16 February 2022

DIGITAL MONEY AND CENTRAL BANKS[1]

Roundtable Bulletin

CONTEXT

Digitalisation is having a profound impact on the financial landscape. There are many dimensions to this change, but the underlying seismic shift is in the ability to collect and exploit information embedded in data on customers and their behaviour. As a result, the comparative advantage that incumbent financial institutions have had in extracting rents from informational asymmetries is being eroded.

Nimble operators, some unregulated and entirely outside the financial sector, are better placed to measure, monitor and manage the risk from large data sets and thereby to engage in activities traditionally associated with authorised deposit-taking institutions. Digital technologies provide the scope for vast improvements in payments, in principle facilitating instantaneous settlement, 24/7, anywhere in the world and often using new forms of 'money'.

Simultaneously the public, led by the young and the tech-savvy and further impelled by the pandemic, have come to appreciate the convenience of digitally-based payments services. The fact that anyone anywhere with a mobile phone can enter the financial ecosystem is a powerful accelerator. There is growing disenchantment with the costs, inconvenience and sense of elitism of legacy arrangements. Since the use of payments systems depends on network effects, it would not be surprising for a small number of large service providers to dominate the market once a tipping point is reached. It is too early to say when that might happen. The speed of the transformation now in train is breath-taking. The uncertainties and unknowns as regards the behavioural implications pose multiple policy challenges.

Up until now, the overall approach of authorities across the globe has been to let many seeds sprout and to regulate on the basis of "Same business, same risks, same rules" - once they become invasive weeds. This has the advantage of permitting and even fostering innovation while making it clear there are limits.

The changes occurring have implications for central banks in both mature and emerging economies. Central banks in the latter could face the prospect of a declining relevance or

[1] Synopsis of themes considered at a Roundtable discussion in December 2021. The views expressed do not necessarily reflect those of the participants. Roundtable discussions take place semi-annually. Participants have included Vitor Constancio, Charles Goodhart, Stefan Ingves, Jacques de Larosière, Erkki Liikanen, Donald Kohn, Guillermo Ortiz, His Highness Mohammed Sanusi II, Andrew Sheng, Masaaki Shirakawa, Sir David Walker and Dr Zeti Aziz. The discussions are moderated by Dr Gavin Bingham and Sir Andrew Large.

ability to deliver domestic monetary policy should existing fiat arrangements be displaced through rapid, digital dollarisation. This is not an issue limited to the decline of notes and coin usage. Rather it reflects the fact that authorised banks are built on the bedrock of electronic currency issued by central banks. Even mature economies could see crypto assets displacing the use of electronic fiat currency.

In other developments, AI-driven algorithmic trading increasingly dominates many financial transactions, including those in which central banks conduct their money market operations. Tech start-ups achieve unicorn status without even ever having generated a profit, making the gulf between the appropriate discount rate for expected future returns and the short-term rates central banks use in their operations larger and more volatile. The calibration of monetary policy is thus more difficult in an environment where the potential for unexpected financial instability must be faced.

The focus of this Bulletin is on three identifiable categories of digital money which, to varying degrees, serve as units of account, means of payment, and stores of value. The first two (crypto assets and stablecoins) are private; the third (central bank digital currencies (CBDCs) is public.

Private digital money

A variety of forces are driving the development of private digital currencies. These include

- The capacity to make payment and settlement cheaper and more efficient, particularly across borders.
- The desire to exploit the information contained in data on the possession and use of money.
- The dream by some of taking the power to manipulate money away from the state.
- The ambition of preserving privacy in transactions.

Many of these developments are being driven by individuals and corporations based in the United States, where the economic, technical and political conditions that foster these forces seem to coalesce. On the other hand, it is China where the State is responding most strongly to control them.

Crypto assets

So called “crypto currencies”, like many non-fungible tokens (NFTs) and some other similar digital claims, tend to be **algorithm based**. Some are tokens like *Bitcoin*; others are liabilities that can be extinguished through smart or conventional contracts. Trust in crypto assets depends on the IT: in confidence that the algorithm and processes for verifying it are sound (and ecologically sustainable). There is considerable scepticism that these “crypto assets” truly possess the qualities to be viewed as money, even as they are entering the mainstream as a speculative asset.

There is no intrinsic value in such crypto assets; value arises because it is accepted by others (“beauty lies in the eyes of the beholder”). If trust or hype evaporates, as seems likely with meme money, such as *Dogecoin*, so too will the value. The timing may be unknown. But to

the extent that this could lead to instability, precautionary measures or mitigation may be necessary.

Some of the most ardent proponents of crypto currencies claim that the world of state-issued public money ('fiat money") is in disarray. They point to the huge accumulation of sovereign debt, much of it held by central banks, the quasi-monetary financing background to this, the risk of inflation and a policy trap from which central banks are struggling to escape.

Bitcoin and its clones purportedly provide the comfort of supply restraint, which can spawn the trust that is essential. Of course, there is an unlimited supply of the clones which refutes the supply limit. Nevertheless, the proponents see such digital assets being used in place of conventional currency, providing all the services presently on offer and more, allegedly without the need for or costs of the unwieldy intermediaries of today.

Apart from concerns about the high ecological costs associated with "mining" and fears about its use for illegitimate transactions, the primary reason for thinking that *Bitcoin* will not supplant public money is the volatility of its purchasing power. This hampers its chances of being generally accepted as a means of payment and makes it more likely that it will be seen as just another speculative asset. Sharp price swings do not necessarily dull demand for speculative assets, particularly when uncorrelated with changes in the price of other assets. Indeed, this feature has made *Bitcoin* and its relatives attractive for investors seeking to manage risk through diversification.

Stablecoins

Stablecoins are designed to address the problems associated with the price volatility of crypto assets. Their value is based on reliance on predictable and rapid conversion into reserves of unquestioned quality and hence the integrity of that conversion. Ironically, this surety is given in terms of traditional assets measured in fiat money values.

Early attempts by Big Tech and other backers to develop a global digital currency came to nothing in the face of concerted official sector discouragement. However, stablecoins in some form have the potential to disrupt existing currency arrangements, especially in emerging markets and developing countries where they might fuel dollarization.

The bulk of existing stablecoins are denominated in national currencies, with the US being the only jurisdiction where private issuance of stablecoins has taken place at any scale (presently about 5 percent of currency in circulation and hence a tiny fraction of the broad money stock). Their primary use is in transactions involving crypto assets rather than those involving goods and services. They present a spectrum, with some, such as *USDC* and *Paxos*, arising from applying a narrow banking model in a digital age so that they become deposit-like. Others such as *Tether*, the oldest of the stablecoins, do not provide such reliance on value or liquidity and can be thought of more as money market funds.

Regulation of private "money"

The prospect that private digital assets will achieve a scale that has implications for the integrity of markets and the execution of public policy raises question of how they should be regulated and who should regulate them.

Crypto assets and stablecoins raise issues of ownership, verification and smart contracting, like other tokens such as NFTs. They could be regulated in various ways, including:

- As deposits – recognising that they are like deposits in a narrow banking world
- As securities – recognising that they are like MMFs
- As options – recognising that they constitute a future claim
- As means of payment – raising questions of substitutability with cash and deposit money
- As "snake oil" – requiring consumer protection

Concerns have also been expressed by regulators about the need for, and best means of, regulation of wallet providers and coin exchanges. Their very location can be hard to define, but they constitute critical nodes between legal tender and digital currencies. They have a symbiotic relationship with private digital money issuers. Indeed, they are akin to today's derided intermediaries.

While the canon of "same business, same risks, same rules" foresees a level playing field, its application is bedevilled by radical differences in business models between traditional and pioneer suppliers as well as by turf disputes between regulators with different mandates, including payment systems regulators, central banks, banking regulators, securities regulators, competition authorities, market conduct authorities and cybersecurity agencies. The latter have recently been particularly active in China, initiating the regulation of algorithms governing the use of information garnered by payments suppliers.

All the main jurisdictions are developing approaches:

- The US President's Working Group on Financial Markets has issued recommendations on how to treat privately issued digital "money" as stablecoins[2]
- The EU has prepared a proposal for a *Markets in Crypto-Assets Regulation* (MiCAR[3])
- The Chinese authorities banned all crypto trading in September 2021. They are also the most advanced in rolling out a public money CBDC substitute for stablecoins (the e-CNY), which they plan to showcase at the Winter Olympics, 2022.

Meanwhile, the G7 and the FSB[4] have both issued reports on stablecoin regulation.

[2] See https://home.treasury.gov/news/press-releases/jy0456 accessed 16 January 2022
[3] See https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0593 accessed 13 October 2021.
[4] See https://www.fsb.org/2020/10/regulation-supervision-and-oversight-of-global-stablecoin-arrangements/ and https://www.fsb.org/2021/10/fsb-publishes-progress-report-on-the-regulation-supervision-and-oversight-of-global-stablecoin-arrangements/, both accessed 13 October 2021.

Public digital money

Today most central bank money is digital – at least in developed economies. Extensive rounds of asset purchases (QE) have increased the supply of money held in commercial bank reserve accounts at the central bank. Bank deposits themselves resemble public digital money to the extent that the regulatory process and deposit insurance arrangements for the banks are effective,

Currency in circulation is the only item worthy of note on the central bank balance sheet that is not digital. It is now a much smaller proportion of the total than it was and is less used in transactions because of improved existing payment mechanisms such as debit and cards, as well as digital money usage.

The issuance of Central Bank Digital Currencies has been minimal, but there is widespread interest in, and exploration by central banks of, the feasibility of issuing them both to retail and wholesale. In Sweden, it was prompted by the decline in the stock of currency in circulation[5]. Switzerland has conducted experiments involving the settlement of interbank, monetary policy and cross-border transactions using wholesale CBDCs. Several smaller countries such as Bahamas have commenced experiments. Larger EME's such as Mexico are close behind.

Policy Implications

Financial stability

Private digital money

Just as prudential regulation is currently needed to preserve financial stability in the banking system and the deposits within it, so too will stablecoins, or other crypto assets which purport to have deposit-like qualities, require similar forms of regulation. Those which are more MMF-like will require regulation for the same reason.

Crypto currency such as Bitcoin takes on both a conduct dimension as well as the systemic dimension. Overall, financial stability could be threatened in the event of a confidence-led crash in such crypto assets, just as in other significant asset classes such as house prices or equities.

Public digital money

CBDCs are likely to garner more trust than private digital money. However, to preserve stability they need to be issued in ways that would avoid a sudden disintermediation of the incumbent banks - which could otherwise cause classical runs. In terms of preparations for systemic

[5] The decline in Sweden took place over a 10-year period from 2007 and has since levelled off. It seems to have been driven in part by the abolishment of inheritance and wealth taxes in 2005. In most countries, the stock of currency in circulation has not declined even though its use in transactions has – it is still being used as a store of value, and for precautionary purposes. In most countries, the onset of the pandemic resulted in a step increase in currency in circulation.

events or their mitigation, central banks are more likely to both understand the issues and be willing and able to invest in robust systems than private issuers of money. The risk of runs into CBDCs, as well as any consequent potential risk in the event of rapid withdrawal of incumbents, that Central Banks might become involved in credit allocation, could be managed by setting limits on holdings at the retail or nonbank institutional level.

Failure of payment systems, exchanges and other providers could also lead to instability. Regulation will need to be considered from analysis of the risks that each of them pose.

Monetary policy

The impact of digitalisation on the ability to conduct monetary policy will depend on whether private digital money issued by tech companies or other nonbanks becomes a substitute for bank deposits. Monetary policy credibility and the control of inflation expectations do not rely on the control of physical payment instruments such as cash. But they do rely on the price and/or quantity of central bank money affecting the economy, with the most direct channel being via the banking system.

Crypto assets can act like a foreign currency. If they have a fixed exchange rate either directly or, as with stablecoins, are underpinned by an asset that is priced in domestic currency, then they can be subjected to normal monetary policy influences via that conversion. But if they do not have a fixed relationship to any domestic currency asset, then the use of a crypto asset for transactions would be akin to use of a foreign currency, with the added complication of not being subject to banking regulations since bank accounts need not be part of the crypto system. For some developing or emerging market countries, crypto assets linked to the dollar could be a new, less controllable, form of dollarization. And even the US dollar could be substituted away to some degree. As yet, this seems to be more of a theoretical possibility, but crypto markets are rapidly evolving.

If private digital money were to substitute only for banknotes and coins, there would be no monetary policy implications and no monetary policy reason to issue CBDCs, as central banks do not rely on operations in physical money to conduct policy.

If the basis for the stablecoin were an algorithm or assets denominated in some currency other than the domestic currency, there is the risk that the economy could be “dollarized” – an issue already acute in some countries with fixed exchange rates or with high inflation.

Either of these two states of affairs could upset monetary policy as presently conducted, or otherwise impact the control of the economy by the jurisdiction concerned.

Innovation and efficiency

The private sector has a comparative advantage in fostering innovation and, subject to the need to avoid instability, central banks should be careful not to stifle inventiveness, particularly in the area of cross-border money transfers and provision of payments services to the unbanked or “unteched”. They nonetheless need to be mindful of potential detrimental effects. Finding a middle way between encouraging innovation and enhancing their own

understanding of it and its implications whilst avoiding risks that could generate huge fiscal cost will not be easy. Sandbox approaches to new forms of digital money in controlled circumstances, are useful to understand the implications. There will also be a premium on the regulator having skills that combine a basic understanding of the IT issues with the policy implications.

Efficiency needs also needs to be understood in a wider social sense. The casual meeting of people as they visit their local bank branch to withdraw cash or pay bills, and the nod of the shop assistant who gives the customer her change, provide a subtle hint of humanity that is absent when payments are digital.

Privacy and confidentiality

The issue here is about who, if anyone, should have access to information imparted by the possession and use of money. There is a concern that data contained in digital money will be exploited by private issuers or autocratic states in ways that are manipulative, socially divisive or repressive. At the same time, the information contained in data on payments can be used legitimately to hone monetary policy and to deter criminal activity taking place under the cloak of anonymity.

The history of privately-issued money[6] has demonstrated time and time again that private money, unless strictly controlled, leads to bedlam. Although there is ample evidence of failed fiat currencies, their overall record is better, at least in peacetime. This is partly because preservation of the monopoly power over money creation – or having regulation in place so that they can rely on someone else's – gives the authorities the levers of control of the economy with which we are familiar.

Emerging markets

Authorities – including central banks - in emerging markets face a different and arguably more pressing set of issues. This is in part because some of them face greater challenges in achieving trust in their currencies than reserve currency countries, but the primary reason is the penetration of big tech. Nine out of ten of *Facebook*'s largest national markets are in major emerging markets. There are more than 350 billion *Facebook* users in India alone, and in several emerging markets, many more people have *Facebook* accounts than bank accounts. As a result, there is a non-trivial prospect of the substitution of local currency by a *Diem* or similar private digital currency issued by Big Tech. It is not mere coincidence that some emerging markets have moved farther and faster in adopting digital currencies in some form than developed countries have.

The asymmetries in knowledge between Silicon Valley and public policymakers also need to be considered. Although there is no need for policy makers to have professionally qualified IT

[6] Please refer, for example, to Gary B. Gorton and Jeffery Y. Zhang (2021) Taming *Wildcat Stablecoins* (17 July 2021). Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3888752.

expertise (which can be bought in), they do need to be able to visualise how digital developments will impact human behaviours and the risks to which these can give rise.

CONCLUSIONS

Digitalisation will continue to have a significant impact on the financial system. The overall approach of monitoring developments, seeking to understand their implications and exploring alternative approaches is warranted. When activities expand in scope and scale to have systemic implications, regulation is often needed. Such regulation should be tailored to the nature of the activity and the risks entailed.

The general objectives of permitting innovation, applying equitable standards so that the same functions, whatever the form, are subject to the same rules, and preserving the capacity to perform public policy functions remain valid. This will presumably mean that stablecoins will be subject to appropriate regulation, depending on the nature of the stablecoin. A two-tier system of public and private money will most likely persist, but the entrance of new suppliers of private money will require central banks to consider the scope and nature of the liquidity provision and lender of last resort functions.

While the disappearance of currency in circulation would be unlikely to have significant implications for core central banking functions, the disappearance of banks that issue demand deposits would. Central banks are therefore right to explore the advisability of issuing central bank digital currencies, which the Swiss now see as being hardwired into existing payments and banking systems.

Central banks have traditionally exercised monopoly power over money creation. That has underpinned their relevance and ability to deliver the key objectives of monetary policy and to contribute to financial stability. This has been to the benefit of society generally. Those objectives will retain their importance as the digital transformation occurs. Just how they are to be delivered is unclear. The tools with which we are familiar may require adaptation or new tools may be needed. For central banks, adjusting to the digital age of money will be a third challenge on top of those of exiting the QE trap and responding to the climate change agenda. How they respond to these will collectively determine their relevance in the future.