

Digital currency. Design principles to support a shift from bankmoney to central bank digital currency

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Abstract

Central bankers as well as monetary reformers are discussing the introduction of central-bank issued digital currency in coexistence and competition with bank deposits (bankmoney). Among the reasons for this are the gradual disappearance of cash and a far-reaching loss of monetary control. However, a general shift to digital currency (DC) cannot be taken for granted. The paper discusses the conditions and design principles that are tipping the scales in the competition between bankmoney and DC.

Relevant issues include access to and available quantities of DC, mutual convertibility of bankmoney and DC, parity of bankmoney with DC, how to deal with bank run situations, central-bank support and government warranties for bankmoney, deposit interest on DC, and the question of negative interest on DC.

JEL codes E42, E52, E58, G21

Key words digital currency, central bank digital currency, DC, CBDC, sovereign money, monetary policy, bankmoney, deposit money, cryptocurrency

Digital currency: cryptocurrency or money-on-account?

People have become used to hearing about digital currencies (DC) such as Bitcoin. These currencies are based on new technology known as distributed ledger and blockchain technology and are also referred to as cryptocurrencies because of the data encryption involved. Cryptocurrencies represent a radical alternative to the current banking system, in that they bypass retail banks and defy central-bank control from the outset.¹

Against this background, central banks are now thinking about producing their own DC. Initially, such central-bank issued DC was imagined in the technical form of cryptocurrency.² The new technology, however, is still in its infancy.³ In comparison, tried and tested ways of managing account balances and payments from and to accounts are well suited for implementing DC. In the foreseeable future, central-bank issued DC is thus likely to take the form of account balances (money-on-account). In this context, “digital money” and “electronic money” are interchangeable terms.

First design studies of DC were put forward by Barrdear and Kumhof of the Bank of England, the Swedish Riksbank and the Basel Bank for International Settlements, and were also presented at an early stage by monetary reformers and other economists.⁴ The number of

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¹ See Carney, 2018.

² Cf. Andolfatto, 2015; Danezis and Meiklejohn, 2016; Bech and Garratt, 2017.

³ Related problems include the high volatility of cryptocurrencies, which arises from being used as speculative casino tokens rather than a general means of payment. The transfer of cryptocurrencies is not yet sufficiently fast, and is much too energy-intensive and thus expensive. Crypto trading platforms are vulnerable to hacker attacks, and legal questions of liability and identifiability are not entirely settled.

⁴ Barrdear/Kumhof (BoE) 2016 pp. 3-18, Kumhof/Noone (BoE) 2018 pp. 4-22, 35-37, Sveriges Riksbank 2017; 2018, 2018b; Ingves (Sveriges Riksbank) 2018; Dyson/ Meaning (BoE) 2018; BIS, 2015; 2018;

central banks and international monetary institutions that have expressed an interest in DC has been steadily growing.⁵

DC is conceived of as a means of payment in general use among nonbanks, similar to traditional cash. The use of central-bank digital or electronic money would thus no longer be the privilege of banks in the interbank circulation (where DC is called “reserves”). Instead, DC would basically become available to everyone. In public circulation, DC is intended to circulate in parallel and in competition with bankmoney (i.e. bank deposit money, generally referred to as sight or demand or overnight deposits). Bankmoney side by side with DC is comparable to the familiar co-existence of bankmoney with cash.

At the beginning, this may not involve immediate individual access by nonbanks to the central bank payment system. As long as there is not a comprehensive infrastructure of DC accounts, payment service providers (including banks providing such services) can manage the DC of customers in custody as a separate trust asset. DC can also be managed by using mobile apps and e-cash cards.⁶ This does not exclude the future application of cryptographic technology to managing DC.

People and organisations would opt to maintain their present bankmoney account (bank giro account), or to use a DC device or digital currency account as the new alternatives, or to use bankmoney and DC in parallel, depending on the prevailing conditions and individual preferences. However, the introduction of DC in public use is bound to face a variety of possible obstacles and problems, as discussed hereafter.

Motives behind and advantages of DC

The reason for considering DC in Sweden is the provision of a modern central-bank-issued means of payment as a successor to traditional cash, which has fallen almost into disuse in the country. An unspoken worry related to the long-term decline of cash is that a central bank with no central-bank money in public circulation might seem somewhat redundant, sort of King Lackland.

Today, bankmoney has marginalised central-bank money (cash and reserves) in all advanced countries, presently at the ratio of 85–95% bankmoney to 5–15% cash. Overnight bankmoney and cash together represent the monetary aggregate M1.⁷ The actual share of cash is even smaller as more than half of it is not in active circulation but held as a safety buffer or, in the case of the US dollar and the euro, used as a parallel currency abroad.⁸ This is even more pronounced for the US dollar. Statistically, US cash still represents 45% of M1, but most of these dollar notes are held abroad.⁹ Put differently, cash does not count for much any longer

Bech/Garratt (BIS) 2017; Niepelt (Swiss National Bank) 2015; 2018. Pioneering inputs from monetary reformers were made by Dyson/Hodgson 2016; Wortmann 2016; Yamaguchi/Yamaguchi 2016; Huber 2017a pp. 188-190. Other economists supporting DC include Bordo/Levin, 2017; Bordo, 2018; Eichengreen, 2017; Roubini, 2018.

⁵ Recent studies include IMF, 2018 and Central Bank of Iceland, 2018. Also see BIS 2019, a survey on central-bank attitudes towards DC.

⁶ Cf. Kahn/Rivadeneira/Wong 2018, Ingves, 2018, 4 [9], Sveriges Riksbank, 2018, p.15.

⁷ ECB, *Economic Bulletins*, Tables 5.1.

⁸ Esselink/Hernández, 2017; Krueger/Seitz, 2014, p. 7; Rogoff, 1998.

⁹ <https://fred.stlouisfed.org/series/M1SL/TCDSL> .

and has lost its systemic importance anyway due to the primary creation of bankmoney and related fractional amounts of central-bank reserves.

Furthermore, money market fund shares (MMF) are now used as a deposit-like new money surrogate, largely based on bankmoney. MMF amount to more than two times M1 in the U.S. and a third of M1 in Europe.¹⁰ It is unclear exactly how much of that is used as a means of payment. Furthermore, new types of securitisation help liquidate capital that would otherwise be idle. This does not create new money surrogates, but does accelerate the circulation of money in the financial economy, which has the same effect as an increase in the stock of money.

Taken together, these and other developments (such as, for example, ongoing market concentration in the banking sector) make central-bank cash and reserves an almost insignificant factor, indicating the dwindling influence of conventional monetary policy on banking and finance. If the shift towards bankmoney could be reversed, however, resulting in a growing proportion of central-bank money, the transmission lever of conventional monetary policy could be expected to become correspondingly more effective again. A working paper by Bank of England staff Dyson and Meaning emphasises the potential role of DC in restoring a higher degree of central-bank control over the existing stock of money, and thus improving the transmission of monetary policy to banking and finance.¹¹

Another fundamental advantage is the complete safety of DC as it represents central-bank base money in full, not a money surrogate such as second-level bankmoney (a mere promise to pay central-bank money on demand) and third-level MMF (a promise to pay bankmoney). In contrast to DC, bankmoney is inherently unsafe and must be backed by a number of auxiliary constructions of uncertain reliability and questionable legitimacy such as, for example, deposit insurance and government bail for bankmoney.

The reason for the structural non-safety of bankmoney is its just fractional base of cash and reserves. The respective fraction amounts to 2.5–3% of the stock of bankmoney in the euro area, consisting of 1.4% vault cash, a 1% largely idle minimum reserve requirement and 0.1–0.6% excess reserves (active interbank payment reserves, depending on a bank's size). In the countries of the British Commonwealth and a number of other countries, minimum reserves no longer exist. In the U.S., there is still a formal reserve requirement of 10% minus vault cash. However, the majority of banks (the smaller ones) is unbound by reserve requirements, certain positions such as large time deposits are generally exempt from the requirement, banks are allowed to temporarily “sweep” deposits into accounts that are not subject to reserve requirements and the Fed, furthermore, pays deposit interest on reserve balances (as most central banks now do). As a result, the actual U.S. reserve requirements have “rapidly been losing relevance” and are now near the vault cash.¹²

Adding to the safety of DC, the counterparty risk in bank payments is eliminated as DC payments are made directly from the payer to the payee (without connection to the interbank circulation of reserves). DC would thus enjoy a higher level of trust and acceptance than bankmoney, in spite of central-bank support and state warranty for the latter. As far as DC is concerned, there is no longer a need to prop up banks in a crisis in order to save the nation's money and to maintain payment transactions. The safer money is, and the

¹⁰ Huber, 2017a, p. 111.

¹¹ Dyson/Meaning, 2018.

¹² Bennett/Perestiani, 2002, pp. 53, 65.

more stable the monetary system, the more this will contribute to overall financial and economic stability.

In terms of comfort and costs, the handling of DC and bankmoney is the same, and also the costs of handling DC are likely to be equal to those for bankmoney. The relatively high costs of handling cash cease to exist.

Regarding the costs to the banks for funding DC, the situation is comparable to that of cash. For a long time banks managed with cash-to-bankmoney ratios of 70, 50, 30 per cent. Why would they then have problems dealing with ratios for DC of 30, 50, 70 per cent? If profit margins from bank lending and security purchases are somewhat reduced, this reflects a corresponding reduction in today's bankmoney privilege.

Another advantage, particularly for the public purse, is increased seigniorage in proportion to the stock of DC. No matter how DC enters circulation, banks will have to finance that money in full, in the same way as for cash. Even under conditions where bankmoney is still predominant, this will result in an increased amount of seigniorage.

Problems with the coexistence of DC and bankmoney

Impaired ability of banks to lend and invest?

One of the concerns that have been expressed about the introduction of DC is that with a growing share of DC “deposit-funded bank credit might be undermined”¹³ and that “with too widespread a DC, it might threaten the banks’ lending activity, if banks cannot use deposits for that purpose”.¹⁴ Such statements are totally missing the point. Under fractional reserve banking, deposits are not loanable funds for the banks, and banks are not financial intermediaries but creators, de- and re-activators and extinguishers of bankmoney.¹⁵

The proposals published so far do not intend to strip banks of the privilege to create themselves the money on which they operate in their business with nonbanks. The banks’ ability to create bankmoney at their discretion will fully be maintained rather than impaired – and this is what creates problems in the first place.

A new problem that could arise, however, is a temporary shortage of eligible securities if customers demand too much bankmoney to be converted into DC in too short a time. This is analogous to a bank run, representing a run on DC rather than traditional cash. In either case, the problem continues to be the in-built lack of bank liquidity and easy-to-liquidate assets in any bankmoney regime based on fractional reserves.

Fractional reserve banking and bank runs

Not surprisingly then, the biggest concern of DC designers is mass migration from bankmoney to DC, that is, a veritable bank run. This remains a problem – not, however, a problem with DC (that is, central-bank money, representing safe sovereign money in most

¹³ Niepelt, 2015.

¹⁴ Broadbent, 2016, p. 5.

¹⁵ Jakob/Kumhof 2018; Huber, 2017a, p.59; 2017b.

currency areas), but the fundamental problem of bankmoney based on fractional reserves. It is irksome when the bank run problem is attributed to the introduction of DC, when in actual fact it is a persistent threat inherent in bankmoney.¹⁶

The continued creation of bankmoney will remain a major source of instability. In substantial volumes, DC can mitigate the dynamics of monetary overshoot and proneness to crisis inherent in the bankmoney regime, but DC cannot prevent those dynamics, particularly because, in the current proposals, it is not the central bank but the banks themselves who in the first instance decide whether and how much money to create.

The long existing problem of bank runs in the bankmoney regime is normally much played down, whereas when discussing DC it is unduly exaggerated. Bank runs do not occur in a situation of business-as-usual; they arise when banks get into trouble. Sovereign money and bankmoney have coexisted for over three hundred years, at first in the form of precious metal coins coexisting with private banknotes, and subsequently in the form of central-bank cash (notes and coins) coexisting with bankmoney (deposit money). What would overall be different if this problem-ridden coexistence were to continue with DC used side by side with bankmoney?

Crises of various kinds will recur. The demand for cash and safe DC then will increase accordingly, and the banking sector will not be able, in the short run and in standard ways, to procure enough eligible securities to take up enough money to fulfil its largely empty promise to convert bankmoney into cash or DC. Such a situation would indeed be destabilising. Central banks would have little choice but to resort again to Quantitative Easing (QE). However, if DC devices and currency accounts were available, central banks could do QE in a more effective and sensible way than has hitherto been the case. (More on this below.)

The parity question and state guarantees of bankmoney

In a side-by-side constellation of DC and bankmoney, would the present 1:1 parity between bankmoney and central-bank money endure? Or might a new type of Gresham situation arise, with bankmoney in the role of the less valued means of payment while DC, that is, central-bank or sovereign money, would be valued higher?

The question of parity is intriguing, examined of late particularly by Bjerg.¹⁷ Parity is more closely ensured if the following conditions apply:

- Bankmoney, which is in fact a private means of payment, is allowed to be denominated in the official national unit of account.
- The central bank treats both monies at par, thereby in actual fact administering their parity.
- All state bodies accept and use bankmoney at par.
- The state gives extensive guarantees for bankmoney, for example,
 - in that the central bank almost unconditionally acts as the banks' lender of last resort; within the frame of QE even as the banks' securities dealer of last resort
 - by the government recapitalising banks if need be, and

¹⁶ As an example, see the IMF study on DC in which, however, it is conceded at the same time that DC "could even help the central bank ease liquidity pressures and thus contain bank runs" (IMF, 2018, p. 24).

¹⁷ The problem of parity between monies from different originators, and especially parity between bankmoney and sovereign money, is discussed in great detail in Bjerg, 2017 and 2018, 6ff, 9ff, p. 18.

- by warranting bankmoney in each account up to 100–200 thousand euros.¹⁸

The answer to the parity question largely hinges on the degree to which central banks and governments will maintain those auxiliary constructions to stabilise the inherently unstable bankmoney regime. Equally, this will also decide on the extent to which firms and people will want to use DC in addition to or instead of bankmoney.

At a crossroads

One might assume that as soon as DC is available there will be strong migration from bankmoney to DC. However, DC may not in fact be a fast-selling proposition, and its advantages may not materialise automatically. For example, one would not expect firms and people to feel urged to switch accounts:

- under conditions of business-as-usual when there is no sense of heightened uncertainty,
- if central banks and governments maintain far-reaching state guarantees for bankmoney, and
- if banks pay some deposit interest on bankmoney, while none or less is paid on DC.

Under such conditions, it remains unclear whether a significant shift from bankmoney to DC would occur at all.

As long as there is a dominant bankmoney regime on a small base of cash and a much smaller base of excess reserves, the advantages of DC will fail to materialise. Conversely, however, if there were a critical and growing mass of DC, a greater positive impact on the stability of money, banking and finance would become apparent, thus opening up the prospect of a future sovereign currency system.

Design principles that make the difference

What then are the conditions and design principles that can be expected to support a gradual switchover from bankmoney to DC, so that central-bank money would over time again be the dominant and system-defining means of payment?

No restrictions on access to and relative quantities of DC

The first principle is to secure countrywide access to DC devices and currency accounts according to customer demand. In most proposals put forward thus far, DC is rightly intended to be a *universal* means of payment. What does the universality aspect of DC come down to, if not to the wider principle not to restrict access to and the use of DC?

In contrast, however, current approaches restrict the use of DC. In one model variant, access to DC is reserved for financial institutions.¹⁹ In an earlier concept paper, the quantity of DC

¹⁸ The pivotal role of state guarantees for bankmoney as a decisive system element is particularly emphasised in Wortmann, 2016; (2017a+b). Equally emphasised is cancellation of those guarantees as a precondition for establishing a sovereign money system.

was restricted to 30% of GDP.²⁰ In the Swedish concept, the use of e-kronas is not expressly limited, but only DC devices would be available at the beginning of the process (mobile apps, DC cards), and these are subject to the legal ceilings on cash payments in Sweden, currently at a maximum equivalent to about 250 euros (285 dollars) for each transaction.²¹ This means restricting the use of DC to small retail transactions. It is even considered to waive the obligation to accept e-krona if the latter is granted the status of legal tender.²²

The status of legal tender is self-evident if DC is introduced as a successor to central-bank cash. Why would it make sense to restrict the use of digital legal tender? *Qui bono?* Such limits and restrictions clearly contradict the claim of DC to be a universal means of payment. Should the non-financial public even be excluded from using DC, the whole project would in fact be pointless.

Merging DC and interbank reserves into one circuit

The next design principle is the merging of DC and interbank reserves into a single circuit. Thus far, the English and Swedish proposals have kept reserves and DC apart from one another. This is another arbitrary and implausible design feature. The terms “reserves” and “digital currency” do express different but overlapping functions and owners, and both refer to the same kind of central-bank money-on-account. There is no difference regarding the digital nature and the monetary quality of the central-bank money involved.

A desirable design principle is therefore to treat excess reserves like DC in general. This means

- merging the banks’ excess reserves and their DC, and
- maintaining free exchange between the banks’ and nonbanks’ DC, thereby creating a single DC circuit, involving banks as much as nonbanks.

This does not imply a blurring of the difference between a pure DC transaction account and a bank’s central-bank refinancing account, nor does it impair monetary policy.²³

Full convertibility between bankmoney and DC

A subsequent principle is full convertibility between bankmoney and DC. Bankmoney must be freely convertible into DC, and vice versa. This poses no problem in a technical sense, as can be seen in the example of bank-mediated payments between the central-bank transaction accounts of state bodies and bank giro accounts of nonbanks.

Convertibility of bankmoney into traditional cash was, and essentially still is, a prerequisite for the acceptance of bankmoney and its parity with central-bank money.²⁴ This will also apply to the conversion of bankmoney into DC, particularly as both monies offer the ease of cashless payment.

¹⁹ Kumhof/Noone, 2018, pp.18, where three model variants are discussed: (1) access for financial institutions (FI) only, (2) economy-wide access for everyone, and (3) FIs only combined with narrow banking based on DC.

²⁰ Kumhof/Noone, 2018, pp.18; Barrdear/Kumhof, 2016, 3, p. 50.

²¹ Sveriges Riksbank, 2017, p. 21.

²² Sveriges Riksbank, 2018, p. 22.

²³ The IMF study on DC, too, concludes that “CBDC is unlikely to affect monetary policy transmission” (IMF, 2018, pp. 4, 25).

²⁴ Ingves, 2018, 2 [9].

Central bank guarantee of converting bankmoney into DC, particularly in a bank run

Convertibility of bankmoney must all the more be ensured in a bank run situation. In actual fact, warranted convertibility of bankmoney is the definite answer to the bank run problem. This is to say that in a bank run situation, central banks should stabilise banking and finance *not* by trying to stop the bank run, but by supporting the conversion of bankmoney into DC.

To this end, central banks would have to implement QE by granting special credit to banks specifically for the conversion of bankmoney into DC. In a state of financial emergency this might involve a degree of unsecured book credit entailing a heightened risk for the central banks. However, the measure itself would effectively prevent banks from going bust and would actually help forestall a bank run situation altogether. The promise by a central bank to provide the funds necessary for the conversion of bankmoney if need be would be even more convincing than the comparable government promises that effectively helped avoid larger bank runs in euro countries during the peak of the debt crisis in 2010–12.

Another generally stabilising element in this regard might be support for the emergence of payment service providers exclusively specialising in the management of DC transactions and other payment services, while not being active in other types of banking activities such as lending and investing.

Gradually reducing and ultimately removing state warranties for bankmoney

The question arises as to whether retain or withdraw state warranties for bankmoney. As long as these government guarantees are maintained, combined with basically unrestricted proactive bankmoney creation, one cannot seriously expect the introduction of DC to eventually lead to a situation in which central-bank money would again be dominant and system-defining. Therefrom, another design principle is to reduce and finally remove the state guarantees of bankmoney. The bigger the share of DC has become, the more the state guarantees of bankmoney can be withdrawn. DC, by contrast, does not need to be guaranteed because *it is* central-bank base money or legal tender, a fully valid value-token by itself.

Gradual increase in the use of currency accounts by public bodies

Some of the payment transactions of public bodies are carried out today via transaction accounts with the central bank, and others via bank accounts. It is among the absurdities of the present bankmoney regime that state bodies demand to be paid in private bankmoney rather than in the sovereign currency of the state's central bank.

Public bodies should therefore be obliged to conduct transactions via currency accounts. However, the state's acceptance of bankmoney is a key pillar in the state's warranty of bankmoney. Should this pillar be removed too fast, with public expenditure at 35–55% of GDP depending on the country, bankmoney would be undermined in a way similar to a bank run. Nevertheless, public bodies can begin to use currency accounts in addition to bank giro accounts, steadily increasing their use of DC.

Central-bank credit to banks not the only channel for issuance of DC

The Swedish and English concepts of DC continue the practice of issuing central-bank money by way of disbursing credit to banks in reserves or cash against collateral. The Swedish model involves converting bankmoney into e-krona. This presupposes the banks to have created bankmoney as well as the central bank to sell or lend e-kronas to the banks. The English model issues DC by way of central-bank purchases of sovereign bonds from financial institutions. This presupposes the financial institutions to have acquired the larger part of these bonds with bankmoney rather than reserves. Either way, it is not the central bank but the banks themselves who in the first instance decide whether and how much money is created, while the central bank continues to accommodate the facts the banks have created beforehand.

However, DC also can and ought to be issued in a direct way. This would include measures such as helicopter money. In the eurosystem this might include revising Art. 123 (1) and (2) TFEU, also known as Lisbon Treaty. In its present form, this Article is overtly inconsistent in that its first clause prohibits direct monetary financing of government expenditure, while the second clause indirectly permits monetary financing of sovereign bonds by way of massive bond purchases on the open market.

Central bank deposit interest on DC equal to deposit interest on bankmoney

In the concept variants by Barrdear/Kumhof and Kumhof/Noone, DC is interest-bearing. In the Swedish concept, the e-krona does not yield interest. Why would DC be interest-bearing? Interest is paid on credit and debt positions, or say, on promissory items. DC, however, is *not* a promissory position. It is fully valid fiat money in its own right that does not need coverage by another kind of money or collateral. That is, by the way, why prior to the euro the German Bundesbank refused to pay deposit interest on bank reserves. An IMF study of DC has now found that “none of the central banks surveyed are seriously considering interest-bearing DC”.²⁵

Why then do some scholars argue the case for interest-bearing DC? One reason is to create a peg on which to hang negative interest (next paragraph). Another reason is “to clear the market”.²⁶ The idea of market equilibrium, however, is empirically hard to substantiate. By contrast, it is quite obvious what deposit interest *on DC* actually can do: it complements the deposit interest *on bankmoney* that banks are likely to pay.

In a pronounced shift from bankmoney to DC, banks would certainly not fail to offer high-enough deposit interest (as was formerly paid on private banknotes) to prevent deposits from draining away. In the same way, central-bank deposit interest on DC could be set higher or lower than the banks’ deposit interest on bankmoney. This would allow influencing customers’ preferences for bankmoney or DC.

If deposit interest were paid on bankmoney, but none on DC, this would significantly contribute to an undesirable effect of pro-cyclical fluctuation: conversion of bankmoney into safe DC in times of heightened uncertainty, and back to interest-bearing bankmoney in times of business-as-usual. In this regard, paying deposit interest on DC can be a neutralising

²⁵ IMF, 2018, p. 29.

²⁶ Kumhof/Noone, 2018, p.8.

measure if the interest rate paid on DC is *equal* to the interest rate on bankmoney. This will create a level playing field and counteract the undesirable pro-cyclical shifting.

Ruling out “negative interest”

For some experts, DC is a vehicle for abolishing cash so as to pave the way for imposing negative interest.²⁷ The reasons for this are as follows. Since the 1970–80s, the growth of money, credit and debt has ongoingly been overshooting the nominal growth of GDP. This resulted in a huge overhang of financial assets and debt, harmlessly called “savings glut”, in other words, over-abundant supplies of capital, producing asset inflation and a pronounced demand market that depresses interest rates. The Fed Funds rate, for example, went from a 16% peak in 1980 down to 0% in 2009–16.²⁸ Interest rates cannot naturally slip below that 0% “lower bound”, and close to it there is no more room for conventional policy maneuver, in this case, lowering base rates in a downswing or even crisis. To some, 0% interest thus means “monetary paralysis”.²⁹ The ready suggestion is breaking through the lower bound by imposing negative interest.³⁰ That is, rather than receiving deposit interest, having to pay interest; more generally speaking, making a creditor pay interest to the debtor, rather than the debtor paying interest to the creditor.

Some supporters of negative interest expressly refer to Gesell’s 1916 concept of demurrage on holding cash and the “Wörgl miracle” of 1932.³¹ Gesell thought in terms of a cash economy. He almost equated holding cash with hoarding it. The question inspired Keynes’s notions of liquidity preference and the liquidity trap. To discourage “hoarding” money and stimulate spending for money to “make the world go round”, Gesell considered a demurrage rate of 6% p.a. to be appropriate.

In Wörgl, a small town in Tyrol, the mayor resorted to issuing municipal emergency notes in 1932, after local unemployment had reached 30% due to factory shutdowns during the Great Depression. The notes were subject to demurrage, that is, an artificial loss of purchasing power, of 1% at the end of each month. The money was put into circulation in payment of public works. After initial difficulties, particularly hesitant acceptance by local businesses, the initiative was crowned by success. The local economy recovered to a degree, which was perceived as a little economic miracle.³² After just one year, however, the Wörgl notes were suppressed at the instigation of the Austrian National Bank.

To believers, the Wörgl experience is the irrefutable proof of concept. In reality, it is likely to have been a miracle that wasn’t. The decisive point was that people had skills and resources, means of production and infrastructure, but no money. They were given money, and that was what did the trick. Without the 1% demurrage, the economy would have recovered just the same, as no one in town was sitting in a “liquidity trap”. The message is straightforward: rather than fiddling with interest rates and taking away people’s purchasing power, simply add to their purchasing power, the more so in the midst of a crisis.

²⁷ Among those who see DC as a suitable vehicle for imposing negative interest are, for example, Bordo/Levin, 2017, p. 3; Bordo, 2018, p. 3. The IMF study on DC also states that DC “would eliminate the effective lower bound on interest rate policy”, even if the central banks surveyed in the study declared negative interest not to be a reason for introducing DC (IMF, 2018, pp. 4, 29).

²⁸ fred.stlouisfed.org/series/FEDFUNDS

²⁹ Rogoff, 2017.

³⁰ Buitter/Panigirtzoglou, 2003; Buitter, 2009; Rogoff, 2017.

³¹ Buitter, 2001, p.32; Buitter/Panigirtzoglou, 2003.

³² Broer, 2007.

Negative interest is counter-productive, because reducing mass purchasing power will reduce rather than stimulate economic activity. This applies all the more as fluctuations in the actors' liquidity preference are relevant to capital expenditure and high-end consumption, while most elements in the composition of mass consumption do not admit much delay. Adding to this, most people do not react as expected. Negative interest, rather than spurring faster or additional expenditure, is more often likely to trigger compensatory spending cuts. If money is confiscated from people, they do not hurry to spend what is left, but try to make up for what has been taken away (except under conditions of runaway inflation).

Moreover, the Gesellian demurrage approach was born from the under-consumption theory of the business cycle (lack of effective demand). This certainly had a point during the Great Depression. In the context of the 2008 banking and debt crisis, some over-indebted nation-states as well as people from the lower social strata in all the involved nations again had to suffer austerity, even though at a level much less miserable than was formerly the case. Instead of imposing austerity, which once more has proven to be counter-productive, debtors *and* creditors would have fared much better by adding mass purchasing power, for example, by way of monetary financing of so-called helicopter money or a citizens' dividend, that is, *QE for the real economy* rather than pouring hundreds of billions into *QE just for finance* – which has retained rather than resolved the underlying problems of “too much finance”, that is, too much capital and debt, postponing them into the future.

In general, however, there is no situation of under-consumption today. Attempts to stimulate growth have acquired an ambivalent character, particularly in view of widespread over-consumption in ecological terms, owing to an ecologically still ill-adapted technological basis of industrial production and products. It therefore seems very strange that many green-minded people are to be found among the most fervent supporters of negative interest with the aim of stimulating growth.

What does negative interest really come down to? Is it artificial “inflation”, a “fee”, a “tax”, or indeed “interest”? None of these apply. Inflation is an increase in the price level and thus far a general loss of purchasing power. From a money owner's point of view, paying negative interest on account balances may seem to be the same. Inflation, however, affects all actor groups and does not one-sidedly burden bank customers, while augmenting bank profits. That needs to be understood: *Negative interest on bankmoney* reduces the liabilities of banks to their customers and results in higher balances of a bank's profit account. This is tantamount to an illegal private tax on deposit money to the benefit of the banks. At the same time, the stock of available money is dysfunctionally reduced.

The same would apply if banks had to pass on their receipts of negative interest *on bankmoney* to the treasury or the central bank. Such mingling of monetary and fiscal policy is questionable. Taxing is not a central bank's business. Independently, negative interest as a money tax is questionable by itself, for it represents a kind of additional, downstream tax on everyone's available income after income tax, social security and public transfer payments. People would certainly try to evade the loss by “sweeping” liquid balances as much as possible into short-term savings and time deposits or MMF.

As regards interpreting negative interest as a surcharge on top of the fees for account management and payments, negative interest in fact adds to a bank's profit account in much the same way as the fees payable by the customers. However, there is no additional service

at all, rather a disservice. Furthermore, fees are charged for a specified service, not as a fixed-percentage deduction from an account balance.

Finally, it has often been said, negative “interest” is an unnatural, confused concept. It refers to something which does not in fact exist. For example, “real interest” is commonly defined as the actual interest rate minus the inflation rate. The result may be positive or negative. Combining two different classes of operands in this way makes sense when considering the actual-versus-nominal purchasing power of various kinds of income (earnings, interest, transfers). But it does not make the inflation rate an interest rate. An interest rate may be zero but is never negative. In a non-manipulative market environment, interest rates are always positive.

Similarly, an individual can have a greater or lesser income or no income at all, but not a negative income; rather, a positive-figure amount of debt. Breaking through the “lower bound” is possible in the world of numbers, but not in the real world. You pay interest to someone who has lent you money, but you do not agree to pay interest to someone who has borrowed from you. Similarly, it would be nice to go shopping and to have the shopkeeper pay you the purchase. Apparently, this would be turning the real world upside down.

Negative interest is a technocratic folly born from unworldly model economics, a measure that inappropriately expands and hence distorts conventional interest rate policy in a desperate attempt to regain the latter’s effectiveness which has largely been lost in the present bankmoney regime. As an instrument of monetary and economic policy, negative interest is counter-productive and unjust, even likely to be unlawful when benefitting the banks, and should thus generally be ruled out, also and particularly in connection with the introduction of DC.

Concluding remarks

When reading central bank statements on DC, one is left with an ambivalent impression, as if central bankers were running ahead of their convictions, seriously considering DC and yet being afraid of it. Sure, the envisaged coexistence of bankmoney and DC raises the questions discussed above, and in some respects watertight answers cannot yet be given. However, it is not necessary to know all answers and details in advance. As already mentioned, the modern world has been living for over 300 years with the conflicting situation that arises from the coexistence of sovereign currency (coins, notes and reserves) and bankmoney. The equally conflicting situation formed by the coexistence of DC and bankmoney will not be too different from this.

The questions discussed above, by the way, would not arise if central banks and politics had the courage to make a full transition from bankmoney to DC. The problems dealt with in this paper are in fact tied to the preferred step-by-step approach to introducing DC. Nevertheless, any step of introducing DC, in whatever variant, is a step forward, and to a certain extent offers the advantages mentioned above. By comparison, the problems inherent in the present near-complete rule of bankmoney are still much larger than those relating to DC might be.

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