

The changing role of money

In our 'New Money' series, we explore the changing role of money and financial services in society. Cryptocurrencies and crypto-assets, full-reserve banking and central bank digital currencies are the three key areas around which the monetary debate is centred. We take a look at these in detail

In this bundle



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One clear example of “New Money” is cryptocurrency, which fits into the broader category of crypto-assets. The market suffered huge losses...



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New Money IV: Will central banks go digital?

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Why talk about money?

The money we deal with on a daily basis may very well undergo radical change in the not-too-distant future. We aim to discuss these changes in our “New Money” series. Why? Because rich or poor, money is one of the greatest sources of stress for people around the world. It touches every aspect of our lives from what we eat to where we live to how we think.

Studies show that money often determines our [level of happiness](#) and even our [life expectancy](#).

The ongoing digital revolution, led by big tech companies, is affecting payments, money and the wider financial system, and it could have major repercussions for the way we all go about our financial business. We will return to this in later articles.

But let's zoom in first on money itself. It is surprising that there is, in fact, no consensus among economists as to the exact nature of money. Just what *is* it precisely? A voucher issued by an online retailer? Bitcoin? A tin of mackerel!? Most people, economists included, consider a bank deposit to be money. Yet in a strict legal sense, it's not.

To be sure, the *function* of money is not in dispute: most economists agree that it acts as a medium of exchange, a unit of account and a store of value.

But its inherent characteristics are far more unclear. There are deeper questions to answer. And these are becoming increasingly important as new strides in technology enable new forms of money to move from the realm of fiction to reality.

"New money will have consequences for the way we all go about our daily financial business"

The core money topics of today

Today's monetary debates are taking place in three areas. We briefly introduce them here, and cover them in depth in separate companion articles.

- **Cryptocurrencies and crypto-assets:** Driven by the innovative combination of existing digital technologies, bitcoin has been hailed by some as an alternative to the traditional payments system. As the system is decentralised, there is no need for intermediaries like banks, and the presence of a central bank is considered blasphemy. As such, monetary policy and credit need a fundamental rethink. Still, reality has proven more difficult than theory. Crypto markets are discovering that decentralised *software* does not necessarily result in decentralised *markets*. That doesn't mean the cryptocurrency ideal is dead. Indeed, cryptocurrencies have spawned a separate strand of [blockchain](#) research at the intermediaries it set out to make obsolete. Those intermediaries are now bringing to market the first blockchain-driven financial services, and more may be underway. If nothing else, blockchain and derivative technologies may provide an excellent opportunity to digitise and "tokenise" services that until recently still ran on infrastructure from the last century.
- **"Full reserve banking":** There are various plans, going back to the [Chicago Plan](#) of the 1930s. In these plans, deposit-taking banks have to park all the funds received at the central bank, and are not allowed to lend. Institutions that lend, in turn, are no longer allowed to issue deposits (they are stripped of their [money creation](#) licence). Unlike cryptocurrencies, the system remains centralised, with only the central bank allowed to create money. This prompts a rethink of credit provision, and of the government's role in the economy. Important details differ, leading to different proposals such as Sovereign Money (championed for example by Positive Money in the UK and Vollgeld in Switzerland), Full Reserve Banking and Narrow Banking.
- **Central bank digital currency (CBDC):** The CBDC debate is somewhat different. CBDC is not necessarily an alternative to the current system (although it is sometimes presented as such). Instead, it can be added to it. Recent technological advances (such as cryptocurrencies) have also revived this debate, despite the fact that CBDC was perfectly possible with existing digital technology. CBDC has, in fact, been around for decades, in a form restricted to selected counterparties (mostly licenced banks).

"The cryptocurrency ideal is not dead yet"

But New Money is not just for wonks to ponder

These are the core topics for money wonks. But money concerns all of us. Let's first dive into the fundamentals: why does money have value to us? And what forms can money take? There are many angles to this debate which show why it is so interesting and perplexing. We hope to clear up some of the confusion. Do drop the authors a line to share your thoughts and ideas.

New Money II: The fundamentals

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Money has value as long as we all agree on it

Why does money have value? Unlike the gold coins of the past, most forms of money we use today lack inherent value: they are just a piece of paper, some scraps of metal, or a few pixels on a screen representing some number. So it is clear that modern money does not derive its value from its physical, or otherwise objective, properties. In fact, the concept of “value” is a very human one. Would gold have value in a world without people? The value of money is based on its collective acceptance as a means of exchange. In other words, money is a “*social construct*”.

This means there is no *fundamental* difference between bitcoin and the euro. Both are accepted by their respective communities. Of course, there is an immense *practical* difference. The euro’s community is a lot bigger. Also, it certainly helps that eurozone governments are part of it, requiring their citizens to pay taxes in euro, while disallowing bitcoin tax payments. Yet governments, and the law designating the euro as the eurozone’s legal tender are themselves social constructs, implicit collective agreements between citizens that are evolving over time. In the end, most of the human world functions the way it does because we all collectively agree that it should function like this.

If money is a *social* construct, its physical or digital appearance really does not matter, as long as basic requirements about scarcity and reliability are met. Which is why cans of mackerel, pieces of paper, bits and bytes moved around by banks, as well as tokens logged on a blockchain can, in

principle, all function as money.

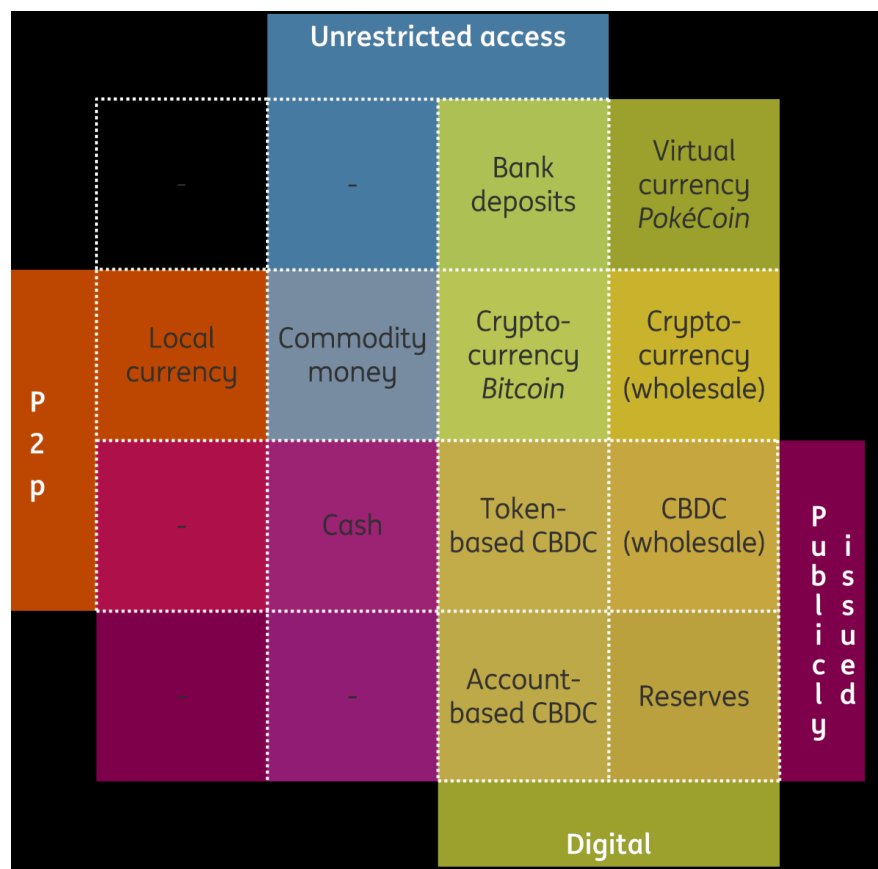
The many different incarnations of money

There are many ways to bring some order in the world of money. A useful one for our purpose is the “money flower” (BIS 2017). This uses four characteristics to distinguish different sorts of money:

1. **Governance and administration:** Money issuance can be public (typically involving the central bank) or private (e.g. issuance by a commercial bank or on a decentralised blockchain);
2. **Accessibility:** Access to money can be restricted (e.g. for wholesale parties only) or unrestricted;
3. **Form:** Money can be physical or digital; and
4. **Transfer mechanism:** money can be account-based (meaning the payer's balance is checked before a transaction is done) or peer-to-peer (meaning the money token itself is verified, as in physical cash and cryptocurrency transactions).

Combining these four characteristics yields a matrix with 16 cells. At least 11 of them can be populated with existing forms of money (though not always money from a legal perspective). So who thought the world of money was dull and boring?

The many incarnations of money



Disentangling current debates about money

Although we take the function of money for granted in our daily lives, there has always been debate about the setup of the monetary system. The recent intensification of this debate can be traced back to three developments:

1. The Global Financial Crisis and its aftermath shook trust in the financial sector, and sparked fresh thinking about financial regulation, stability and the monetary system;
2. The arrival of bitcoin and its blockchain technology in 2008 opened up technical possibilities to pursue libertarian ideals of financial transactions without the need for private nor public intermediaries;
3. Other technological advances enabled fintech companies and platform businesses to enter and “disrupt” the financial sector, in particular the retail payment system.

All of these developments have cast doubt on the existing system and sparked debate on many levels. To facilitate the discussion, it is helpful to zoom into the relevant questions, moving from the abstract and all-encompassing to the concrete and specific:

1. **Social-philosophical angle.**
 - To what extent are citizens allowed to be able to safely transact in and hold “public”, “risk-free” money (that is not a liability of a private institution)?
 - What are the redistributive consequences of different monetary systems? Who gets to decide on policies that produce these consequences? Examples are redistributive consequences of inflation, interest rate policies and of moving towards a cashless society.
 - What is the trade-off between convenience (the ease of using money) versus privacy, data ownership and anonymity?
 - What financial and non-financial risks are households exposed to, and what degree of protection should they receive?
2. **Financial stability angle:** Discussion of the trade-offs between financial stability on the one hand and some of the other goals mentioned in the bullets here, such as privacy or disintermediation.
3. **Economic angle:** Discussion of money supply and demand properties determining inflation, and of the trade-offs between, say, economic growth and the availability of credit to fund it, as well as other goals.
4. **Tech angle:** What setup is feasible? What are the possibilities, limitations and trade-offs from a technical perspective? How about cybersecurity?
5. **Business model angle:** What would be the effect of different monetary reforms on the business models of financial services providers, and of their clients?

Any alternative to the current monetary system will come with trade-offs compared to the current system. These trade-offs will present themselves at all levels, both in the alternative system and during the (hypothetical) transition towards it. What trade-offs will society be prepared to accept?

In the coming articles, we will discuss some alternative systems and the trade-offs they bring with them. Given that money and finance are the plumbing of the economy, any changes to the system, whether incremental or fundamental, should be considered carefully.

New Money III: Why the crypto debate is far from over

One clear example of “New Money” is cryptocurrency, which fits into the broader category of crypto-assets. The market suffered huge losses...



Source: Shutterstock

The debate around crypto is far from over

There is no doubt that 2018 was a reality check for crypto enthusiasts. Q4 2018 saw a strong contraction in the cryptocurrency market, which led to a 45% loss of almost \$100 billion in market capitalisation. This is hardly surprising: the value of peer-to-peer cryptocurrencies has no clear economic or legal basis. As we argued [elsewhere](#), they do not satisfy the three basic functions of money: store of value, means of exchange and unit of account. Therefore, the steep increase in the exchange rate in the early stage of their adoption was simply unsustainable. However, although the hype around Bitcoin is rapidly fading away, the debate around crypto remains quite active and far from over, so here are few reasons why you do need to keep watching this space.

The rules of the game: “in algorithm we trust”?

Crypto supporters often argue that with blockchain technology and cryptocurrencies it is possible

to build a financial eco-system with decentralised governance. Yet there are several issues with this idea. Firstly, before you can trust an algorithm you need to trust its coder. Ultimately, the “money” business is a “trust” business. Some people say: trust the code, instead of the intermediary. But most people cannot interpret the code. So people need to hire someone to vet the code for them. But wait, that's just an intermediary. Only this time, it's an auditor.

Secondly, we think that a centralised governance is more likely to succeed given the strong economies of scale behind the proliferation of digital assets. The economic forces driving digital assets are no different than a platform-dominance game: the value increases (for all customers) as more clients join. For example, having one phone in a network is useless, but having 10 phones is much more useful. By extension, the value of the network increases as more people join the phone network.

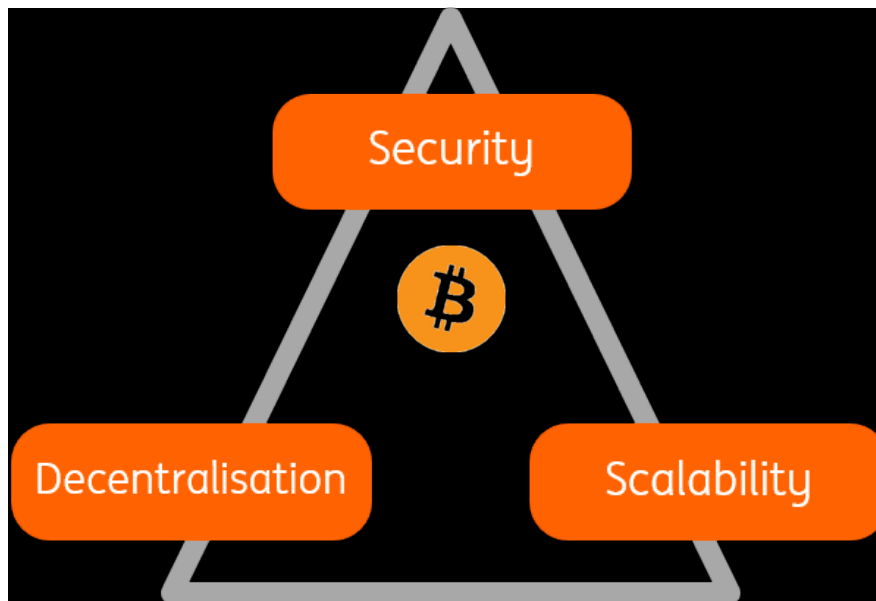
An area where algorithms could potentially assist is in the conduct of a monetary policy rule (e.g. Taylor rule). However, it is hard to imagine monetary policy on "autopilot" without some form of public accountability. What would happen when things go wrong and who would bear the ultimate responsibility? But more importantly, monetary policy is often discretionary rather than rules-driven. There is a difference between decentralised software, and a market without public intervention. Maybe technology could help to address the first issue, but market failures do exist irrespective of technology. Therefore, don't expect public intervention to disappear following a technological innovation – not even a breakthrough one.

Can cryptocurrencies escape the “impossible trilemma” curse?

So, what is stopping governments from adopting cryptocurrencies? There are two main issues, one relates to technology, the other one to international finance and politics.

The first issue is the *Scalability Trilemma*, which describes the impossibility, at least with current technology, to have scalable, secure and fully decentralised cryptocurrencies all at the same time (Fig.1). In other words, you can pick and choose two out of three options, never all of them together. Bitcoin, for example, prioritised security and decentralisation over scalability. Conversely, if you want a decentralised and scalable cryptocurrency, you have to make concessions on security. You can't have them all.

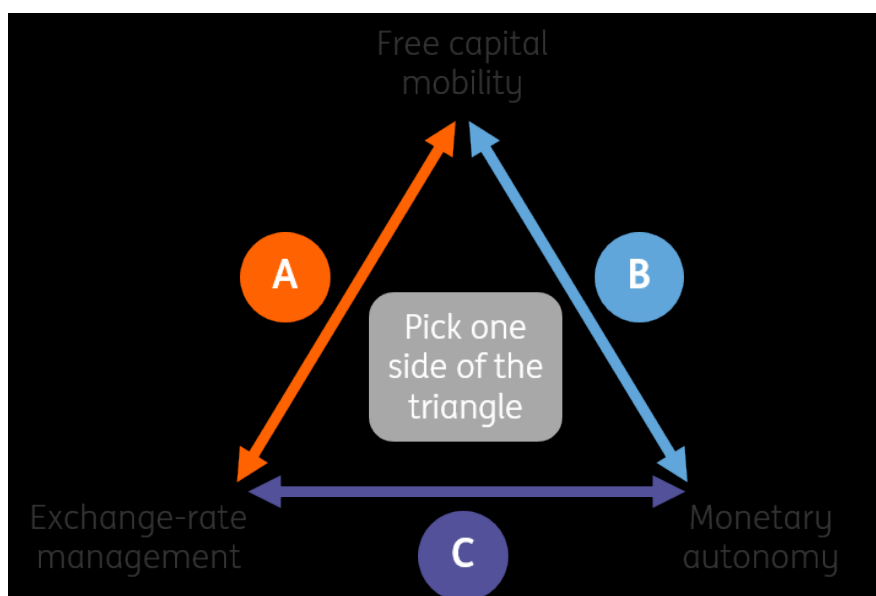
Fig. 1 - The Scalability Trilemma



Source: Vitalik Buterin, J.Dwyer

The second issue relates to another popular [Impossible Trinity](#), which states that a country cannot achieve free capital mobility, monetary policy autonomy and a stable exchange rate all at the same time (Fig. 2). As an example, if a small open economy decides to peg its exchange rate to that of a more developed country, then according to the trilemma, the smaller country is confronted with a choice: either it preserves the freedom to conduct monetary policy in the presence of capital controls, or alternatively it binds its monetary policy to that of the other central bank preserving free capital movements. If two countries had, for example, two different policy rates in the presence of free capital mobility, strong capital flows would add further pressure to break the parity.

Fig. 2 - The Policy Trilemma



Source: Source: Lars Oxelheim (1990). The chart is a reproduction appeared on The Economist.

So, how do cryptocurrencies fit within the latter? On the one hand, governments can shut down cryptocurrencies at any time. However, the main point here is that even if governments were to adopt a cryptocurrency as their legal tender, the Impossible Trinity would bind governments to stick to either option A or B in the chart above, effectively diminishing their “policy menu”.

These are two important reasons why we don’t expect a wide adoption of cryptocurrencies in the new future. In our view it is more likely to see progress on central bank-issued digital currency, which is the topic of a separate New Money article. Moreover, the blockchain technology underlying cryptocurrency remains promising. One area where we see a lot of potential is that of securities trading on a blockchain platform: security tokens, which we will also address in a separate New Money article.

New Money IV: Will central banks go digital?

The cryptocurrency hype may be fading, but central banks look better placed to make use of blockchain technology



Source: Shutterstock

Tech creates new opportunities for central banks

The crypto-bubble may have burst. But one lasting effect has been to force central banks to have a fresh look at their core functions of issuing money and conducting monetary policy. In this article, we focus on the potential for central banks to use technology to issue new forms of money. We see an increased probability that central banks will [issue their own 'digital currency'](#) in the medium term – say within the next five to 10 years.

Peer-to-peer cryptocurrencies such as Bitcoin were often explicitly aiming to disrupt the existing monetary order – central banks will aim for an evolutionary approach. In many ways, central bank digital currencies (CBDC) would simply be the latest in a long line of technological upgrades that central banks have been through over the years.

" We see an increasing probability that central banks will issue their own 'digital currency' in the medium term – say within the next 5-10 years."

? What is CBDC?

Most money used today is issued by commercial banks. Only notes and coins are issued by central banks, but their use is declining in many countries, which has sparked a debate about digital alternatives.

Central bank digital currencies (CBDC) could appear in many forms: accessible to the public or selected institutions only; administered as accounts or as tokens; anonymous or not; interest-bearing or without interest. Moreover, CBDC services provision can be partially or fully outsourced to private parties – as suggested by [IMF Managing Director Christine Lagarde](#). Arguably, 'wholesale CBDC' is already a reality: commercial banks have been digitally keeping reserves at central banks for decades. In contrast to notes and coins, reserves are only tradable during central bank opening hours while central bank digital currencies are supposed to be 24/7 from the start.

CBDC: What could happen?

We foresee the first developments in 'wholesale CBDC' (with access restricted to financial institutions only) to upgrade existing "[Real-time Gross Settlement](#)" (RTGS) systems (such as [Target2](#) in the eurozone and [CHAPS](#) in the UK).

This is not a game changer for domestic systems, which, despite their rather mature technology are efficient, and are being upgraded to 24/7 availability. Wholesale central bank digital currencies might make it easier to widen access to central bank funds to financial institutions beyond just banks – which may change the behaviour of interest rates and money markets, and so generate questions for monetary policy operations.

Internationally, the case for wholesale CBDC is more obvious, where it has the potential to [improve cross-border settlement between banks](#) – reducing the number of hoops required, taking away time zone impediments and speeding up transactions while reducing costs and scope for error.

"The case for wholesale CBDC is more obvious internationally, where it has the potential to improve cross-border settlement between banks"

Central bank digital currencies for all ('retail CBDC') could technically build on wholesale CBDC

systems while being more revolutionary in economic terms. Allowing all citizens to have universal access to the central bank balance sheet would rewire the financial system, creating new possibilities but also raising some new challenges for central and commercial banks alike. CBDC could make use of "[smart contracts](#)" embedded in the ledger. It could also allow for the implementation of a negative rate, potentially widening the existing monetary policy toolkit.

The introduction of a retail CBDC would have to be thought through very carefully, making it a technical, economic and political issue simultaneously

Commercial banks and central bank financial stability departments may worry about the increased ease with which depositors could move their money out of the banking system. CBDC would, in effect, be a new 'risk-free asset' with overnight maturity and high liquidity. This would have an impact on the demand for government bonds, in particular, ones with short maturities of less than a year, and on the functioning of wholesale funding markets. One effect could be to raise the cost of borrowing for banks and governments.

Universal-access CBDC could also intensify cross-border flights to safety in times of crisis, especially if only a subset of central banks go live with CBDC while others don't. This, in turn, would add pressure on foreign exchange markets. Imagine the next crisis and Switzerland issuing a universal-access central bank digital currency.

In sum, the introduction of a retail CBDC would have to be thought through very carefully, making it a technical, economic and political issue simultaneously.

"A retail central bank digital currency could technically build on wholesale CBDC systems while being more revolutionary in economic terms"

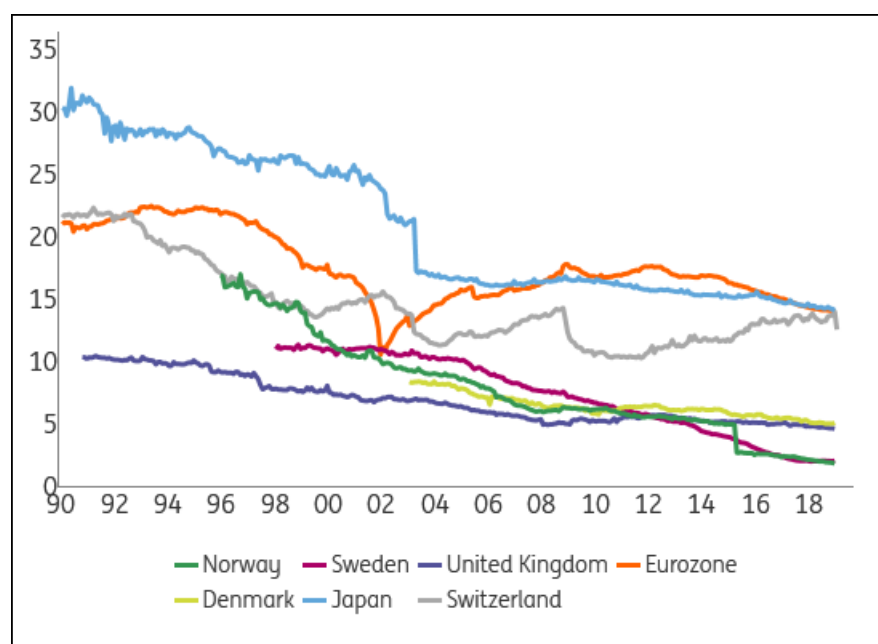
CBDC: Where could it happen?

Most central banks are [looking at digital currencies in some way](#). The [Bank of England](#), [Bank of Canada](#), [Riksbank](#) and the [Monetary Authority of Singapore](#) appear furthest ahead.

The thinking around retail CBDC may be furthest advanced where underground markets are problematic, or where the use of cash has dropped the most. On the latter, Norway, Sweden and Denmark come to mind. The circulation of cash, as opposed to bank accounts, has dropped to 5% or below in those countries as the chart below shows.

Cash in circulation as a percentage of M1

M1 is the sum of cash in circulation and current accounts. Redefinitions caused breaks in Japan in 2003 and in Norway in 2015.



Source: Central banks, Macrobond

CBDC: When could it happen?

We see five to 10 years as a realistic timescale. Obviously, there are all sorts of issues to solve first. On the one hand, there are difficult technical problems to address, especially given the need to ensure extremely high standards of reliability, alongside legal and political considerations.

Wholesale CBDC is more likely to come first, as this is largely within existing central bank mandates, and would only involve sophisticated institutions that, to a large extent, are already positive (at least in principle) about upgrading the existing settlement systems.

Retail CBDC is much trickier. Even where central banks are enthusiastic like [the Riksbank](#), it will require political decisions (e.g. privacy is a thorny issue, and CBDC is only recently gaining traction outside monetary circles). Central banks may also like digital currency for the more precise monetary policy operations it makes possible (e.g. directly imposing negative rates on cash holdings). This, however, is the same reason why [some citizens dislike the idea of CBDC](#). In any case, because it affects the whole population, CBDC will require an organisational and educational effort, aside from the considerable technical challenge.

Interesting times ahead

Universal access to central bank digital currencies raises a number of important questions that need to be researched thoroughly. This will take time. But wholesale CBDC may, both in technical and economic terms, be a relatively small step.

Its introduction may be only a few years away and could be considered a first step in the digital currency revolution.

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