

# The Central Bank with an expanded role in a purely electronic monetary system

Trond Andresen [The Norwegian University of Science and Technology, Norway]

Copyright: Trond Andresen, 2014

You may post comments on this paper at

<http://rwer.wordpress.com/comments-on-rwer-issue-no-68/>

## Abstract

Physical currency (bills and coins) is being phased out as an important means of exchange both in developed and developing countries. Transactions are increasingly done by debit card, computer, and mobile phone. This technologically driven process opens up some very useful possibilities, among these new and – for society – beneficial roles for the Central Bank. The paper assumes a scenario where the country in question issues its own currency, and all money is “electronic” – no bills and coins. This gives an extra impetus to the *sovereign money* solution; all deposits are at the Central Bank.

The paper also argues that in such a system – where banks are not allowed to create “credit money” when issuing loans (in this resembling the “100% reserve” solution supported by many reformers) – the economy need not, in spite of this, be “starved” of credit for investment – a warning that is not only sounded by the defenders of today’s financial system, but also by many of its critics. This goal might be achieved by the unconventional trick of letting *commercial banks create the needed sovereign money at the Central Bank* for their lending.

A third point of the paper is to argue that simplification of the financial system should be a goal in itself.

**JEL codes** B50, E5, E40, E42, E44, E58, G20, G28, H12, H62

## 1. Introduction

The technological development process that allows electronic transaction instead of exchanges using physical currency, has the same merciless and irreversible character as the advent of the electronic calculator in the 70s and digital photography in the 90s: it meant the unavoidable death of the slide rule (then) and photographic film (more recently). Based on the nature of technological innovations and the market economy’s exploitation of such, we may predict the death of physical currency; bills and coins. It is probably a question of when, not if, this will take place. This paper will discuss some positive possibilities for reform of the financial and monetary system that emerge as a side effect of the unstoppable advances of technology in this field.

A modern financial system consists of a Central Bank (CB) and an extensive network of private financial units. The role of a CB has up to this day been as an interest-rate setter behind the scenes and – in crisis – “lender of last resort” for the network of private licensed (“commercial”) banks and non-bank financial institutions (NBFIs).

The commercial bank network has historically been quite dense, with branches of competing banks within a reasonable distance from customers. The reasons for this geographical diversity has been twofold:

1. Handling deposit accounts and receiving or furnishing customers with physical currency.
2. Vetting potential borrowers and extending loans.

With the advent of electronic transactions (PC, debit card and, lately, mobile phone) the need for a dense network of branches has decreased, and commercial banks have started the process of closing down an increasing share of these. If we envisage an expected future without physical currency, the first point above will disappear as a reason for having bank branches. What remains is the second point, the need for offices to handle decisions about loan applications, which to a fair degree will be best handled by personnel having local and/or specialised knowledge. Except for this, most decisions can be taken at a bank's central office.

So, simply because of no more need for branches to acquire or deposit physical money – for purely technological reasons, not society's economic policy considerations – it becomes feasible for all "agents" (persons, firms, banks) to only have their checking accounts directly at the CB. Then one may dispense with bank credit money and let all money in circulation be *base money (high-powered money; HPM)*. For the public this means that their deposits are completely safe, and in that sense it matches the 1930ies "Chicago plan" and its "100% money" proposal. But it goes further, because in the 100% money plan, banks would hold people's deposits (although fully covered by the banks' deposits at the CB) and furnish them with physical currency, while in the above electronic money scenario liquid deposits only exist directly at the CB. This is the *sovereign money* alternative (Huber 2014). Technological possibilities today give a new impetus to this alternative, which has until now been promoted based on political economy arguments only.

We will from now on describe and argue for a banking scenario based on the sovereign money alternative, but with only electronic currency, using the acronym "ESMA – Electronic Sovereign Money Alternative".

We will first address an argument raised against both 100% money and sovereign money: "*when banks are not allowed to create credit money, the economy will suffer because of lack of credit*".

## **2. The heterodoxy is partly hostile to 100% money or sovereign money**

The famous pre-WWII Fisher et al *Chicago Plan*, was more recently re-examined (Benes & Kumhof , 2012), and in conclusion supported, where they write in the abstract:

At the height of the Great Depression a number of leading U.S. economists advanced a proposal for monetary reform that became known as the Chicago Plan. It envisaged the separation of the monetary and credit functions of the banking system, by requiring 100% reserve backing for deposits. Irving Fisher (1936) claimed the following advantages for this plan: (1) Much better control of a major source of business cycle fluctuations, sudden increases and contractions of bank credit and of the supply of bank-created money. (2) Complete elimination of bank runs. (3) Dramatic reduction of the (net) public debt. (4) Dramatic reduction of private debt, as money creation no longer requires simultaneous debt creation. We study these claims by embedding a comprehensive and carefully calibrated model of the banking system in a DSGE model of the U.S. economy. We find support for all four of Fisher's claims. Furthermore, output gains approach 10 percent, and steady state inflation can drop to zero without posing problems for the conduct of monetary policy.

Ann Pettifor disagrees (Pettifor, 2013), and argues (page 20) that 100% reserve banking will lead to lack of credit:

The Kumhof and Benes proposal is indeed based on the monetarist ideas of the Chicago School, one that seeks to limit the quantity of money, and that would restore the role of banks to intermediaries between savers and borrowers. Only now the proposal is to eclipse the role of the private sector altogether, and only allow lending backed by a 100% reserve requirement. In other words, all banks or lenders would first have to mobilise 100% of the funds needed for lending. This would massively constrain the availability of credit. (...)

Limiting the quantity of credit is certainly one way of limiting employment. Thus monetarist theory and policies both tolerated and sustained a massive rise in unemployment in the 1930s and 1980s. The Kumhof and Benes proposal is no more than a revival of these policies: the 'barbaric relic' that was the gold standard.

Pettifor is hostile to the 100% reserve concept – and her platform is anti-neoliberal<sup>1</sup>. She is not alone in this; many central authors in the heterodox Modern Monetary Theory (MMT) and/or Post Keynesian camps share her position. One of these is Jan Kregel, who describes and supports Hyman Minsky's critique of what he termed "narrow banking" (this corresponds to banks subjected to a 100% reserve requirement) in a paper that argues along similar lines (Kregel, 2012):

In the absence of a large government sector to support incomes, liabilities used to finance investment could not be validated in a narrow bank holding company structure. But, even more important, it would be impossible in such a system for banks to act as the handmaidens to innovation and creative destruction by providing entrepreneurs the purchasing power necessary for them to appropriate the assets required for their innovative investments.

Emphasising the need for easy access to credit for "Schumpeterian creative destruction", Kregel argues that if banks are not allowed to create extra money when lending, what is left:

... is not a bank, but simply a safe house or piggy bank for government issues of coin and currency.

Kregel, however, points to a possible solution to – or amelioration of – lack of capital for investment:

In the absence of private sector "liquidity" creation, the central bank would have to provide financing for private sector investment trust liabilities, or a government development bank could finance innovation through the issue of debt monetized by the central bank. (...) such a system would have to combine Keynes's idea of the "socialisation of investment" with the "socialisation" of the transactions-and-payments system. (...)

---

<sup>1</sup> I share this general anti-neoliberal position. And I will not defend DSGE – the main tool for neoclassical modeling – used in the Kumhof and Benes proposal, and all other details there. But I agree with them about the benefits of (some sort of) a "100% reserve" system.

the real problem that must be solved lies in the way that regulation governs the provision of liquidity in the financial system.

This paper proposes regulation that may achieve what Kregel suggests, but by the unconventional road of letting commercial (licensed, “narrow”) banks *decide on creation of HPM at the Central Bank*. This will be explained in the following.

### **3. Ample credit lines for banks at the Central Bank**

Consider an economy where all money is base money (HPM): Could banks not – if they mean they have a worthwhile and fairly safe lending opportunity – just borrow HPM from the Central Bank and re-lend it at a somewhat higher interest rate? This is in contrast to today’s state of affairs where credit money is created directly through bank lending, completely dominating money growth.

Such bank borrowing from the CB implies that HPM will grow as an effect of this, not only through government deficit spending (if we follow the MMT advice of financing government deficits by directly “borrowing” from its CB, instead of selling bonds to banks and the public). So in such a scenario, some money will not only be *spent* into circulation (government deficit), some will also be *lent* into circulation (via banks). *But all of it will be HPM*: The amount of extra money created and subsequently put into circulation due to bank borrowing from the CB will be completely safe, not credit money which carries some risk.

Banks could also gather money for their lending by selling bonds or offer time deposits to the public. Then the amount of extra money created by bank borrowing from the CB would constitute only a share of new loans given. But we will argue that this alternative, which puts the saver at some risk, is not necessary.

To sum up at this stage, our ESMA scenario assumes that all government deficits are financed by “loans” from the CB (“loans” in quotation marks, if we regard the CB a tool of the government – following MMT), and that all bank lending is financed by corresponding loans to banks from the CB. Banks will resemble “franchisees” of the CB, living off the difference on interests in and out. The role left for banks is to be pure intermediaries.

#### **3.1 A quite harmless “bailout”**

With ESMA, if a bank defaults, the bank owners would lose all their equity. Hence, any bank would have a much stronger incentive for responsible behaviour than in today’s environment. And there would be no need or reason for society to step in with bailouts. This will be a credible threat that banks’ owners have to take seriously.

The impact on the CB would be much less dramatic. The only “loss” to the CB and society when a bank defaulted on loans from the CB, would be that the corresponding HPM that was supposed to be destroyed though repayments with interest to the CB, *remained in circulation*. Instead of society increasing taxes to pay for bailing out a bank, money that was already in circulation would not be retired. The effect of this would then be spread thinly over society as a whole. At worst this would give a small impulse for inflation. We may contrast this small disadvantage with the big advantage of directly hitting the bank owners in this proposal; they

would lose their assets. And this no-bailout system should – even with interbank lending – be 100% robust in a systemic sense.

Based on the above, licensed banks can be given very ample credit lines to the CB, at reasonably low rates. This is the main reason that society's need for credit should not be constrained in a damaging way.

That said, banks should not be allowed unlimited borrowing from the CB. This is discussed in the next subsection.

### **3.2 A BIS-type capital adequacy constraint is feasible**

In today's regulatory environment, banks are to a decreasing degree reserve constrained in different countries. The trend is towards implementing Bank for International Settlements-type regulation that only sets a lower threshold for commercial banks' capital adequacy. We will discuss this based on a simplified representation of this regulatory framework that is taken from (Andresen, 2010), and in the next stage we suggest a very similar capital adequacy requirement tailored for the ESMA scenario.

We define:

$M(t)$  = deposits = money stock [\$], the bank's liability. We abstract from notes and coins, and from interbank lending which has no important bearing on the points to be made.

$D(t)$  = loans from bank [\$].

$R(t)$  = reserves = a bank's deposit with the CB = high-powered money (HPM) [\$]. We assume that  $R > 0$ . The Bank's total financial assets are now  $D + R$ , where  $D$  = loans as before.

$k_0$  = the required minimum capital/asset ratio [ ]. This entity is dimensionless, thus the [ ].

$k$  = the actual capital/asset ratio [ ].

Variables' dependence on time ( $t$ ) is from now on not shown. Remembering the Basel rule that risk weights shall only apply in the denominator and that reserves  $R$  carry zero risk weight, we get the requirement

$$\frac{D+R-M}{D+0\cdot R} = \frac{D+R-M}{D} = k \geq k_0 \quad (1)$$

What happens when the bank extends a loan  $\Delta D$ ?

Since both  $D$  (the bank's asset side) and  $M$  (liabilities side) increase with  $\Delta D$ , the nominator remains the same, while the denominator increases with  $\Delta D$ . The result is a fall in  $k$  towards  $k_0$ . This may imply a restriction on further lending, and that is the purpose of the regulation: to achieve some minimum robustness against insolvency.

Now to the ESMA scenario. We additionally define:

$D_{CB}(t)$  = the bank's debt to the CB [\$].

We now suggest the requirement:

$$\frac{D+R-D_{CB}}{D+0\cdot R} = k \geq k_0 \quad (2)$$

The liability towards the CB here plays the same role as today's bank liability  $M$  towards its depositors. When the bank extends a loan  $\Delta D$ , the situation for the bank afterwards is:

$$\frac{D+\Delta D+R-(D_{CB}+\Delta D)}{D+\Delta D} = \frac{D+R-D_{CB}}{D+\Delta D} = k \quad (3)$$

The ratio  $k$  is decreased in the same way as today. We thus achieve a regulatory constraint on banks' lending behaviour which formally is quite similar to that given by the current regulations, except for one difference: in today's environment we have a two-way relationship (the bank and the borrower), while the relationship in the ESMA scenario becomes *triangular*: the bank, the CB, and the borrower. The bank gets a claim  $\Delta D$  on its borrowing customer, the CB gets the same extra claim on the bank. The balance sheet of the bank customer increases with  $\Delta D$  on the customer's liability side at the bank, while the customer's checking account at the CB is credited with  $\Delta D$ . But the change from a dual to this triangular relationship does not impact on the efficacy of the suggested ESMA capital adequacy rule.

#### **4. The CB as a lending and savings hub for society**

So far about CB lending to banks. On the *savings* side, the CB can – due to the information technology revolution discussed above – offer individual accounts not only for banks, but for *all* agents: citizens and firms; both a checking account and a spectrum of time deposits yielding different rates, payment profiles and durations. Since individual depositors' money at the CB – whether from persons or businesses – would be completely risk-free, a checking account there should yield zero interest. But such accounts could be cost-free for the user, considered part of a modern welfare state's shared free infrastructure, like healthcare and schools.

By tweaking interest rates on its lending, the CB can ensure that banks get the necessary incentive to lend, by a sufficient difference between bank lending rates and (for them) CB borrowing rates. On the other side, by offering sufficient rates on its spectrum of time deposits, the CB can withdraw money from aggregate demand, from banks, firms and individuals.

##### **4.1 A simplified and understandable system**

For a modern monetary economy to function well, there needs to be democratic discussion among the public of the workings of the financial and monetary system. Such discussion is simply not feasible today due to the enormous complexity of finance. One reason for this

complexity is explained as “innovation” to cater to additional “needs of the market” as the defenders of today’s state of affairs say. Another reason which is much less discussed is that this complexity makes finance impenetrable to the public and lawmakers, so that they are cowed and leave the financial sector alone and give up on reforms. Enter the ESMA, which has the added benefit of making the financial and monetary system much simpler, and thus accessible for public discussion, control and reform.

We have until now discussed the role of commercial (licensed) banks with the ESMA. But in what way – maybe negatively – will such simplification impact some of the large NBFIs that also constitute the modern financial sector? Let us take pension funds as an example. Abstracting from assets overseas, with ESMA they will have a portfolio consisting of – like today – company stocks and property (which should and can be regulated much better to avoid bubbles, but this is not a topic for this paper), *and large assets in the form of time deposits or bonds*<sup>2</sup> at the CB. These assets are again completely safe, which is of course a benefit to the pension savers. If a fund wishes for higher returns and accepts the ensuing higher risks, it can compose a portfolio with a smaller CB savings component. There is no important loss of flexibility for a pension fund with the ESMA.

## 5. Concluding remarks

In the proposed ESMA, the government runs more or less persistent fiscal deficits – the normal state of affairs recommended by MMT – by “borrowing” from the CB. There is no need to issue government bonds to cover the deficit. The CB only offers a spectrum of shorter term securities as an adjustable tool for interest rate control.

The interest rate is essentially controlled by the CB, as it is now. Money supply and debt growth may be better controlled, to follow physical growth harmoniously. Banks cannot net create money by themselves, like they do today<sup>3</sup>. But most important is that their debt creation will be less irresponsible, because of the effective threat of loss to bank owners.

There will be no lack of flexibility and agility in this scenario however, since licenced banks will enjoy ample credit lines to the Central Bank to access the necessary HPM in time, when giving a new loan. They can also borrow from other banks (but allowing interbank lending is not a prerequisite for the ESMA). By this, they can grant a loan just as easily and quickly as they do today. The amount of net HPM created through government deficit spending plus that created through banks’ borrowing from the Central Bank, can be controlled by fiscal and monetary policy to be sufficient, among other things so that there is no harmful lack of credit.

And banks that currently have too much HPM and see too few lending opportunities can save at the Central Bank, using the spectrum of paper offered by the Central Bank for that purpose.

---

<sup>2</sup> One issue which will be left out here, is whether the CB should offer only non-transferable time deposits, or also sell a spectrum of securities, which – as opposed to time deposits – can be traded. The choice here does not impact much on the workings of the ESMA.

<sup>3</sup> The mathematical mechanics of this is discussed in (Andresen, 2010). An essential result there is that the growth rate of debt and credit money is inversely proportional to the minimum required capital adequacy ratio, called  $k_0$  above. This gives fairly steep growth when  $k_0$  is less than 10%, and banks for profitability reasons wish to stay at this limit.

## References

Andresen, T. (2010). Basel rules, endogenous money growth, financial accumulation and debt crisis, *The Aftermath of The Crisis*, Centre of Full Employment and Equity, University of Newcastle, Newcastle, Australia, pp. 8–20.

URL [http://www.itk.ntnu.no/ansatte/Andresen\\_Trond/econ/basel.pdf](http://www.itk.ntnu.no/ansatte/Andresen_Trond/econ/basel.pdf), accessed 28 May 2014.

Benes, J. & Kumhof, M. (2012). The Chicago Plan Revisited, *working paper*.

URL <https://www.imf.org/external/pubs/ft/wp/2012/wp12202.pdf>, accessed 28 May 2014.

Huber, J. (2014). Modern money theory and new currency theory - a comparative discussion, including an assessment of their relevance to monetary reform, *Real-world economics review* (66).

URL <http://www.paecon.net/PAERReview/issue66/Huber66.pdf>, accessed 28 May 2014.

Kregel, J. (2012). Minsky and the narrow banking proposal: No solution for financial reform, *Public Policy Brief*, *Levy Institute*.

URL <http://www.levyinstitute.org/publications/minsky-and-the-narrow-banking-proposal>, accessed 28 May 2014.

Pettifor, A. (2013). The power to create money 'out of thin air' - understanding capitalism's elastic production of money and moving on beyond Adam Smith and 'fractional reserve banking' - a review essay of Geoffrey Ingham's *Capitalism*, *Prime economics*.

URL <http://www.primeeconomics.org/wp-content/uploads/2013/01/The-power-to-create-money-out-of-thin-air5.pdf>, accessed 28 May 2014.

**Author contact:** [trond.andresen@itk.ntnu.no](mailto:trond.andresen@itk.ntnu.no)

---

### SUGGESTED CITATION:

Trond Andresen, "The Central Bank with an expanded role in a purely electronic monetary system", *real-world economics review*, issue no. 68, 21 August 2014, pp. 66-73,  
<http://www.paecon.net/PAERReview/issue68/Andresen68.pdf>

You may post and read comments on this paper at <http://rwer.wordpress.com/comments-on-rwer-issue-no-68/>