

Rethinking the money: Properties of money in the digital age

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Over the past two decades, technological progress has changed not only how people pay, but also how they think about money itself. Cards, mobile wallets, instant payments, crypto-assets, stablecoins and the prospect of a digital euro have widened the menu of instruments that can be used to transfer value. Yet broader choice has also created confusion. The fact that something is digital, fast or programmable does not automatically make it money in the full economic sense. This paper revisits the traditional properties of money and asks how they should be interpreted in a world shaped by platforms, real-time payments, and tokenised claims. It argues that the classical functions of money remain valid, but that in the twenty-first century they must be complemented by institutional properties such as convertibility at par, settlement finality, resilience under stress, privacy protection, and interoperability. Against this benchmark, the paper compares commercial bank deposits, crypto-assets, stablecoins, tokenised deposits and central bank digital currencies, with particular attention to the digital euro. The central conclusion is that digital innovation is changing the form of money far more than its essence. Good money in the twenty-first century is still money that is trusted, stable, widely accepted and embedded in a credible public framework. From that perspective, the digital euro is best understood not as a technological fashion, but as a strategic attempt to preserve public money in a digital economy.

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1. Introduction

The history of money is also a history of changing expectations. At different moments, societies have wanted money to be durable, portable, universally accepted, easy to verify and stable enough to support contracts over time. In each period, the dominant form of money shaped which of those properties seemed most important. When money took the form of metal, physical durability mattered greatly. When banknotes spread, trust in the issuer became more important. When bank deposits became the main means of payment, account infrastructure, bank regulation, and settlement arrangements moved to the centre of the story. The last two decades have brought another step in this long evolution. In everyday life, money has become less visible and more embedded in digital interfaces. Consumers tap a phone or watch rather than hand over cash. Firms settle invoices through automated platforms. Cross-border commerce increasingly takes place in digital environments where users hardly see the underlying payment architecture. At the same time, private innovators have proposed new forms of digital value transfer that explicitly challenge

older distinctions between money, payments, and financial assets. Crypto-assets promised “money without the state”. Stablecoins promised internet-native digital cash. Central banks responded by re-examining whether public money also needs a digital form.

These developments have revived an old question in a very modern setting: what makes money, money? Classical monetary theory still offers a useful starting point. Money is expected to serve as a medium of exchange, a store of value and a unit of account; it also supports deferred payment and financial contracting. But a purely functional definition is no longer fully sufficient. In digital systems, an instrument may perform one or two monetary functions while still failing as money in a broader public sense. A token may be easy to transfer but too volatile to store value. A private digital claim may be accepted on one platform yet unusable outside it. A payment instrument may be fast and programmable while still depending on conversion into a more trusted form of money.

The framework proposed by Hull and Sattath (2021) shows that digitalisation has expanded the set of relevant monetary properties. In a world of digital networks, attention must also be paid to privacy, security, scalability, pro-

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grammability, latency, and governance. The contribution of this article is not to repeat their entire taxonomy, but to use it as a bridge between classical monetary thinking and current policy debates. The aim is to show that good money in the twenty-first century cannot be judged by technology alone. It must be assessed against both traditional functions and modern institutional expectations.

Digital innovation has unquestionably improved the way money moves, it has not, however, automatically improved the properties of the money. This distinction matters, as we need to keep in mind that money remains a social institution before it is a technical object. Money works because users trust that it will be accepted tomorrow, that its value will not collapse overnight, and that it fits into a legal and institutional environment capable of supporting large-scale exchange.

2. From cash to code: how the properties of money have changed

Money did not begin as a line of code, and it did not even begin as a state monopoly. Early forms of money emerged because barter is costly. Search models in monetary economics formalised this intuition by showing how a generally accepted medium of exchange can arise when direct exchange is too cumbersome (Kiyotaki & Wright, 1989; Lagos & Wright, 2005). In such settings, money is valued not primarily because of what it is made of, but because other people are willing to accept it. That insight remains relevant today.

Still, the material form of money has always influenced public expectations. Commodity money placed a premium on intrinsic scarcity. Coins emphasised uniformity and recognisability. Banknotes shifted attention toward the issuing authority and, historically, toward convertibility into specie. In the twentieth century, however, there was a sharp move into dematerialisation of money, which saw the monetary centre of gravity moved decisively toward bank deposits. Most money used in advanced economies is now private bank money, created and circulated within a framework of regulation, prudential oversight, and settlement in central bank reserves (McLeay et al., 2014).

As money becomes less tangible, institutional trust becomes more important. A bank deposit is not valuable because of its physical form. It is valuable because people expect that it will be redeemable at par, that it can be used to settle obligations, and that public institutions will support the integrity of the system in which it circulates. Brunnermeier and Niepelt (2019) describe this relationship elegantly by showing that private and public money can appear equivalent under certain conditions. But those conditions

include the existence of a credible public anchor. Put differently, private money works best when it remains closely tied to public money.

The digital era has deepened rather than overturned this logic. On the surface, digital payments look like a story about interfaces: contactless cards, mobile apps, QR codes, e-commerce checkouts, instant peer-to-peer transfers. Underneath, however, these innovations mainly change the rails over which existing money moves. A mobile phone payment may feel radically different from cash, but in most cases it still transfers a bank deposit, which can be in turn exchanged for central bank money. The technology is new; the underlying money is not.

This distinction prevents an exaggerated reading of recent change. Faster payments are not automatically a new type of money. Better wallets are not new units of account. At the same time, digitalisation does alter what the public expects from money. Users increasingly assume that money should be available at any hour, transferable almost instantly, integrated into digital commerce, and compatible with cross-border online activity. Hull and Sattath (2021) capture this shift by showing that modern monetary properties include not only the classical triad of exchange, storage and accounting, but also design features that matter specifically in digital systems.

The first traditional function, medium of exchange, has become inseparable from interoperability and convenience. Money must still be accepted by others,

but today acceptability is shaped by digital ecosystems, networks, and standards. The second function, store of value, has acquired a more explicitly institutional dimension. In the modern world, preserving value is less about metallic backing and more about macroeconomic credibility, legal certainty and financial stability. The third function, unit of account, remains the most stubbornly traditional.

Prices, wages, taxes, and contracts continue to be denominated overwhelmingly in sovereign currency.

A further property, often implicit in older literature, is resilience under stress. Money should work not only in normal times but also and especially when confidence is tested. This is where many digital claims encounter difficulty. During stable periods, users may treat a private digital instrument as money if it is convenient and cheap. But if redemption becomes uncertain, if its market price falls sharply, or if platform access is disrupted, the illusion of full monetary equivalence disappears quickly. Historical experience with bank runs and shadow banking reminds us that apparently safe and liquid private claims can become fragile when confidence turns (Diamond & Dybvig, 1983; Schmidt et al., 2016).

Digitalisation adds one more layer: the politics of data. In a twenty-first century monetary system, users increasingly care not only about whether money is accepted and stable, but also about what happens to the data generated by its use. Privacy is therefore no longer a side issue. For cash, privacy was built into the instrument. For digital payments, it must be designed into the system. The same applies to cybersecurity. A form of money that is theoretically elegant but operationally vulnerable will not satisfy public expectations for long.

The upshot is that the properties of money have not been replaced, but they have been reweighted. Classical monetary theory still gives us the right core. Yet in a digital economy, good money must also be interoperable, secure, scalable, and governed in a way that preserves trust.

3. New monetary forms and the return of the hierarchy of money

Once the properties of money are stated in this broader way, the current landscape becomes easier to interpret. What looks like a confusing proliferation of “digital monies” can instead be understood as a set of instruments occupying different positions in a monetary hierarchy. Some are already money in a well-established sense. Some are close substitutes. Some are payment technologies rather than new money. And some are speculative assets wearing monetary language.

A clear starting point for a discussion on monetary forms is physical cash: public money issued by the central bank. In some jurisdictions, including Slovenia, cash still represents more than half of all point-of-sale payments. Cash also always works, independently of any communication infrastructure. However, the very physical nature of cash necessitates physical contract for it to work, limiting its portability and making it only conditionally suitable for the increasing share of e-commerce.

Commercial bank deposits remain the benchmark private form of money in most advanced economies. We use the term commercial bank deposits for a wide array of payment rails, from card payments, mobile payments, and regular and instant transfers. They are all digital, widely accepted and deeply integrated into commerce. Their success is not accidental. Deposits combine everyday usability with institutional support. They are anchored in a legal framework, integrated with settlement systems and supported by prudential regulation, supervision and central bank liquidity backstops. In normal conditions they perform the functions of money extremely well. Their weakness is not in daily use but in stress scenarios, where the distinction between private bank money and public central bank money can re-emerge. Instant payment systems are not new money, but they may do more to modernise everyday monetary use than many more glamorous innovations. By making existing bank money faster, more available and more convenient, they address a large part of what users actually want. Sometimes the most effective monetary innovation is not to invent a new instrument, but to improve the rails of the existing one.

Tokenised deposits should be understood largely as an extension of this same logic. They are not a new monetary universe but a different technological representation of conventional bank liabilities. We still treat them as a new and emerging monetary form because they add a layer of programmability, automation and the possibility of integrating payments more closely with digital platforms, smart contracts and tokenised financial markets. Their strength is precisely that they do not try to reinvent money from scratch. If redeemability at par and prudential safeguards are preserved, they can offer technological innovation without destabilizing the monetary hierarchy. At the moment they still suffer from poor interoperability with other system and the legal framework for its use is not yet in place.

Table 1. A practical comparison of the main monetary forms

Instrument	Main strength	Main weakness	Best description
Physical Cash	Oldest and most trusted form of money	Low transferability, not adapted for the digital age	Archetypical public money
Commercial bank deposits	Widely accepted, convenient, deeply integrated into daily payments	Depend on banking regulation and public backstops	Private money anchored in public money
Tokenised deposits	Programmability and easier use in digital platforms	Need interoperability and clear legal treatment	Technological upgrade of bank money
Stablecoins	Potentially useful in niche digital ecosystems	Redemption, reserve, and governance risk	Private money-like claim with conditional stability
Crypto-assets	Transferability in decentralised networks	High volatility and weak monetary use	Speculative digital asset rather than money
Digital euro	Public backing, broad acceptance, strong trust base	Design trade-offs around privacy, scale and intermediation	Digital form of public money

Stablecoins are more ambiguous. Their promise is easy to understand. They attempt to combine the convenience of internet-native digital transfer with a more stable value than conventional crypto-assets. Some aim to maintain that stability by holding reserves in sovereign money and safe assets. At first glance, stablecoins look like a natural response to digital commerce. Yet their very design reveals an important truth: they do not create a new unit of account. They borrow credibility from an existing one. A euro-denominated or dollar-denominated stablecoin is stable only to the extent that users trust the reserve structure, governance, redemption mechanism, and legal enforceability behind it.

That trust problem is not trivial. Experience from shadow banking and money market funds suggests that private claims marketed as cash-like can become unstable under pressure. Newer work on stablecoins reaches a similar conclusion. Public information about reserves, the quality of collateral and the governance of issuers can matter sharply for run risk (Ahmed et al., 2024). This does not mean stablecoins are irrelevant. They may play useful roles in specific ecosystems, especially where users value always-on functionality or smoother movement between tokenised environments and conventional finance. But they are not neutral innovations. They can create new forms of fragility and new dependencies on large private infrastructures.

Crypto-assets such as Bitcoin present a different case. Their advocates often describe them as money of the future, but in economic terms they remain unconvincing. Bitcoin's design solves a particular technical problem: how to transfer a scarce digital object in a decentralised system without relying on a central operator. That is an important innovation in distributed systems. It does not, by itself, solve the economic problem of money. As empirical work has shown, Bitcoin behaves much more like a speculative asset than a stable medium of exchange or store of value (Baur et al., 2018; Liu & Tsyvinski, 2021). Its purchasing power is highly volatile. Everyday pricing in Bitcoin is extremely limited. Most users still think of it in terms of gains and losses measured in a sovereign currency.

The practical weakness of crypto-assets can be summarised simply. As a medium of exchange, they are a niche. As a store of value, they are unstable. As a unit of account, they are almost absent. Even when economic models allow privately issued currencies to coexist with sovereign money, it is a long way from proving that actual cryptocurrencies perform the social and institutional role of money in real economies (Schilling & Uhlig, 2019; Benigno, 2023).

4. Why the digital euro matters

The case for the digital euro does not rest on a claim that existing money has failed. It rests on the recognition that the environment in which money is used is changing. For central banks, this is a subtle but important difference. The question is not whether public money should replace private money in retail payments. The euro area already relies successfully on a two-tier monetary system in which public money anchors a large universe of private bank money. The question is whether, in a world where payments are increasingly digital, platform-based and sometimes dependent on non-European providers, public money should remain directly available in a digital form. The European Central Bank's public communication on the digital euro makes this objective clear. The project is presented as an electronic means of payment that would be available free of charge for basic use, accepted across the euro area, and usable online or offline, through a phone or a card (ECB, 2026). The ECB also emphasises privacy, noting that the Eurosystem would not be able to identify users or their purchases from the payment data it receives, and it frames the digital euro as a complement to cash rather than a replacement (ECB, 2026). The European Commission's legislative package places the same idea into a broader public-policy context: the digital euro would provide an additional means of paying with public money in a digital form while preserving the role of cash and supporting resilience, acceptance, and strategic autonomy in payments (European Commission, 2023).

Why does that matter? The first answer is monetary sovereignty. In daily life, users often care little about the identity of the infrastructure provider. But from a public-policy perspective, it matters if a monetary area becomes highly dependent on a small number of private, sometimes foreign, payment schemes and platforms. Payment dependence can create vulnerabilities related to resilience, market power, pricing, and strategic autonomy. A digital euro would not eliminate private providers, but it could strengthen the public core of the system.

The second answer is trust. A central bank digital currency would represent a direct claim on the central bank. In that sense, it would preserve in digital form what cash provides physically: access to public money for the general public. This matters symbolically and operationally. Symbolically, it reinforces the idea that money remains a public good even in a highly digital economy. Operationally, it creates an option for digital payments that does not depend on the balance-sheet strength or business model of a private intermediary.

The third answer is contestability and innovation. A public digital option can support private innovation rather than suppress it. If the digital euro is designed as a common standard that private intermediaries use to build services, it may create a level playing field and reduce dependence on a few dominant private networks. Much depends on design. A poorly designed retail CBDC could crowd out bank intermediation or create operational burdens. A well-designed one could support competition at the interface layer while preserving financial stability.

This is where the trade-offs become real. The digital euro is attractive partly because it could combine several properties that users increasingly want: digital convenience, broad acceptance, public backing, resilience, and privacy protections. Yet those same goals can conflict with one another. Strong privacy protections may be difficult to reconcile with anti-money laundering and compliance obligations. Broad accessibility and safety may increase attractiveness in stress situations and therefore raise questions about deposit shifts from banks to central bank money. Programmability can enable useful new services but may also create concern that money could become conditional. Monetary sovereignty can be strengthened by a public digital option, but only if adoption is meaningful and the user experience is genuinely competitive.

The academic literature on central bank digital currency makes these trade-offs clear. Williamson (2022) shows that a CBDC can improve welfare under certain conditions, especially where it offers a safe asset that competes with other payment instruments. At the same time, the impact on bank funding and monetary transmission depends heavily on design. More recent work has stressed that large-scale CBDC adoption could affect the structure of deposits, reserves, and the operational framework of monetary policy, even if the overall macro-financial consequences are manageable under prudent design assumptions (Abad et al., 2025; Schilling et al., 2024). This is why central banks rarely discuss CBDC in simple pro-innovation terms. For them, the issue is not novelty; it is system design.

Against other digital options, the digital euro has one central advantage: it does not need to import trust from elsewhere. Stablecoins depend on reserves and issuer governance. Crypto-assets depend on market narratives and speculative demand. Tokenised deposits depend on the existing banking framework. A digital euro would be public money by construction. That does not mean it would automatically be better for every use case. But it does mean that when users ask the most basic monetary question – will this still be worth one euro tomorrow, and will everyone treat it as one euro? – the answer is unusually

straightforward: if this is true for a euro coin or a banknote, it must be true for their digital twin as well.

There is also a practical point that is sometimes overlooked. For many users, what matters is not ideological preference but confidence that payments will continue to work in a fragmented, increasingly digital world. In that sense, the digital euro is less a futuristic gadget than a continuity project. It aims to keep the basic qualities of public money available under new technological conditions.

5. Rethinking good money in the digital age

What, then, counts as good money today? The answer is not radically different from what earlier generations would have recognised, but it is broader. Good money must still be stable, widely accepted and usable as the main unit in which the economy thinks and contracts. Yet in the twenty-first century, users also expect money to be seamlessly available in digital environments, secure against technical disruption, compatible with modern payment habits and respectful of legitimate privacy concerns. Good money is therefore both a monetary instrument and a service environment.

This updated view has several implications. First, it suggests that the line between money and payments should be kept conceptually clear, even when the two are operationally intertwined. Much public confusion arises because people encounter money mainly through payment interfaces. If the interface is smooth, the underlying instrument is assumed to be good money. But this is only partly true. A beautifully designed app can sit on top of a weak claim. A clumsy interface can sit on top of a very strong one. Policymakers need to care about both layers.

Second, the updated view puts public trust back at the centre of monetary analysis. Digital enthusiasts often emphasise decentralisation, programmability or speed. These features are important, but none substitutes for the expectation that a monetary instrument will remain stable, accepted and redeemable when conditions deteriorate. In fact, the more digital and frictionless payments become, the more damaging any sudden loss of trust can be. A run on a digital instrument can move much faster than a run in a physical world. This is why governance and institutional design matter more, not less, in digital money.

Third, the updated view suggests that policy should not be technologically neutral in a naïve sense. Different instruments perform different social functions and create different risks. A regulated bank deposit, a euro-backed stablecoin and a speculative crypto-asset should not be treated as if they were interchangeable merely because all are digitally transferable. The proper regulatory question is

functional: what monetary role does the instrument actually play, and what public obligations should follow from that role? The closer a private instrument comes to acting like money, the stronger the case for robust requirements on reserves, liquidity, transparency, redemption and operational resilience.

Fourth, the updated view highlights a productive middle ground between public monopoly and private fragmentation. The best future monetary order is unlikely to be one in which the state does everything directly, nor one in which public money retreats completely behind private platforms. A more plausible model is one in which public money remains the anchor, while private actors innovate around it in ways that preserve par convertibility, interoperability, and financial stability. The digital euro fits naturally into this vision. So do instant payment systems and, under the right legal framework, tokenised deposits.

Fifth, good money in the twenty-first century must be compatible with democratic expectations about privacy and control. This is a delicate area. Cash provided privacy by default. Digital systems cannot reproduce that fully without raising concerns about illicit activity and compliance. At the same time, a fully traceable payments environment can erode public trust. The challenge is therefore institutional rather than purely technical: to design systems where the collection and use of payments data are limited, justified and governed in a way that people can trust.

Finally, the updated view should make us more cautious about claims that monetary innovation is necessarily disruptive. Many improvements that users want – faster settlement, easier integration into e-commerce, better user interfaces, cross-border usability – can be delivered by upgrading the existing system rather than by replacing it. This is one reason why instant payments deserve a more central place in discussions about the future of money. They show that substantial innovation is possible without weakening the link between private money and the public monetary anchor.

The practical policy conclusion is therefore balanced but firm. Central banks should continue to modernise payment infrastructures, support competition and interoperability, and prepare public money for a more digital environment. Regulators should distinguish more clearly between digital assets, payment instruments and monetary substitutes, and should subject money-like private claims to money-like standards. Banks should view the digital euro not only as a potential competitor, but also as a catalyst for improving European payments and for building new services on a more resilient base. And the wider public should be encouraged to ask a slightly better question than whether a new

digital instrument is “the future”. The better question is whether it improves on the qualities that have always made money useful.

Money is not good because it is new. It is good because people can rely on it. In the digital age, reliability means even more than it once did. It means convenience, cybersecurity, legal clarity, data protection and broad digital usability. But what makes any money good money still begins with the old foundations: stability, acceptance and trust.

6. Conclusion

Digitalisation has changed the appearance of money quicker than it has changed its essence. We argued that the traditional functions of money remain the right starting point for understanding new monetary forms, but that they need to be complemented by a broader set of digital-era expectations. In the digital age, good money must be not only a medium of exchange, store of value and unit of account, but also secure, interoperable, resilient, privacy-conscious and embedded in a credible institutional framework. Seen through that lens, the current monetary landscape looks less revolutionary than many public narratives suggest. Commercial bank deposits remain the main operational money of modern economies. Instant payments improve how that money moves. Tokenised deposits may improve how it can be used in digital environments. Stablecoins may have a role in specialised ecosystems, but their monetary quality is conditional, and their stability depends on governance and redemption structures. Crypto-assets, despite their technological interest, do not perform the core social role of money well enough to qualify as good money for the wider economy.

The digital euro stands out because it addresses a different question. It is not mainly an attempt to imitate private innovation or to create a fashionable new payment product. It is an attempt to preserve the role of public money as economies become more digital, more platform-based and more exposed to fragmented payment infrastructures. That makes the digital euro less radical than its critics fear and more important than its supporters sometimes explain. Its value lies in continuity under changed technological conditions.

Rethinking money today therefore does not require abandoning old theory. It requires us to update that theory with new assumptions. The most important lesson is that money remains a public institution even when it is delivered through private interfaces and digital networks. A society may innovate endlessly in the ways it moves money, but it cannot do without a trusted monetary anchor. In the twenty-first century, the challenge is to make sure that anchor remains fit for a digital world.

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