
6 Digital money: Private versus public

Markus Brunnermeier and Dirk Niepelt

Princeton University; Study Center Gerzensee and University of Bern

The financial system is undergoing fundamental change. Fintechs and bigtechs are pushing the technological frontier, redefining business models, and forcing banks to adapt. In parallel, new forms of money and alternative payment systems are emerging. Alipay, Apple Pay, Bitcoin and new types of digital central bank money compete with traditional bank deposits. What are the macroeconomic consequences of these new means of payment? We address five key concerns that are frequently put forward:

1. Aren't digital currencies just a hype, now that crypto 'currencies' like Bitcoin have proved too volatile and expensive to serve as reliable stores of value or mediums of exchange? This confuses things. A central bank digital currency (CBDC) is like cash, only digital; Alipay, Apple Pay, WeChat Pay, and so on are like deposits, only handier; and crypto currencies are not in any way linked to typical currencies, but they live on the blockchain.
2. Doesn't a CBDC or 'Reserves for All' choke investment by cutting into bank deposits? No, because new central bank liabilities (namely, a CBDC) would fund new investments, and this would not in any way imply socialism or a stronger role of government in investment decisions.
3. Wouldn't a CBDC cut into the profits that banks generate by creating deposits? Less money creation by banks would certainly affect their profits. But if this were deemed undesirable (by the public, not by shareholders and management) then banks could be compensated.

4. Wouldn't 'Reserves for All' render bank runs more likely, undermining financial stability? We argue that, in fact, the opposite seems more plausible.
5. Aren't deposit insurance, a CBDC, Vollgeld/sovereign money, and the Chicago Plan all alike? There are indeed close parallels between the different monetary regimes. In a sense, "money is changing and yet, it stays the same".

Let us be more explicit.

Crypto is private digital money, but different

Apple Pay, Alipay, M-Pesa and other monies issued by fintechs and bigtechs typically constitute claims to central bank money, or claims to claims to central bank money, or claims to claims to claims to... In this respect, they parallel traditional bank deposits, which also represent commitments to deliver central bank money. Most crypto currencies are different. They do not promise euros, dollars, or Swiss francs (unless their issuers actually invest in fiat currencies and render the crypto stuff redeemable). In fact, the prices of crypto currencies fluctuate wildly relative to the prices of monies issued by central banks. This makes crypto currencies much less useful as means of payment but maybe more useful for hedging purposes (or as easy-to-hide stores of value). From a macroeconomic point of view, crypto currencies pose similar challenges to policy makers as dollarisation – the national currency loses its singularity and, as a consequence, the central bank part of its influence over domestic monetary conditions.

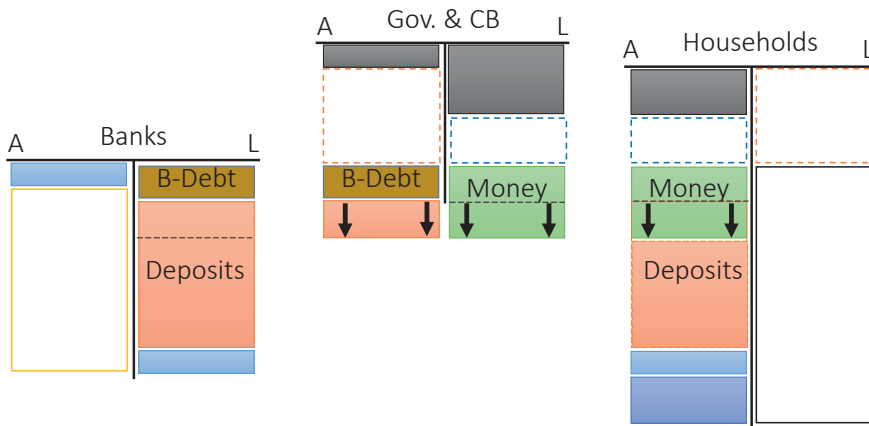
While crypto currencies are quite different from the money issued by banks, they are even more different from central bank-issued money. What would happen, then, if central banks were to issue digital money for the general public, 'Reserves for All', as suggested for example by Tobin (1985, 1987)?

'Reserves for All' would neither choke investment nor herald socialism

True, if people were to swap some of their bank deposits into a CBDC then banks would lose a source of funding. But the central bank would gain funds, and these would have to be invested somewhere. The central bank could start funding real investment – an experiment in ‘socialism’, and likely a bad one because private banks are arguably better equipped to screen loan applications and monitor projects (and better insulated against political pressure). Alternatively, and preferably, the central bank could pass the funds through to commercial banks, effectively leaving the environment for banks completely unchanged. The important point to note is that a substitution of monies (a CBDC for deposits) only requires new sources of bank funding, not new ownership and control over real assets.

Figure 1 illustrates the effects of the pass-through operation on the balance sheets of banks, the central bank, and households.

Figure 1 The pass-through operation



Notes: The arrows in the green rectangles indicate that households hold fewer deposits but more central bank-issued money, for example in the form of a CBDC. The central bank passes the funds through to banks by holding more deposits, as depicted by the arrows in the red rectangle on the asset side of the central bank's balance sheet.

Banks can be compensated

When issuing deposits in exchange for loans or other assets, banks typically borrow cheaply and lend dearly. (Today, there are some exceptions to this rule as some central banks charge negative interest on the reserves banks hold with them while deposits mostly pay non-negative interest.) Deposit holders go along with this because bank money is useful not only as a store of value but also as a means of payment – money has liquidity value. By creating this value out of ‘thin air’ (subject to limitations), banks generate seignorage profits. Less bank money creation would eat into those profits.

Some may consider that unfortunate, because they like bank shareholders or are worried about banks’ capital base. Others might like it. In any case, the distributive implications of replacing commercial bank by central bank issued money are manageable – banks could easily be compensated if this were so desired.

‘Reserves for All’ may not increase the risk of bank runs

A frequently made argument against the introduction of a CBDC points to the danger of increased run risk. According to this argument, a CBDC would not foster ‘traditional’ bank runs where non-banks try to withdraw deposits and convert them into cash. Instead, it would give rise to a novel form with volatile deposit withdrawals in response to swings in sentiment and shifts into a safe-haven CBDC since such swaps would be very easy to conduct and nearly costless.

It is far from obvious, however, whether the introduction of a CBDC would make bank runs more likely. First, when the central bank issues the CBDC and passes funds through to private banks, then the central bank becomes a large, possibly the largest, depositor. But a large depositor that pursues an optimal policy internalises the run externalities and therefore might refrain from running itself. As a consequence, the incentives for the remaining small depositors to run also fall. Hence, a CBDC combined with pass-through funding can make runs *less* rather than more likely.

Second, with the CBDC the central bank gains an informational advantage because it immediately learns from fund inflows when a run is about to start. The central bank can therefore engage more quickly as a lender of last resort, it can more easily prevent

costly fire-sales, and it can better prevent a liquidity problem from morphing into a solvency crisis. If the remaining depositors are aware of this ability to intervene earlier, and more effectively, then they may become less wary themselves, which again reduces the risk of a deposit run.¹

A related question is whether the central bank would lose control over its balance sheet once the CBDC is introduced. Indeed, a central bank that passes through funds from non-banks to banks lengthens its balance sheet, and if the volume of funds varies over time, so does the length of the balance sheet. There is no reason, however, to be concerned with the length of the central bank's balance sheet per se (especially if some items on the asset and liability side net out) except for the implications on credit risk exposure. This exposure can be minimised with the appropriate collateral policy.

If today, deposits are perfectly liquid and risk-free because of unconditional deposit insurance backed by government guarantees and a lender of last resort, then a CBDC combined with pass-through funding would simply make implicit government guarantees explicit. If deposits are risky, in contrast, then the newly introduced CBDC would have to be accompanied by transfers or taxes in order to exactly replicate outcomes under the contemporaneous regime. In either case, the net wealth and liquidity positions of agents would remain unchanged even if their gross positions reflected in balance sheets might change.

The Chicago Plan, narrow banks and sovereign money (Vollgeld)

The Chicago Plan from the 1930s (Knight et al. 1933, Fisher 1935, 1936), which argues in favour of narrow banks, simply amounts to an introduction of a CBDC that fully replaces deposits. As described above, one way to end fractional reserve banking without changing equilibrium outcomes would be for the central bank to supply deposits – at the same price and conditions as depositors currently do – to banks. This is not what

1 The central bank may also set an unattractive (possibly negative) interest rate on CBDC accounts to avoid that the CBDC is more attractive than cash as a safe-haven asset. Of course, the central bank has to be careful that changes in the CBDC interest rate do not serve as a coordination device for households to start a run.

the proponents of the sovereign money (Vollgeld) proposal envision. According to their proposal, banks should no longer issue deposits but fund themselves from different sources instead. Banks would lose a source of profits – seignorage rents from liquidity creation – and change their policies, with potential implications for macroeconomic outcomes. Of course, it is not clear how the abolition of money creation by banks could ever be enforced in the first place.

Money is changing and yet, it stays the same – an equivalence benchmark

In a recent paper (Brunnermeier and Niepelt 2019), we make this discussion precise. We show formally that as long as a CBDC can serve as a (not necessarily efficient) means of payment for some transactions currently conducted with deposits, a swap of the former for the latter does not have macroeconomic consequences as long as certain conditions are satisfied. Our equivalence result should be construed as a benchmark result that helps to organise one’s thinking about complex economic relationships, in the spirit of Modigliani and Miller (1958), Barro (1974), and many other equivalence results in economics. There may exist only a few circumstances under which the sufficient conditions for equivalence literally apply; nevertheless, they give a clear sense of possible sources of non-equivalence in real-world settings.

Maybe the most restrictive condition for the irrelevance of a swap relates to politics (Niepelt 2018). Irrelevance would require, for example, that political decision makers are willing to compensate bank owners for the losses they suffer due to reduced seignorage profits. We doubt that voters would accept this. In fact, one important motivation for the Vollgeld (sovereign money) initiative recently rejected by Swiss voters was to shift rents from banks to taxpayers.

Whether a *non*-neutral monetary reform would be for the better or the worse is a question that our equivalence result cannot address. Answering this would require an explicit characterisation of equilibrium in model economies, as well as serious quantitative and welfare analyses. For policy discussions about monetary reform, we therefore do not propose a set of definite answers, but an analytical framework and a robust road map.

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About the authors

Markus K. Brunnermeier is the Edwards S. Sanford Professor at Princeton University. He is a faculty member of the Department of Economics and director of Princeton’s Bendheim Center for Finance. He is also a research associate at NBER, CEPR, and CESifo and a member of the Bellagio Group on the International Economy. He is a Sloan Research Fellow, Fellow of the Econometric Society, Guggenheim Fellow and the recipient of the Bernácer Prize granted for outstanding contributions in the fields of

macroeconomics and finance. He is/was a member of several advisory groups, including to the IMF, the Federal Reserve of New York, the European Systemic Risk Board, the Bundesbank and the U.S. Congressional Budget Office. Brunnermeier was awarded his Ph.D. by the London School of Economics (LSE). His research focuses on international financial markets and the macroeconomy with special emphasis on bubbles, liquidity, financial and monetary price stability.

Dirk Niepelt is director of the Study Center Gerzensee, professor at the University of Bern, and research fellow at CEPR and CESifo. He was an invited professor at several universities, held visiting positions at the ECB and the IMF, and served on the board of the Swiss Society of Economics and Statistics. Prior to completing his doctoral education, he worked at applied research institutes. Niepelt received his PhD in economics from the Massachusetts Institute of Technology and holds licentiate and doctorate degrees from the University of St. Gallen. His interests in economics include macroeconomics, international economics, and public finance.