific unit of account value that was often different from their intrinsic value (Redish, 1993). By the early modern period, rulers had the power to define the unit of account and control the mint, enabling them to manipulate currency value via seigniorage. According to Redish (1993), this practice was frequent, particularly while alternative revenue sources, such as taxation, remained underdeveloped.

During the 16th century—with the emergence of goldsmith banks (Ali et al., 2014)—paper notes began to replace precious metal coins as a medium of exchange (Redish, 1993). Initially, these notes were fully backed by metal coins and acted as receipts for gold deposits that banks were entrusted with. Although not intrinsically valuable, they could be redeemed for a fixed quantity of an underlying commodity, facilitating the transfer of large sums of money without the need to physically transport heavy metals (European Central Bank, 2012).

The development of fractionally backed paper money and private note-issuing banks eventually led to the establishment of central banks, typically private institutions with a monopoly over the issuance of notes granted legal tender status (Redish, 1993). Fractional reserve banking, by reducing reserve ratios, made the banking system more efficient, but it also introduced systemic risks, prompting the emergence of central banks to stabilise the system (Redish, 1993). Ali et al. (2014) argue that central banks arose because of the intrinsic link between money and payment systems: for money to function as a medium of exchange, a system that facilitates the transfer of value (i.e., a payment system) must be in place. Additionally, a means of recording stored values (i.e., a ledger) is required if transactions are to be cleared without physically exchanging currency. Carstens et al. (2022) further this insight, stating that when economic agents make payments, they are simultaneously trusting both the money and the payment system that executes the transaction. As the number of banks increased, the need for efficiency led to the creation of a clearing bank, holding the accounts of all participating institutions (Ali et al., 2014).

Despite these advances, the monetary systems of Western economies retained some features of their earlier roots (Redish, 1993). Metal coins remained in circulation, and the convertibility of paper money into commodities like gold remained a cornerstone of monetary systems until the 20th century. The gold standard, which linked money supply to gold reserves, underpinned much of the prosperity of the Atlantic economy (Redish, 1993). Over time, the link between the money supply and anchor commodities weakened, but it remained significant. By the early 20th century, managing gold reserves became increasingly difficult, culminating in the abandonment of the gold standard during World War I, followed by its brief reinstatement in the 1920s and final collapse in the wake of 1929.

The post-World War II era saw the creation of a new international monetary order, the Bretton Woods system. Signed in 1944, the accord pegged national currencies to the United States dollar, itself convertible into gold at a fixed rate of $35 per ounce. However, this system did not last, with President Richard Nixon suspending the dollar's convertibility into gold in August 1971. This marked the definitive end of the commodity-backed monetary era and the affirmation of the fiat money system that predominates today.

3.2. A Snapshot of the Age of Fiat Currencies

Following the collapse of the Bretton Woods system, most developed nations favoured flexible exchange rates (Croce & Khan, 2000). This, inter alia, offered the opportunity to implement discretionary monetary policies (Croce & Khan, 2000). These policies allow governments to influence macroeconomic outcomes by controlling both fiscal and monetary policy instruments (Bandaogo, 2021). However, these newfound possibilities brought their own challenges, such as the time-inconsistency problem of monetary policy, often identified as an important cause of The Great Inflation of the 1970s (Bandaogo, 2021) which prompted Hayek to originally write and publish *Denationalisation of Money*. Jordan (2022) emphasises that this period provides a clear historical lesson: when central banks and fiscal authorities collaborate, monetary policy is used to—either directly or indirectly—finance deficits, leading to high inflation and concomitant consequences, like resource misallocation, as explained by Croce and Khan (2000) and Jordan (2022).

In response to inflationary pressures, many countries began to grant their central banks institutional independence starting in the mid-1980s, tasking them with maintaining price stability (Croce & Khan, 2000). Nevertheless, central banks must never overlook the effects of fiscal policy on their capacity to fulfil this mandate (Jordan, 2022). Independent central banks operate under the principles of accountability and transparency (Mersch, 2017). Accountability refers to the political duty to provide ex-post explanation and justification of autonomous decision-making and is essential to legitimise central bank activity in democratic societies. Transparency aims to enhance the effectiveness of central banks' policies by clearly communicating their objectives, behaviours, and decisions to the public.

In recent years, however, central bank independence has come under increasing scrutiny. Following the 2008 financial crisis, central banks were compelled to engage in significant discretionary and unconventional interventions with substantial distributional and fiscal implications (Palley, 2019). Moreover, in the aftermath of this crisis, central banks' powers, tasks, and responsibilities expanded beyond those traditionally associated with monetary policy (Bandaogo, 2021; Mersch, 2017). As Bandaogo (2021) notes, accountability has become more challenging because, unlike price stability—easily assessed by comparing target and recorded inflation levels —, new responsibilities, such as financial stability or environmental sustainability and gender diversity, as highlighted by Romelli (2024), are much more abstract.

The COVID-19 pandemic further intensified debates around central bank independence (Bandaogo, 2021). Prior to this event, central banks had substantially decreased short- and long-term interest rates—sometimes into negative territory—by buying government and corporate bonds, thereby increasing both their balance sheets and risk exposure (Jordan, 2022). Following the coronavirus outbreak, measures to contain the spread of the disease were implemented. These measures severely restricted business activities, inducing both fiscal and monetary responses. Social benefit schemes and stimulus packages were introduced to stabilise the economy, albeit at the cost of a substantial increase in already-high public debt. Meanwhile, central banks also sought to maintain market liquidity and avoid deflation.

It is now critical for central banks to demonstrate that their extraordinary measures during these crises were temporary and do not signal the beginning of long-term fiscal dominance over monetary policy (Jordan, 2022). In this context, Romelli (2024) analyses the evolution of central bank independence across a sample of 155 countries between 1923 and 2023. The author identifies a trend towards enhanced central bank independence, with reforms slowing after 2008 but resuming since 2016.

3.3. Money and Payment Systems in the Digital Era

Modern payment systems share fundamental similarities with those used by 16th-century goldsmiths, in that payments are still cleared by reducing the payer's balance and increasing that of the recipient's account by an equivalent amount (Ali et al., 2014). It is the technologies used to record and transfer balances between banks that are entirely different, particularly with the advent of computerisation.

Technological advancements since the mid-20th century have had a profound impact on payment systems in two key ways (Ali et al., 2014). First, records and ledgers have transitioned from paper to electronic formats, increasing the speed of completing transactions and reducing operational risks. Second, the development of low-cost digital technologies spurred the creation of new payment schemes, making payments more accessible for users.

Mobile money schemes—where money is stored as a credit on a smart card or a ledger while relying on national currencies—are just an example of these innovations (Ali et al., 2014). These schemes have been especially transformative in regions with limited traditional banking infrastructure, providing access to financial services for underserved populations. Even in developed economies, mobile money has gained traction as an alternative to traditional banking, driven by its convenience and lower costs (Ali et al., 2014).

The COVID-19 pandemic accelerated the adoption of digital and contactless payment methods as fear of physical contact and a surge in e-commerce reshaped consumer behaviour (Committee on Payment and Market Infrastructures, 2021). A 2020 study by Mastercard (2020) revealed that 79% of worldwide respondents had adopted contactless payments, with concerns over safety and cleanliness cited as key drivers. Similarly, by 2021, 64% of adults worldwide had already engaged in at least one digital payment transaction (Demirgüç-Kunt et al., 2022).

3.4. The Age of New Currency Schemes and the Crypto Ecosystem

The technological advancements of the late 20th and early 21st centuries have not only revolutionised payment systems but have also facilitated the emergence of alternative currencies and decentralised structures (Ali et al., 2014). Cryptocurrencies, as an offspring of the digital revolution, are a notable innovation in this regard (Bas, 2020). Bitcoin, proposed in 2008 by the pseudonymous Nakamoto (2008), propelled the development of blockchain technology (Alston et al., 2022) and enabled peer-to-peer transactions without the need for a trusted intermediary.

In recent years, the scope of the cryptocurrency market has expanded significantly, leading to a conceptual shift from the narrow notion of 'cryptocurrencies' to the more inclusive term of 'crypto assets' (Houben & Snyers, 2020). This reflects the complexity of the crypto ecosystem, which now encompasses a wide variety of assets with different functions. Achieving a precise consensus on terminology has proven difficult due to the diverse nature of these assets (Bas, 2020).

Still, Bas (2020) offers a classification of crypto assets into four primary categories:

- Bitcoin and Altcoins (i.e., Bitcoin-like cryptocurrencies): These are decentralised cryptocurrencies whose supply is regulated by algorithms that dictate the growth rate

of the currency. New units are typically generated through mining, a decentralised process where participants contribute computational power to validate transactions;

- Stablecoins: These cryptocurrencies aim to address the volatility seen in Bitcoin and altcoins by stabilising purchasing power. They can be subdivided into the following:

  Collateralised Stablecoins: Backed by reserves, these coins maintain a 1:1 parity with a reference asset, such as a national currency. Their value depends on the quality of the collateral and the credibility of the issuer;

  Non-Collateralised Stablecoins: These rely on algorithms that adjust supply to ensure their market price stays in line with the value of the reference asset, without underlying physical reserves;
- Tokens: These crypto assets are designed for specific functions and operate only within the platform for which they were created, as opposed to general-purpose currencies;
- Central Bank Digital Currencies (CBDCs): These are digital versions of fiat currencies, issued by central banks and representing a digital extension of traditional currency systems.

The evolution of cryptocurrencies and crypto assets is noteworthy, but it has also faced significant challenges. As shall be argued more comprehensively in subsequent sections, while Bitcoin-like cryptocurrencies were initially seen as potential alternatives to fiat money, their extreme volatility has limited their practical use as a reliable store of value or medium of exchange. Stablecoins have emerged as a possible solution to this issue, though they raise new concerns related to regulation and trust in their issuers. The path forward for crypto assets will depend on resolving issues related to, among others, scalability, regulation, and public trust. As argued next, F. A. Hayek's prescient vision for competitive private currencies offers insights on these issues.

4. The Case for a New (Monetary) World Order

Hayek's (1990) proposal advocates for private currency issuance and competition. This system aims to reduce government intervention and politicisation of monetary policy. Cryptocurrencies have been linked to the Austrian economist's vision, offering an alternative to traditional fiat currencies. However, critics argue that his proposal overlooks network effects and information costs. The relationship between Hayek's ideas and cryptocurrencies is explored in the context of monetary theory and institutional developments.

4.1. Hayek's Proposal

Friedrich A. Hayek, a Nobel Laureate in Economics, first published *Denationalisation of Money* in 1976, in the aftermath of the collapse of the Bretton Woods system and amidst a period of stagflation (Bas, 2020). Like other economists in the Austrian tradition, Hayek believed that if the management of money is in the hands of the government, the gold standard is the only satisfactory system (European Central Bank, 2012). Yet, in this work, he questions the generally yet tacitly accepted belief that a given nation must be provided by its government with its own distinct currency.

Hayek (1990) advocates for the removal of government monopolies over currency issuance, suggesting that private banks should be allowed to compete by issuing their own currencies. He believed that competition among private issuers would lead to greater monetary stability, as competitive forces would drive banks to maintain the value of their currencies, as public trust would be essential for their success. In his view, the public would choose the most stable and reliable currency, leading weaker currencies to be competed out of use. Hayek argues that such a system would not only reduce the risk of government-induced inflation but also promote individual freedom by diminishing government control over monetary policy.

Hayek's vision hinges on a self-regulating monetary system driven by competition rather than government intervention. The competition between private currencies would lead to innovations in financial management, more responsive monetary policies, and a currency system that reflects the real needs of the population.

4.2. Link to Cryptocurrencies

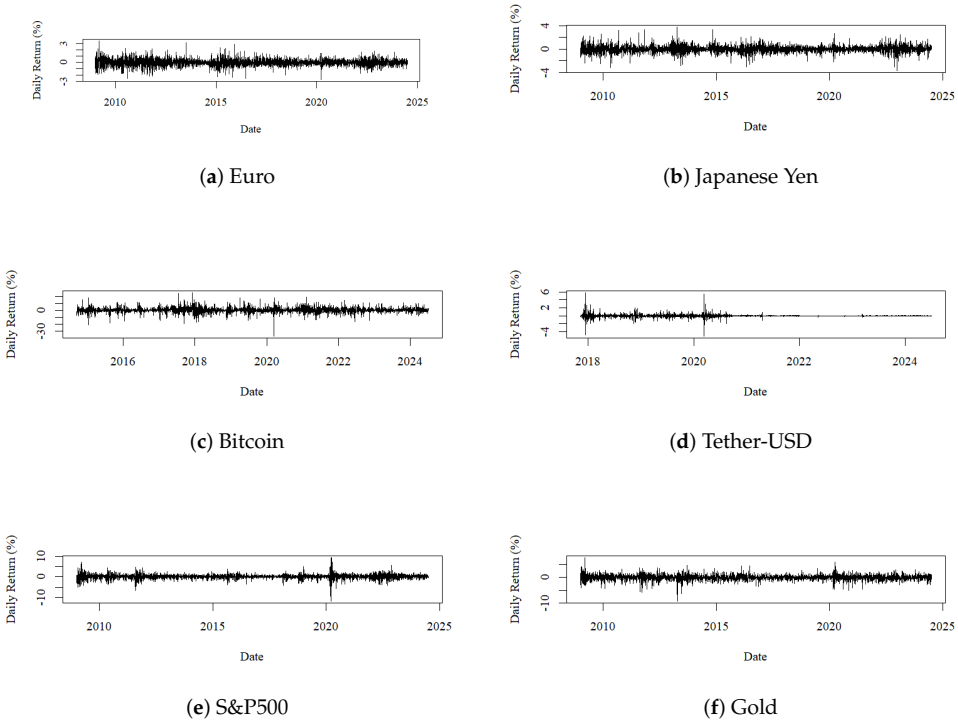
In many ways, cryptocurrencies align with Hayek's (1990) vision: they are not issued or controlled by centralised authorities, nor do they rely on official legal tender status for their acceptance (Fantacci, 2019).

Bas (2020) highlights two further noteworthy parallels between Hayek's work and the nature of cryptocurrencies. Firstly, the design of most cryptocurrencies incorporates monetary rules that operate independently of political or arbitrary influences, thus avoiding discretionary policies common in fiat systems. This mirrors Hayek's desire for a currency system governed by transparent and predictable rules rather than by government interference, which he believed to risk inflation and economic instability. Secondly, both Hayek's theoretical framework and cryptocurrencies shift the focus away from the credibility of a central issuer, which is essential in fiat systems, to alternative mechanisms of trust and value. Further connections between Hayek's (1990) proposal and cryptocurrencies can be seen in the way the latter can bypass state control over payment systems and capital movements (Fantacci, 2019).

Still, Hayek's vision and the current ecology of crypto assets are far from perfectly aligned. As Mayer and Bofinger (2024) highlight, in Hayek's (1990) vision issuers would regulate issuance relative to a reference asset, akin to how central or commercial banks manage foreign exchange reserves. This is most closely reflected in the operation of stablecoins, which, as mentioned, maintain a stable value by pegging their issuance to a reserve asset like fiat money, even if being pegged to such an asset might be, of itself, an important deviation from Hayek's (1990) fundamental vision (Mayer & Bofinger, 2024).[1] In contrast, unpegged Bitcoin-like currencies are not tied to any underlying asset or reference value at all, making their value, in practice, much more highly volatile. This volatility has been the rule rather than the exception, as demonstrated in Figure 1 and Table 1[2]. As Alonso et al. (2024) show, the behaviour of Bitcoin resembles major historical asset bubbles, particularly the Tulip Mania (1634–1637) and, to a lesser extent, the Mississippi Company Bubble (1719–1720). Their failure to gain widespread acceptance as currencies could perhaps be seen as evidence of Hayek's (1990) premise that purchasing power stability is crucial for the public acceptance of private currencies. In any case, some scholars see Bitcoin and similar cryptocurrencies as better aligned with Milton Friedman's vision of a fixed supply of currency distributed without concern for market fluctuations[3], rather than with Hayek's competitive private currency system (Ametrano, 2016; Bas, 2020).

Table 1. Descriptive statistics of daily returns.

	SP500	Gold	Euro	Yen	Bitcoin	Tether
Mean Return	0.052	0.032	−0.005	0.016	0.205	0.000
Volatility	1.142	1.034	0.559	0.592	3.661	0.395
Min	−11.984	−9.354	−2.775	−3.725	−37.170	−5.121
Max	9.383	7.832	3.459	3.820	25.247	5.824
Median	0.070	0.040	0.000	0.023	0.136	−0.001
Skewness	−0.383	−0.310	0.013	0.011	−0.130	1.169
Kurtosis	13.635	8.531	5.235	6.592	10.532	63.823



(**a**) Euro (**b**) Japanese Yen

(**c**) Bitcoin (**d**) Tether-USD

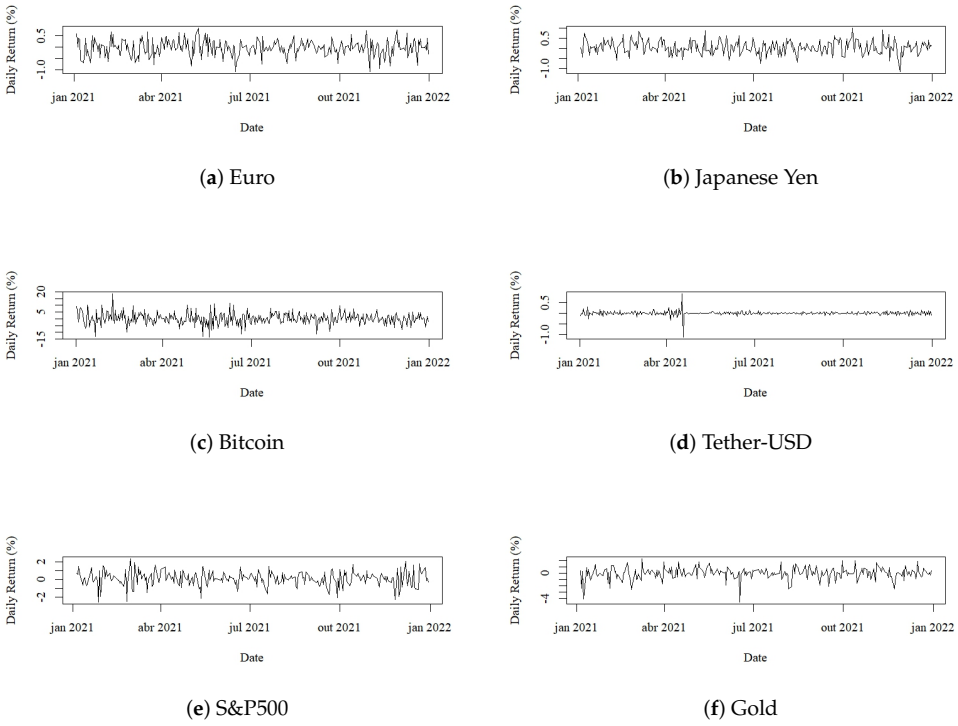
(**e**) S&P500 (**f**) Gold

Figure 1. Daily returns (%) of assets.

Mayer and Bofinger (2024) suggest that a distinction must be made between Hayekian banknotes—which are physical and exchanged peer-to-peer—and bank accounts—which are digital and transferred via a centralised accounting system. In terms of convertibility requirements, Hayek's (1990) stance is somewhat unclear. If he envisioned convertibility into national currencies or other underlying assets, then bank accounts under his system would resemble traditional bank accounts, and their digital equivalent could be embodied through stablecoins. If, however, Hayek did not intend to require legal convertibility, then unpegged cryptocurrencies, aside from their accounting mechanism, could also be classified as Hayekian money.

Stablecoins replace trust in a monopolistic issuer with a competitive process that promotes mutual oversight among different issuers, whether public or private. Stablecoins incorporate the most appealing features of Bitcoin and altcoins—such as anonymous, fast, and low-cost transfers—while mitigating their inherent volatility (Bas, 2020). It is worth highlighting that Figure 1, panel (d), illustrates the stabilisation process described by Hayek. Tether's value—measured in US dollars—has, after an initial period of evident volatility, become relatively stable in recent years. This is confirmed by the data displayed in Table 1, where Tether emerges as the least volatile of the assets considered. This is further advanced in Figure 2 and Table 2, where we zoom in on one of the Bitcoin bubbles identified by Alonso et al. (2024)—2021, the only year where we have information for the whole year for all six assets considered in our original dataset. Once again, Tether emerges as the least volatile of the assets considered, highlighting its relative advantage as a store of purchasing power. By being pegged to the United States dollar, Tether supports Bas's (2022) argument that adopting a state fiat currency was a good business decision until mid-2021, as it benefited from the significant network effects provided by these currencies. It would likely continue to be advantageous if the inflationary pressures that emerged afterwards remain controlled. Bas (2020, 2022) stresses the differences between collateralised and non-collateralised stablecoins, concluding that while the former closely mirror Hayek's

(1990) idea of private currencies, the latter struggle to provide users with consistent value over time.



(**a**) Euro (**b**) Japanese Yen

(**c**) Bitcoin (**d**) Tether-USD

(**e**) S&P500 (**f**) Gold

Figure 2. Daily returns (%) of assets (2021).

Table 2. Descriptive statistics of daily returns (2021).

	SP500	Gold	Euro	Yen	Bitcoin	Tether
Mean Return	0.106	−0.024	−0.027	0.042	0.214	−0.000
Volatility	0.822	0.925	0.349	0.328	4.214	0.103
Min	−2.568	−4.609	−1.086	−1.173	−13.766	−1.130
Max	2.379	2.319	0.850	0.996	18.746	0.916
Median	0.137	0.042	−0.016	0.042	0.104	−0.003
Skewness	−0.344	−0.992	−0.267	−0.009	0.115	−1.659
Kurtosis	3.704	6.632	3.180	3.254	4.513	59.054

In sum, while cryptocurrencies broadly reflect the essence of Hayek's (1990) vision by offering a decentralised alternative to government-issued money, their real-world application reveals significant deviations. Bitcoin-like assets, with their fixed supply and volatility, function more as speculative investments than as stable currencies. In contrast, stablecoins, particularly collateralised ones, align more closely with Hayek's concept of competitive private currencies, though even they face challenges in delivering the kind of purchasing power stability he deemed essential for the public acceptance of private money.

4.3. Monetary Theory, Network Effect and Cryptocurrency Adoption

As has been highlighted, there is no single, universally accepted definition of money (Banco de Portugal, n.d.). Money, as a social and economic tool, has evolved over time to meet changing needs (European Central Bank, 2012). The origins of money are central to the Austrian tradition, to Hayek's (1990, 1999) work and reasoning in particular.

Hayek's (1990) perspective was heavily influenced by the teachings of Menger (1892), who argued that money emerged and evolved spontaneously. Menger believed that highly liquid goods would become accepted as a medium of exchange, facilitating transactions

and obviating the need for barter (Peneder, 2022). Alchian (1977), on the other hand, introduced an alternative, albeit complementary, perspective, arguing that money emerges as a medium of exchange by alleviating imperfect knowledge. For this author, money simplifies exchange, especially when individuals have varying expertise in assessing goods. Baird (2000) points out that while Menger assumed positive costs for finding trading partners (network effects) but zero costs for identifying goods, Alchian took the opposite approach. In reality, both sets of costs are positive, and therefore the two perspectives provide a more complete understanding of how money emerges and functions in society.

These considerations are crucial for understanding two weaknesses in Hayek's (1990) proposal, as highlighted by Bas (2020). First, Hayek's theory underestimates the importance of network effects and money-related information costs. Hayek's (1990) work presupposes a 'suitable' institutional framework allowing money users to easily switch among currencies, which should happen in the face of changes in their purchasing power, even those of a minor scale. Yet, Bas (2020) argues that the public has a greater tolerance to inflation than what is assumed in *Denationalisation of Money*.[4] Money tends to function as a natural monopoly within a given area, allowing currency issuers to benefit from seigniorage for extended periods before users consider switching to alternative currencies.

Second, Hayek (1990) assumes that private currencies would outperform state-issued fiat money in maintaining purchasing power (Bas, 2020). He believes that government-issued currencies would quickly lose favour once competitive, privately issued currencies were introduced in an adequate legislative framework. However, Bas (2020) challenges Hayek's claims on three grounds. First, state-issued currencies are necessary to pay taxes, which ensures a stable base level of demand for these currencies. Second, the institutional frameworks that have evolved in developed countries often provide central banks with the incentives and tools that maintain currency stability, as can be attested by analysing the low inflation rates in many advanced economies since the 1990s. Third, according to Bas (2020), Hayek's (1990) *Denationalisation of Money* disregards global institutions, such as the International Monetary Fund, which can provide countries with "sufficient financing to defend their state currencies if needed" (Bas, 2020, p. 17).

Relatedly, Peneder (2022) adds a further critique by highlighting how classical and neoclassical monetary theory overemphasises money's role as a medium of exchange function, along with critiquing the intrinsic characteristics of money. He traces monetary thought back to Ancient Greece, where rudimentary reasoning about the substance and functions of money began. Peneder (2022) credits Schumpeter for distinguishing two main schools of thought: the Platonic, which considers money a symbolic means to facilitate exchange, and the Aristotelian, which views metal coins as an evolved commodity with intrinsic value. Menger's (1892) theory is rooted in the Aristotelian tradition, albeit with elements of both, focusing on money as a medium of exchange.

Peneder (2022) urges economists to move beyond these traditional views, particularly in the context of digital currencies. He draws on Menger's disciple, Wieser, and on Schumpeter to suggest that digitalisation enhances the immaterial functions of money, such as its role as a standard of value and a social technology of account, absorbing its traditional role as a medium of exchange. From this perspective, cryptocurrencies demonstrate the feasibility of a competitive currency system, as envisioned by Hayek. The question, however, is begged of whether intense competition among them can be sustained in the long term, especially given the growing influence of major digital platforms (Peneder, 2022).

Mayer and Bofinger (2024), in their turn, note that cryptocurrencies compete across monetary functions, including as speculative stores of value—an unconventional function of money—and as a medium of exchange—a conventional function of money—, although Hayek (1990) regarded the latter as the only serious function of money. These authors

point out that there is robust competition among unpegged cryptocurrencies, namely for speculative investment purposes and among stablecoins, as a store of value. Yet, a true competitive dynamic is lacking for money's function as a medium of exchange, mostly due to network effects and the emergence of monopolistic tendencies in the market, as previously mentioned.

Ultimately, even in the digital age, money is not purely the product of a spontaneous order but is shaped by deliberate decisions, including regulatory ones regarding private cryptocurrencies (Peneder, 2022). Alston et al. (2022) emphasise permissionless blockchains as a form of governance in the digital realm. Institutions are shaped by internal factors, such as protocol design and collective-choice processes, as well as by external pressures, such as competition from other cryptocurrencies. As cryptocurrencies continue to grow in value and influence, the role of network effects and power dynamics will become increasingly important in shaping the future of these assets. Although competition should theoretically limit monopolistic tendencies, network effects could dominate, leading to the concentration of power in the hands of a few dominant digital platforms.

5. Cryptocurrencies and the Roadblocks to Hayek's Ideal

While Hayek's proposal envisioned a competitive landscape of privately issued currencies that would foster stability and trust, cryptocurrencies face technical, social, and regulatory barriers that complicate their broader adoption. In this section, we explore these challenges, and connect them to Hayek's (1990) *Denationalisation of Money* and other literature.

5.1. Complexity and Sociodemographic Challenges in the Adoption of Competitive Currencies

Hayek (1990) suggested that the transition to a competitive currency issue system could occur relatively smoothly, with new currencies seamlessly integrated into everyday life without disrupting existing monetary practices. As mentioned, he envisioned that individuals would naturally switch to the most stable and reliable currency as competition forced issuers to maintain the purchasing power of their currencies. His vision rightly anticipated some of the technological advancements essential for this transition, such as interconnected systems enabling sellers to effortlessly convert prices across different currencies. However, the present day cryptocurrency landscape has added complexities that Hayek could not have fully predicted but that may hinder widespread adoption.

Technological challenges, particularly in the realm of cryptocurrencies, present notable hurdles. Alshamsi and Andras (2019) explored Bitcoin—back when it was primarily used as a digital currency rather than an investment tool—and found that user adoption was heavily influenced by usability and security issues, such as difficulty in locating key functions (e.g., transaction addresses and security settings) and the possibility of longer transaction processing times compared to traditional methods like credit and debit cards. Their findings revealed, for instance, that over 26% of Bitcoin users in their sample were unable to locate their receiving address, highlighting usability challenges to widespread adoption. Campino and Yang (2024) also argue that the complexities involved in transferring value through cryptocurrency, including transaction difficulties, lack of knowledge, and potential for scams, act as a deterrent to its adoption as a method of payment.

Alongside these technological challenges, demographic factors also play a role in cryptocurrency adoption. According to the United Nations (2023), global demographics are shifting, with ageing populations in both developed and developing regions. Older adults, while increasingly willing to engage with new technologies, face unique challenges due to limited exposure and a lack of early-life digital immersion (Neves & Mead, 2021). Nevertheless, while age is an important factor, familiarity, generational experiences, and

training also influence how older adults experience and adopt new technologies (Neves & Mead, 2021).

The younger population, by contrast, shows higher rates of cryptocurrency adoption. According to a study by Triple-A (2023), nearly 72% of users are under the age of 34. This could reflect younger generations' greater familiarity with digital environments and their readiness to adopt new financial technologies. Education also plays a role, as approximately 71% of users hold at least a bachelor's degree (Triple-A, 2023). These findings suggest that early exposure to digital systems and formal education facilitate the adoption of complex technologies, such as cryptocurrencies.

Given these technological and demographic factors, the transition to a competitive, cryptocurrency-based system appears far more complex than Hayek envisioned. While Hayek's competitive currency framework emphasised structural flexibility, the modern crypto ecosystem presents unique challenges and adaptations that act as barriers to entry. For cryptocurrencies to fulfil their potential, supportive policies and incentives must address the technological and demographic divides that hinder adoption and foster more inclusive access to emerging financial tools (Neves & Mead, 2021).

5.2. Crypto-Specific Market Features and the Legal Void

In addition to the technological and demographic challenges, there are unique features of the cryptocurrency market that must be considered in relation to Hayek's (1990) proposal for competitive currencies. One major concern is that cryptocurrency markets are prone to monopolistic tendencies through network effects. This is particularly noteworthy in the case of major digital platforms, which extend their reach into multisided virtual marketplaces that include digital payments and currencies (Peneder, 2022). Understanding the factors that shape user choices within these ecosystems is crucial.

Popularity, as Campino and Yang (2024) observe, frequently overshadows cryptocurrencies' intrinsic qualities, such as transaction costs, speed, or technological features.[5] For many users, the popularity of a cryptocurrency simplifies decision-making, as crowds signal high liquidity, an attractive feature for trading.

Regulation, or lack thereof, also affects adoption. Cryptocurrency markets operate in a legal grey area in many jurisdictions, and the absence of clear regulation has created significant uncertainty. Alshamsi and Andras (2019) found that persistent ambiguity regarding the legal status of cryptocurrencies continues to undermine perceptions of their security. Effective regulation could foster broader cryptocurrency adoption by reducing uncertainty and boosting user confidence (Campino & Yang, 2024). Both users and non-users regard volatility as a major barrier to adoption, with non-users associating it with limited availability and irreversibility.[6] Users, on the other hand, call for industry regulation to mitigate market risks, particularly those associated with price volatility (Campino & Yang, 2024). These shared concerns underscore the value of regulatory intervention in adoption and use confidence.

Panetta (2023) notes the paradox of an industry originally viewed as a counter to financial centralisation now exhibiting significant centralisation. He argues that the crypto ecosystem suffers from market failures, negative externalities, and inefficiencies. The author warns against growing calls for integrating cryptocurrencies into the traditional financial system, which would effectively legitimise what the author considers their speculative nature.[7]

Empirical evidence on cryptocurrency adoption indicates that competition among private currencies can exist without any single one becoming a monopoly (Mayer & Bofinger, 2024). This challenges the idea of predominant winner-takes-all dynamics, suggesting instead that the cryptocurrency market remains contestable and open to new entrants with multiple cryptocurrencies coexisting stably. According to Peneder (2022), while cryptocur-

rencies have proven the technical feasibility of Hayek's (1990) proposal, they may struggle to sustain a truly competitive environment in the long term. Network effects and the dominance of major digital platforms threaten to stifle competition and entrench existing market leaders.

5.3. The Role of Modern Central Banks and Their Impact on Currency Adoption

Today, central banks operate in a vastly different landscape than during the dawn of fiat currencies. We posit that their evolution presents another challenge to the adoption of cryptocurrencies in a way aligned with Hayek's (1990) vision. While Hayek argued that privately issued currencies would outcompete state-backed fiat money, inter alia, due to the latter's inflationary tendencies, modern central banks have adapted their policies to better manage inflation and promote stability. Still, in countries experiencing economic or political turmoil, people have ditched their national currencies in favour of cryptocurrencies—Bitcoin in particular—in hopes of protecting their wealth (Bas, 2020). Argentina, South Africa, Turkey, and Venezuela are cases in point.

Since the mid-1980s, many developed countries have granted institutional independence to their central banks, allowing them to focus on price stability without direct political interference (Croce & Khan, 2000). This independence has been largely successful, as demonstrated by the low inflation rates maintained by central banks in advanced economies over the past few decades (Bas, 2020). Exceptions, such as the 2008 financial crisis and the aftermath of the COVID-19 pandemic, whose effects were furthered by the Russian invasion of Ukraine, have put central banks under scrutiny and changed the *de facto* scope of their mandates (Bandaogo, 2021; Palley, 2019).

Palley (2019) offers a critical perspective on central bank independence, arguing that it can create a bias favouring capital over labour, reflecting the status quo. He contends that the central bank's actions during crises like the 2008 financial meltdown carry significant distributional and fiscal implications, often overlooked in the literature. This author denounces that discretionary unconventional central bank interventions indicate that central banks, despite their independence, are subject to the biases and interests of the politician appointing the chairman and of the chairman who behaves as a bureaucrat. The author also questions the possibility of a government setting goals and then appointing a chairman who will impartially and neutrally seek them. This critique echoes some of Hayek's concerns about the risks of concentrated monetary authority, albeit from a different political perspective. The expansion of central bank mandates has further complicated this picture. Central banks have taken on responsibilities beyond traditional monetary policy, such as maintaining financial stability and addressing broader societal goals like environmental sustainability and gender diversity (Romelli, 2024).

The emergence of Central Bank Digital Currencies (CBDCs) is yet another challenge that takes us away from Hayek's (1990) proposal. While CBDCs are often touted as a way to modernise payment systems and provide a digital alternative to cash, they are, in essence, an extension of state-controlled fiat money. Rather than representing a move toward currency competition, CBDCs may further entrench the government's role in monetary policy, revitalising Hayek's argument that government monopolies over currency issuance are inherently problematic. As Panetta (2023) notes, CBDCs could crowd out private-sector innovation in digital currencies by providing an apparently risk-free, government-backed alternative.

On the one hand—and perhaps somewhat paradoxically —, CBDCs could be seen as a form of state-level currency competition, as no central bank wishes to see its currency lose relevance in the digital age (Bas, 2020). They can also be viewed as an attempt by central banks to create reliable digital settlement assets that offer an anchor, maintaining

trust across all forms of money in the digital age (Panetta, 2023). As payments become increasingly digitalised, cash—the traditional form of central bank retail money—is losing its ability to act as an efficient monetary anchor. In this context, CBDCs offer a digital, risk-free standard that facilitates convertibility among various forms of private digital money, thereby preserving the singleness of money and monetary sovereignty. On the other hand, CBDCs reinforce the very government monopoly over money issuance that Hayek sought to dismantle. By maintaining the state's control over digital money, CBDCs represent the antithesis of Hayek's call for private competition in the currency market. According to Peneder (2022), this situation once again highlights the evolutionary nature of money as a social institution that co-evolves with technological advances.

In conclusion, the adeptness of modern central banks in managing inflation and their increasing roles in broader economic issues present significant hurdles to the adoption of cryptocurrencies. While Hayek's ideas about currency competition remain theoretically appealing, the entrenched position of central banks and the introduction of CBDCs suggest that government-backed currencies are likely to dominate in the near future, making a transition to a privately issued cryptocurrency-based monetary system unlikely.

6. Final Remarks and Conclusions

This paper has examined the extent to which cryptocurrencies align with Friedrich Hayek's (1990) vision for a competitive monetary issuance system. While initially seen as a challenge to fiat currency, cryptocurrencies have struggled to become a mainstream alternative.

Our analysis reveals several key insights. First, cryptocurrencies broadly reflect Hayek's (1990) ideas, but they have failed in translating these theoretical principles into a practical, stable system. Bitcoin and other unpegged crypto assets, while widely recognised, lack the purchasing power stability and adaptability that Hayek deemed essential to serve as foundations for a new monetary order. As Bas (2020, 2022) observes, their volatile nature has positioned these assets more as something akin to digital gold, rather than as viable, everyday currencies. Much of the literature concentrates on Bitcoin and similar assets, perhaps overshadowing more viable options like stablecoins.

Stablecoins therefore deserve closer scrutiny. Collateralised stablecoins, which maintain value through reserves, offer a closer approximation to Hayek's (1990) vision. In this context, it must be noted that *Denationalisation of Money* suggests a pathway where initial private currency that pegs to fiat currency could gradually transition to commodity-backing—starting with gold; this is a concept that deserves further exploration. On the other hand, non-collateralised stablecoins rely solely on algorithms to adjust supply and struggle to maintain consistent value, thus falling short of Hayek's criteria for stable private money.

Still, the challenges faced by cryptocurrencies today differ markedly from the circumstances Hayek (1990) confronted. For instance, the high complexity of cryptocurrencies may discourage adoption, particularly in developed economies with ageing populations that—for various reasons—are slower to integrate technological innovations. Moreover, the original motivations behind Hayek's proposal have shifted substantially. In developed economies, inflation control is now primarily managed through central banks with institutional independence, an arrangement which has been largely successful and tempered demand for alternative monetary systems. Nevertheless, the contemporary expansion of central banks' roles to address various objectives could shift this balance. As central banks gain more discretionary power, recent examples, such as the aftermath of the Russian invasion of Ukraine, illustrate the potential for political pressure on monetary policy, echoing Hayek's concerns over government influence over the latter.

The independence of central banks also raises questions. While independence supports monetary stability, it entails trade-offs, including potential socioeconomic consequences

that impact mostly labour, as noted by Palley (2019). Yet, mainstream research often overlooks these distributional effects. This implicit bias may explain why there is little academic urgency to establish a comprehensive legal framework for the crypto sector. Instead, the absence of regulation seems to align with a cautious delay, effectively buying time for CBDCs to advance as the preferred model for future digital finance. This delay may reflect an underlying tension between the preservation of state control over monetary policy and the emergent demand for decentralised financial systems, revitalising some of the claims within *Denationalisation of Money*.

Ultimately, whether Hayek's vision can materialise remains uncertain. Given the prevailing structures and the inertia of established monetary systems, a transition to a competitive, cryptocurrency-based monetary order seems improbable in the near term. Future research might explore the theoretical question of whether dismantling government monetary monopolies, namely via cryptocurrency adoption, could itself become a distortion of historic financial norms, highlighting the inherent challenges in disrupting long-standing systems.

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Notes

1 Bas (2020, 2022), on the other hand, claims that this corresponds to merely a transitional phase. For this author, collateralised stablecoins may be considered Hayekian money when viewed from the perspective of supplier behaviour.

2 These elements were generated in RStudio using commands to retrieve data from *Yahoo Finance* for the Euro and Japanese Yen, as representatives of state fiat currencies, gold and the S&P500 index, as conventional financial assets, Tether, as the representative of stablecoins, and Bitcoin. The selection of these assets as references for the latter two was inspired by the works of Aharon and Demir (2022), Yousaf and Yarovaya (2022), and Yousaf et al. (2022). Data were retrieved, when available, from 3 January 2009, since this was the date that the first 50 Bitcoins were mined (Wallace, 2011), until 30 June 2024, marking the end of the last complete semester. The measure of volatility used is daily percentage returns, capturing the day-to-day fluctuations in an asset's closing price relative to the previous day's value.

3 In fact, Bitcoin's rigid supply rule has been found to be the cause of its volatile and explosive price behaviour by Podhorsky (2024).

4 The author relies on the work of Friedman (1984), who suggests that individuals would only seek alternative currencies when they suffered from severe inflation, as happened in Mexico in the 1980s. Although Mexican people benefited from the freedom to use foreign currencies, partial dollarisation only occurred in the face of heavy inflation. We could also mention that the mass adoption of a non-national currency only occurs in abnormal circumstances, such as those occurring in Zimbabwe since the mid-2000s and Venezuela since late 2018, as reported by Castañeda et al. (2024). Still, in Peru, the national currency is only used for smaller local transactions and paying taxes, as residents are free to use either Nuevo Peruvian Soles or United States dollars.

5 Panetta (2023) argues that blockchain transactions are inefficient, slow, and costly, referring to the 'blockchain trilemma,' where optimal security, scalability, and decentralisation cannot all be achieved simultaneously.

6 It should be noted, as Alonso et al. (2024) argue, that traditional measures designed to prevent speculative bubbles are unlikely to be effective in the case of Bitcoin, due to its digital and decentralised nature. Consequently, as these authors argue, modern regulatory approaches will likely need to adopt innovative and forward-thinking strategies. We speculate, however, that such measures may also expand regulatory bodies' discretionary powers and concomitant risks.

[7] Panetta (2023) also draws attention to the potential of unbacked crypto assets for circumventing capital controls, sanctions, and financial regulation. The author opposes the notion of stablecoin issuers, as non-bank financial institutions, holding central bank reserves, warning that such a move could erode monetary sovereignty, financial stability, and payment system integrity, thereby socialising crypto-related risks.

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