

Digital Base Money: a few considerations from a central bank's perspective

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There are many ways to design Digital Base Money (DBM) for non-banks. The different options have potential impacts – both positive and negative – that need to be studied and considered carefully. Only when the best way of designing DBM has been identified, can a decision be made as to whether DBM of non-banks should be introduced at all.

The most important question for the European Central Bank is whether introducing a DBM would affect our ability to honor our mandate to maintain price stability.

The internet and portable online devices have radically transformed the way we use and exchange information, and the way we exchange money. Money has been digitalized in many ways and clients can nowadays transfer bank deposits electronically and pay with e-money. There is one type of digital money which is of particular interest to a central bank: Central Bank Digital Currency or Digital Base Money (DBM), as I have called it⁽¹⁾. DBM is money characterized by two features: a) like banknotes in circulation, DBM is a claim on the central bank; b) in contrast to banknotes, it is digital.

Obviously, DBM does already exist. Commercial banks and other institutions hold digital claims on central banks in the form of deposits. But there has been more recent discussion about whether central banks should provide DBM to a wider range of counterparties, allowing non-banks, including private households, to hold accounts at the central bank⁽²⁾. To name but a few, the People's Bank of China, the Bank of England and Sveriges Riksbank have published on this topic or have indicated that they are conducting some work on it.

There are two main reasons why this discussion on DBM has been started:

- Electronic payments have become increasingly popular. There are already a number of electronic payment methods provided by the financial industry, such as credit, debit and pre-paid cards. But these methods are based on commercial bank money and people may prefer to hold claims on the central bank to avoid the risk that the commercial bank defaults. From this perspective, an increasing demand for DBM could emerge;
- Some technological developments may now render the introduction of DBM much easier and potentially less

expensive than ten years ago. This includes Distributed Ledger Technology, or DLT, a variant of which is used, for instance for Bitcoin. But considerable uncertainties continue to question the robustness of these solutions.

These are good reasons to start a discussion on DBM and for research to understand better the options available for DBM and their implications for central banks in fulfilling their mandates. In some European countries, like in Sweden and Denmark, electronic payments have started crowding out the use of cash. This may give the discussion an additional drive which has been taking place in academic circles for a while⁽³⁾.

(1) *Digital Base Money: an assessment from the ECB's perspective*, Speech by Yves Mersch, Member of the Executive Board of the ECB, at Suomen Pankki – Finlands Bank, Helsinki, 16th January 2017.

(2) *It is noteworthy that pursuant to Article 17 of the ESCB Statute Eurosystem central banks may open accounts for credit institutions, public entities and other market participants. It would also need to be assessed whether the possible widening of the range of counterparties which may hold, in a digital form, claims towards a central bank is justified and proportionate.*

(3) *For an overview see: Buiter, W. (2009), Negative Nominal Interest Rates: Three Ways to Overcome the Zero Lower Bound. NBER Working Paper 15118; Summers, L. (2013), Economic Forum: Policy Response to Crises. IMF Fourteenth Annual Research Conference in Honor of Stanley Fisher, 7th and 8th November 2013. Washington, D.C., <http://www.imf.org/external/np/res/seminars/2013/arc/index.htm>; Rogoff, K. (2014), *Costs and Benefits of Phasing out Paper Currency. NBER Working Paper, 20126*; Rogoff, K. (2014b), *Paper money is unfit for a world of high crime and low inflation Financial Times, 28th Mai 2014*; Leaviss, J. (2015), *How to End Boom and Bust: Make Cash Illegal. The Telegraph, 13th Mai 2015*; Mersch, Y. (2016), *Bares bleibt Wahres, Spiegel-Online, 5th Mai 2016, <http://www.spiegel.de/wirtschaft/service/500-euro-schein-bares-bleibt-wahres-kommentar-a-1090897.html>**

In the euro area, however, we do not see a trend away from cash. By contrast, in recent years the growth in demand for banknotes in the euro area has by far exceeded that of nominal economic output. In the last five years the average annual growth rate of euro banknotes in circulation was 4.9 percent (value) and 6.2 percent (pieces) respectively. This rise includes those denominations which are predominantly used for transactions rather than for savings.

For the ECB, the discussion for the time being is an analytical one. The ECB would in particular have to understand the impact – positive or negative – of DBM on its primary objective of price stability before considering introducing it. Moreover, any value judgement on DBM needs to be assessed against a number of high-level principles, namely (1) technological safety, (2) efficiency, (3) technological neutrality, and (4) freedom of choice for users of means of payments.

I would like to present some of the various options for designing, issuing and managing DBM, and discuss some of their potential consequences. This will not be an exhaustive list, but it can give first insights into the complexity of the issue at hand.

Account-based versus value-based Digital Base Money

Starting with a primarily legal dimension, one can distinguish between account-based and value-based DBM. Current DBM in the form of commercial bank deposits at the central bank is account-based. A transfer of DBM from one bank to another bank is final when the funds are debited from the account of the payer and credited to the account of the payee. The central bank is directly involved, as it registers the transfer.

Cash is different: it is value-based, accounts are not involved. A transfer of cash is final when the payer hands the cash over to the payee. The central bank does not register transfers of cash, only the initial issuance and the final return.

DBM held by non-banks could either be account-based – in this case, the central bank would open an account for every interested non-bank – or it would be value-based like cash. In this case, interested non-banks would need to be equipped with electronic wallets for holding and using DBM. A transfer of DBM would require that the funds be debited from the payer's electronic wallet and credited to the payee's device without the involvement of the central bank.

Whether DBM is account-based or value-based might matter for several reasons. First, value-based and account-based DBM may require very different types of technology with specific safety features and costs. DLT may be fit for both, but in different ways.

Second, anonymity towards the central bank can be achieved only with value-based DBM. These factors may influence the demand for DBM by non-banks and whether DBM would be used more to substitute cash or bank deposits.

Options for providing DBM

With that distinction in mind, one can discuss the way DBM could be provided to non-banks.

A straightforward approach would be to allow non-banks to convert commercial bank deposits into DBM at a rate of 1 to 1. As cash can always be paid into a bank account, this would also allow non-banks to convert cash into DBM.

It may be argued that with such an approach bank runs could unfold more easily and faster. Indeed, non-banks could react to bad news about a certain bank by quickly switching their deposits into default-free DBM. There would be no need to keep the cash under the mattress. This would counteract important regulatory efforts to reduce excess volatility in the movement of funds between types of investment.

The situation would be different in a systemic banking crisis, though. If depositors perceived the entire commercial banking sector as fragile, a sector-wide run might be made more likely and severe by DBM, negatively impacting the efficiency of financial markets.

Depending on how attractive DBM is for non-banks, a more gradual substitution of commercial bank deposits by DBM is, of course, possible too. This could have different effects on commercial banks. For example, commercial banks with excess central bank reserves could reduce their excess reserves when they experience a DBM-induced deposit outflow. This could increase their profitability in the current situation, as deposits bear a higher interest rate than excess reserves.

But banks without excess central bank reserves might need to replace deposits by central bank credit. They would need to provide more collateral to the central bank. And the interest rate to be paid on central bank credit may, at least in normal times, be higher than the average rate on customer deposits. The profitability of these banks might suffer. A potential consequence could be higher interest rates on bank loans. These effects may require an adjustment of central bank policy rates and could make monetary policy more difficult until a new steady state is reached.

Given these challenges, the more straightforward approach which would allow non-banks to convert bank deposits directly into DBM at a rate of 1 to 1 may therefore appear more attractive, provided that non-banks mainly substitute cash rather than bank deposits with DBM. As long as DBM mainly replaces cash, negative side effects of DBM might be unlikely. In this context, consideration could be given to making DBM as cash-like as possible, at least initially, until more experience is gained.

Remuneration of DBM

How should the central bank remunerate DBM held by non-banks?

For the euro area, one option could be to remunerate DBM at the same rate as excess central bank reserves held by commercial banks, i.e. at the rate on the deposit facility.

This would mean applying a policy rate directly to funds held by non-banks. This could potentially strengthen the transmission of monetary policy rate decisions to the economy.

The deposit facility rate is currently -0.4%. At this interest rate, demand for DBM may be low. But in normal times, when it is positive, remunerating DBM at the deposit facility rate may be risky. It could make it too attractive to convert commercial bank deposits into DBM. As argued before, this could have negative side effects.

An alternative option would then be to remunerate DBM at a rate of 0%. This is the rate at which cash (i.e. banknotes and coins) is de facto "remunerated". With a rate of 0%, non-banks are unlikely to convert commercial bank deposits or cash into DBM if their motive is only to obtain a better remuneration. Even in times of negative central bank rates, retail bank customers only rarely receive a negative remuneration on commercial bank deposits.

Even so, a 0% interest rate on DBM held by non-banks is not without policy risks. If banks have large amounts of excess central bank reserves remunerated at a negative rate, they could try to find ways of replacing their excess reserves by DBM, such as by setting up a non-bank subsidiary. This may counteract monetary policy.

If the central bank considered this risk important, it could combine the two approaches mentioned so far. It could remunerate DBM held by non-banks at a rate of 0%, if the deposit facility rate is positive. And if it is negative, it could remunerate at the deposit facility rate. This may, however, entail strong movements out of DBM when the deposit facility rate turns negative.

Moreover, there is a risk that a negative remuneration of claims of non-banks on the central bank would substantially undermine the confidence in the central bank.

Technology for DBM

Finally, there is the technological dimension of DBM. As mentioned earlier, one reason why the discussion on DBM for non-banks has started is that we now have technologies that could make it easier to issue DBM. This includes, in particular, Distributed Ledger Technology (DLT). DLT carries great potential, but is it already advanced enough

to be applied by central banks? Reputation is crucial for central banks. Central banks cannot afford mistakes in the technologies employed. Before the central bank can start providing DBM to non-banks, they need to be sure not only that DBM is unlikely to have negative economic side-effects, but also that the relevant systems are operationally efficient and safe.

But that does not mean that central bankers should be dogmatic. If a more efficient, but absolutely safe, technology for central banking operations can be found, introducing it could reduce costs for both the central bank and users, and therefore for society as a whole.

Conclusions

There are many ways to design DBM for non-banks. The different options have potential impacts – both positive and negative – that need to be studied and considered carefully. Only when the best way of designing DBM has been identified, can a decision be made as to whether DBM of non-banks should be introduced at all.

The most important question for the ECB is whether introducing a DBM would affect our ability to honor our mandate to maintain price stability.

More generally, any materialization of DBM would have to be assessed against four principles: (1) technological safety, (2) efficiency, (3) technological neutrality, and (4) freedom of choice for users of means of payments.

As there has been some speculation about a possible intention of central banks to abolish cash, one aspect relating to the principle of freedom of choice needs to be stressed: if DBM for non-banks were introduced, it would exist alongside cash for the foreseeable future. It would merely be an additional option for non-banks to hold funds. In particular, those who are skeptical about digital devices would naturally continue to use cash.

Even where efficiency gains are possible when people substitute some of the cash for DBM, this would still require that the technology used for DBM be operationally reliable and secure against attacks. Technological feasibility and cost considerations alone will not change our mandate.