MONEY CREATION: ROLE OF BANK LIQUIDITY

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ABSTRACT

The state of bank liquidity, measured as the banks' net excess reserves (NER) with the central bank, is a critical element of the successful implementation of monetary policy. Central banks have absolute control over NER and manipulate it to bring about a positive NER (in QE periods) to drive interest rates down, or a negative NER in order to have control over interest rates. The latter condition aims at influencing the exogenous force, the demand for bank loans. Satisfaction of the demand for bank loans has the simultaneous outcome of deposit money creation.

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There is no such thing as exogenous money; only endogenous money creation exists. A central bank is able to exactly control the extent of money creation exactly (under the theoretical monetary base-focused monetary policy model – see below), but money creation which takes place under this model is still endogenous: new bank loans create new bank deposits (that is, money). A demand for bank loans must exist for a bank to grant loans, which is an exogenous force.

The money stock is comprised of two parts: notes and coins (N&C) and bank deposits (BD) held by the domestic non-bank private sector (NBPS):

M = N&C + BD (held by the NBPS).

There are two monetary policy models:

- Monetary base-focused monetary policy.
- Interest rate-focused monetary policy.

The former is a theoretical model, and it rests on the money multiplier (m = 1 / r) [r = the reserve requirement (RR) ratio applied to bank deposits]. The growth in BD money is related to r, in that it can only increase up to the extent of excess reserves (ER) created by the central bank (CB) times m:

Money growth = ER x (1 / r).

Thus, if the CB creates ER[2] to the extent of LCC[3] 10 billion (see Balance Sheets (1 – 2) by purchasing government bonds from the banks, the banks may make loans

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(assume to the NBPS), which create deposits (money) simultaneously, to the extent of (see Balance Sheets 3 – 4):

Money growth = ER x (1 / r)
= LCC 10 billion x (1 / 0.1)
= LCC 100 billion.

BALANCE SHEET 1: BANKS (LCC BILLIONS)			
Assets		Liabilities	
Bonds Reserves (total reserves - TR) (ER = +10) (RR = 0)	-10 +10		
Total	0	Total	0

BALANCE SHEET 2: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
Bonds	+10	Deposits: Banks (TR) (ER = +10) (RR = 0)	+10
Total	+10	Total	+10

BALANCE SHEET 3: BANKS (LCC BILLIONS)			
Assets		Liabilities	
Loans to private sector Reserves (TR) (ER = -10) (RR = +10)	+100 0	Deposits: Private sector (M3)	+100
Total	+100	Total	+100

BALANCE SHEET 4: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
		Deposits: Banks (TR) (ER = -10) (RR = +10)	0
Total	0	Total	0

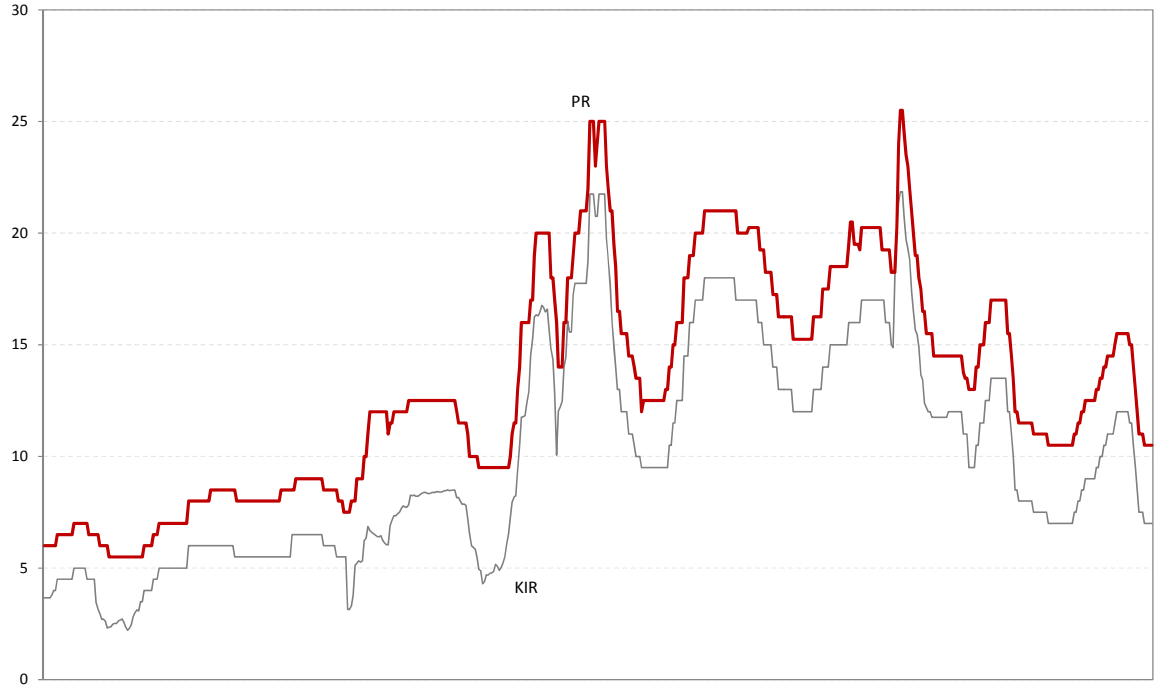
Note the shift from ER to RR in Balance Sheets 3 – 4, and the fact that the banks now exactly comply with the RR, and can lend no further. Note also that deposit money creation took place endogenously, as a result of an exogenous force: a demand for bank loans (which was assumed above).

[2] We ignore the fact that N&C also rank as reserves, in the interests of simplicity. Doing so does not detract from the principle. In some countries this does apply (South Africa in one).
[3] The currency ("corona") code of a fictitious country, Local Country.

As noted earlier, this model is a theoretical monetary policy model. It was applied briefly in the distant past, with dire consequences in terms of volatile interest rates. It was abandoned for this reason – interest rates are a significant input in business decision-making.

The vast majority of countries adopted the *interest rate-focused monetary policy model* many decades ago. In a nutshell, it amounts to control of the banks' prime lending rate (PR) (and other lending rates which are usually benchmarked on PR), which is achieved by the creation (in normal, non-QE-policy times) of a liquidity shortage (LSh) (= borrowed reserves - BR) in order to make the central bank's policy or key interest rate (KIR effective). An effective KIR affords the central bank control over PR and, therefore, the demand for bank loans (as discretion is exercised it is not an exact science). The control a central bank has is demonstrated in the relationship between PR and KIR for a particular country[4] for a period of over 50 years (see Figure 1; the correlation coefficient is 0.98). This country ensures that the banks are in a borrowed reserves condition at all times – to ensure that the KIR remains effective.

Figure I: KIR & PR (month-ends for over 50 years)



The reserves required by banks, as they make loans and create deposits, are accommodated by the central bank, as part of its control over the LSh (= BR). An example of central bank accommodation (in the form of on-demand loans - BR - from the central bank, which is the case in the practice in normal times) is presented in Balance Sheets 5 – 6 (banks make loans of LCC 1 000 billion to the NBPS, which creates LCC 1 000 billion of new deposits; the RR ratio is 10% of deposits):

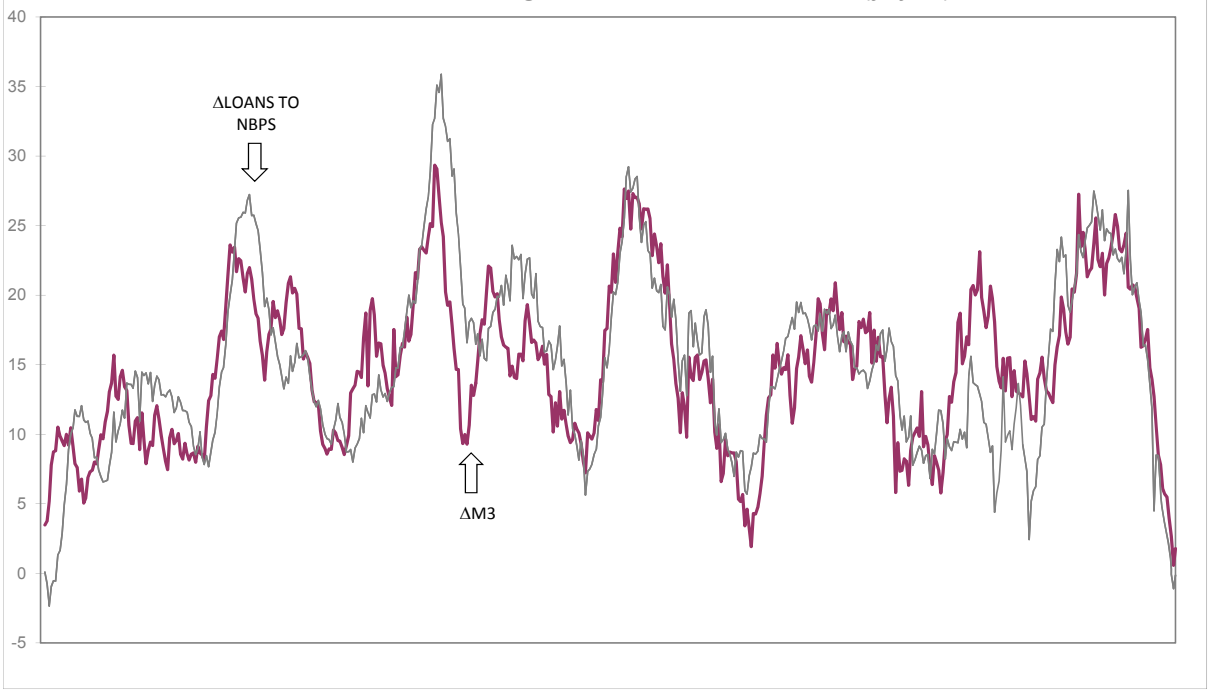
[4] South Africa.

BALANCE SHEET 5: BANKS (LCC BILLIONS)			
Assets		Liabilities	
Loans to NBPS Reserves at CB (TR) (ER = 0) (RR = +100)	+1 000 +100	Deposits of NBPS (money) Loans from CB (BR) @ KIR	+1 000 +100
Total	+1 100	Total	+1 100

BALANCE SHEET 6: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
Loans to banks (BR) @ KIR	+100	Bank reserves (TR) (ER = 0) (RR = +100)	+100
Total	**+100**	**Total**	**+100**

The central bank is accommodative, that is, supplies the BR on demand, as part of its policy to ensure that the BR condition is on-going.

Figure 2: M3 & loans to NBPS (yoy %)



The above is an example of where bank liquidity is kept “short”, that is, when the banks collectively are indebted to the CB (a BR condition exists). However, this policy exists (in slightly different forms in different countries) in normal times - when the money stock is increasing (the outcome of bank lending) and the CB controls PR via its policy rate (KIR), as indicated in Figure 1.Through this mechanism, it influences the exogenous force, the demand for bank loans, and therefore the growth rate in the money stock. The relationship between the growth rates in bank loans to the NBPS and M3 (for a period of over 50 years) is shown in Figure 2.

Conditions do arise when central banks wish to drive interest rates to the lowest levels possible. These periods usually arise at the end of recessions and continue into low-growth periods, and the policy (now known as a QE policy) is designed to encourage bank lending / money creation. By the purchase of bonds the central bank creates ER for the banks. As banks cannot use, create or destroy central bank money (CBM), the only way they can utilise the ER is to make loans (encouraged by the low lending rates), which creates new deposits, which carry a RR. Through this mechanism, the dividing line between ER and RR is shifted in favour of the latter, as shown in Balance Sheets 1 – 4.

It should be evident that the RR is only one of many factors which influence bank liquidity. In order to elucidate, we present the simplified (we have left out unimportant items such as *other assets*, *other liabilities* and *capital and reserves*) balance sheet of the central bank in Balance Sheet 7.

BALANCE SHEET 7: CENTRAL BANK (LCC BILLIONS)			
Assets		**Liabilities**	
D. Foreign assets (FA) E. Loans to government (LG)[5] G. Loans to banks (BR)	1 800 2 100 100	A. Notes & coins (N&C) B. Deposits: 1. Government sector 2. Banks (TR) (a. ER = 0) (b. RR = 500) C. Loans: Foreign sector	2 000 1 000 500 500
Total	**4 000**	**Total**	**4 000**

From this balance sheet we can create what can be called a *bank liquidity analysis* (BLA). On the left of the identity we have the net excess reserves (NER) of the banking sector, an indicator of bank liquidity (as far as CBM is concerned). This is made up of the ER of the banking sector (item B2a) less the extent of loans to the banking sector (at the KIR), that is, the liquidity shortage (LSh = BR = item F):

$$NER = B2a - F.$$

On the right hand side of the identity we have all the remaining liability and asset items:

$$NER = B2a - F = (D + E) - (A + B1 + B2b + C).$$

If we group the related liability and asset items we have:

$$NER = B2a - F = (D - C) + (E - B1) - A - B2b.$$

Using the numbers in Balance Sheet 7, we have NER and its counterparts (in LCC billion) as follows:

$$NER = B2a - F = (D - C) + (E - B1) - A - B2b$$

[5] Marketable (Treasury bills and bonds) and non-marketable (for example: loans to local authorities), but usually marketable only, for purposes of open market operations (OMO).

= 0 – 100 = (1 800 – 500) + (2 100 – 1 000) – 2 000 – 500
= – 100 = 1 300 + 1 100 – 2 000 – 500
= – 100.

It will also be evident that from one date to another the changes (Δ) as well as the balance sheet sources of changes (BSSoC) can be calculated:

ΔNER = Δ(D – C) + Δ(E – B1) – ΔA – ΔB2b.

Thus, a change in the NER of the banking system is *caused* by changes in the remaining balance sheet items (that is, the BSSoCs):

ΔNER =

Δ(D – C) = net foreign assets (NFA)
+ Δ(E – B1) = net loans to government (NLG)
– ΔA = N&C in circulation
– ΔB2b = required reserves (RR).

The actual sources of changes (ASoC) are the transactions that underlie the BSSoC. It will be evident that the instruments of open market operations (OMO) are NFA (usually forex swaps), NLG (purchases / sales of government securities in the main) and that the RR ratio (*r*) can also be used (rarely so in practice) to also manipulate bank liquidity (NER). For example, the sale of forex to a bank (a forex swap) will decrease NER [(increase the LSh (item F)]. The BSSoC is a decrease in NFA. Similarly, the sale of Treasury bills to the banks will decrease NER (increase the LSh). The BSSoC is a decrease in NLG. Thus, the CB has total control over bank liquidity (assuming efficient markets).

BALANCE SHEET 8: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
D. Foreign assets (FA) E. Loans to government (LG)[6] G. Loans to banks (BR)	1 800 2 300 0	A. Notes & coins (N&C) B. Deposits: 1. Government sector 2. Banks (TR) (a. ER = 100) (b. RR = 500) C. Loans: Foreign sector	2 000 1 000 600 500
Total	4 100	Total	4 100

It will also be evident that in a recessionary period (assuming the above numbers to be in place) the CB can change the NER condition of the banking sector at will [to a liquidity surplus (LSu) under a QE policy] by, for example, purchasing LCC 200 billion bonds from the banks (see Balance Sheet 8). This will result in (in LCC billions):

ΔNER = +200 billion

[6] Marketable (Treasury bills and bonds) and non-marketable (for example: loans to local authorities), but usually marketable only, for purposes of open market operations (OMO).

BSSoC = ∆NLG = +200 billion.

The *outstanding* NER condition will be (in LCC billions):

NER = B2a – F
= 100 – 0
= 100.

Is this a robust analysis? Because a balance sheet balances, one can create an identity for any item. It is robust because it is based on the fact that all interbank settlement takes place over the accounts which banks are required to maintain with the CB. For example, when the central bank sells government bonds (LG in its balance sheet) to the banks, the banks' accounts with the CB will be debited (= a decline in TR). If the banks have no ER, they are obliged to take loans (BR = item F) from the CB at the KIR (assuming the bond sale = LCC 100 million):

NER = B2a – F
= 0 – 100
= – LCC 100 million
BSSoC = ∆NLG = – LCC 100 million.

The ASoC is the OMO sale.

The above demonstrates that bank liquidity (NER) is firmly under the control of the CB. Most countries' monetary policy approach (that is, the interest rate-focused monetary policy) rests on creating and maintaining a liquidity shortage (in normal circumstances) in order to make the KIR effective. But, as discussed earlier, in abnormal times, when a QE policy is required, the CB is able to bring about an LSu condition, rendering the KIR irrelevant, thus driving down interest rates to low levels.

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