3 Management of money & banking system

3.1 Learning outcomes

After studying this text the learner should / should be able to:

1. Elucidate the central banking function "lender of last resort".
2. Explain the central bank's role in currency (notes and coins) management.
3. Describe the central bank function "banker to private sector banks".
4. Detail the central bank function "settlement of interbank claims".
5. Expound on the significance of the central bank's role in bank supervision.
6. Explicate the central bank's role in the supervision of the payments system.
7. Elucidate the central banking function "management of gold and foreign exchange reserves".

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3.2 Introduction

Formulation and implementation of monetary policy (aimed at achieving and maintaining price stability)
Formulation of monetary policy framework
Influence on level of interest rates (through bank liquidity management)
Open market operations
Banker and advisor to government
Banker to government
Public debt management
Administration of exchange controls
Management of the money and banking system
Lender of last resort (note: not a monetary policy function)
Currency management (notes and coins)
Banker to private sector banks
Settlement of interbank claims
Bank supervision
Supervision of payments system
Management of gold and foreign exchange reserves
Development of debt market
Provision of economic and statistical services
Provision of internal corporate support services and systems

Table 1: Functions of central banks

A significant component of financial stability is proficient management of the money and banking system. As can be seen in Table 1 the central bank's function *management of the money and banking system* carries a number of responsibilities. These are critical responsibilities and, as will be seen, many of them overlap with the monetary policy function.

In order to fully appreciate (some of) them, we need to discuss the function "settlement of interbank claims" first. The following is the order of the sections:

- Banker to private sector banks.
- Settlement of interbank claims.
- Supervision of payments system.
- Lender of last resort.
- Currency (notes and coins) management.
- Bank supervision.
- Management of foreign assets.
- Development of debt market.

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3.3 Banker to private sector banks

As we have seen, a CB acts as the custodian of the reserves that banks are legally required to hold with the CB (the RR). It is called the reserve requirement, and it is a ratio (r) of bank deposits (or bank liabilities in some cases). The CB also has the authority to change the reserve requirement ratio in order to influence bank liquidity, although this is rarely used as a tool – because it is able to undertake OMO. It tends to be utilised only in countries with fledgling financial markets.

A CB[15] elucidates in this regard:

> *"The…Bank acts as custodian of the cash reserves that banks are legally required to hold or prefer to hold voluntarily with the Bank. The Bank has the authority to change the minimum cash reserves that banks are required to hold and can use such adjustments to influence bank liquidity and the amount of money in circulation."*

As we have seen, in some countries the banks are required to maintain two accounts with the Reserve Bank, *reserve accounts* and *current accounts* (the latter are also known as *free balance accounts* or *settlement accounts*). The former are the accounts in which the legally required amount of reserves must be held at all times, and the latter the accounts in which the clearing / settlement of interbank claims takes place. In some countries the banks are required to have just one account for the RR and settlement of interbank claims. We assume one account called the *reserve account*.

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The banks' balances on their reserve accounts are usually kept to the minimum required (the RR), for a simple reason: the CB does not pay interest on the RR or the ER of the banks (in most cases). Thus, banks place free balances they may have with deficit banks during the interbank clearing process.

A caveat is required: this is the norm; in exceptional circumstances, central banks have been known to bring about a situation in which the banks hold ER for extended periods – in order to ensure that interest rates are at a minimum, the motivation being stimulation of the economy. In essence this means that the banks are encouraged to make loans and create new money (deposits). As we have seen, banks only make loans if there is a demand for loans, and underlying the demand for loans is economic activity (C + I = GDE).

It may be useful to take the reader back to the origin of this CB function. It began in the days of the London silver- and goldsmiths in the 17th century. For many reasons (such as plundering by the king when coins were kept at the Mint in the Tower of London), the London wealthy began making use of the secure facilities of the goldsmiths for their wealth, which was then comprised of precious metal coins. They *deposited* their coins with the goldsmiths and the latter issued a *receipt* for the gold.

It was later found that these receipts were a convenient *means of payments* for goods and services, and it came to pass that the goldsmiths were requested to split *receipts* into smaller denominations and to issue them without being payable to a person (i.e. to *bearer*). For example, if Mr A deposited 100 one pound gold coins the goldsmith-banker would be asked for 100 receipts, each with a face value of one pound. These receipts became the principal means of payment, i.e. money. Thus at this stage the amount of money in circulation was the sum total *of gold coins in circulation plus goldsmith-banker receipts in the possession of the public*.

The receipts became money because they were *convertible into gold*, i.e. any holder of a receipt could present it to the relevant goldsmith and demand gold. At that time loans were made by the goldsmiths in the form of the gold in their possession. The goldsmiths over time became more involved in banking business which led to the name: goldsmiths-bankers, and later just bankers.

It did not take long for a goldsmith-banker to realise that if their receipts were being used as the means of payment, then loan demand could be satisfied not by gold coins, but by the issue of new goldsmith-banker receipts. This was an historical event of momentous proportions and changed the economics of the world forever. The most significant event in banking – money creation by the new banks – was born, which endures to this day. It liberated economies from the often stifling shortage of precious metals from which money was struck. It is appropriate from here on to refer to goldsmith-banker receipts as *bank notes* and to the goldsmith-banker as *bank*.

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BALANCE SHEET 1: BANK (POUNDS)			
Assets		**Liabilities**	
Gold coins (1 000 000 of one pound each) (1)	1 000 000	Bank notes / receipts (1)	1 000 000
Total	1 000 000	Total	1 000 000

An example is appropriate: Balance Sheet 1 indicates a bank's stock balance sheet before the making of loans by the issue of new notes. We assume that gold coins had a face value of one pound (which was not the case then). All bank notes were covered in full by gold. Balance Sheet 2 (step 2) shows the balance sheet after loans are made with the issue of new bank notes to the value of 500 000 pounds. Now, bank notes are covered by gold to the extent of 0.67% (1 000 000 / 1 500 000).

BALANCE SHEET 2: BANK (POUNDS)			
Assets		**Liabilities**	
Gold coins (1 000 000 of one pound each) (1) Loans (2)	1 000 000 500 000	Bank notes / receipts (1) Bank notes / receipts (2)	1 000 000 500 000
Total	1 500 000	Total	1 500 000

The next step, bank deposit money, was a logical inevitability: the opening of current accounts (then called "running caches") from which payments are made to other accounts by means of an instrument of transfer: the cheque. Thus money (the *means of payments*) became bank notes and gold coins (N&C), and bank deposits (BD):

M = N&C + BD (in the possession of the NBPS[16]).

It did not take long for the banks to realise that loans could be made by simple bookkeeping entry: credit the current account: see Balance Sheet 3 (step 3: the initial credit to, and after spending by, the borrower).

BALANCE SHEET 3: BANK (POUNDS)			
Assets		**Liabilities**	
Gold coins (1 000 000 of one pound each) (1) Loans (2) Loans (3)	1 000 000 500 000 500 000	Bank notes / receipts (1) Bank notes / receipts (2) Current account deposits (3)	1 000 000 500 000 500 000
Total	2 000 000	Total	2 000 000

It will be evident that current account balances are convertible into bank notes and that the *gold coverage ratio* now becomes 0.5 or 50% (1 000 000 / 2 000 000). This ratio became important because the banks realised that there is a limit to their extension of loans / deposits: they must hold sufficient gold reserves to meet demand for gold coins. This is the origin of the reserve requirement (RR): a self-imposed limit to new bank loans / creation of new deposits (note: they are counterparts).

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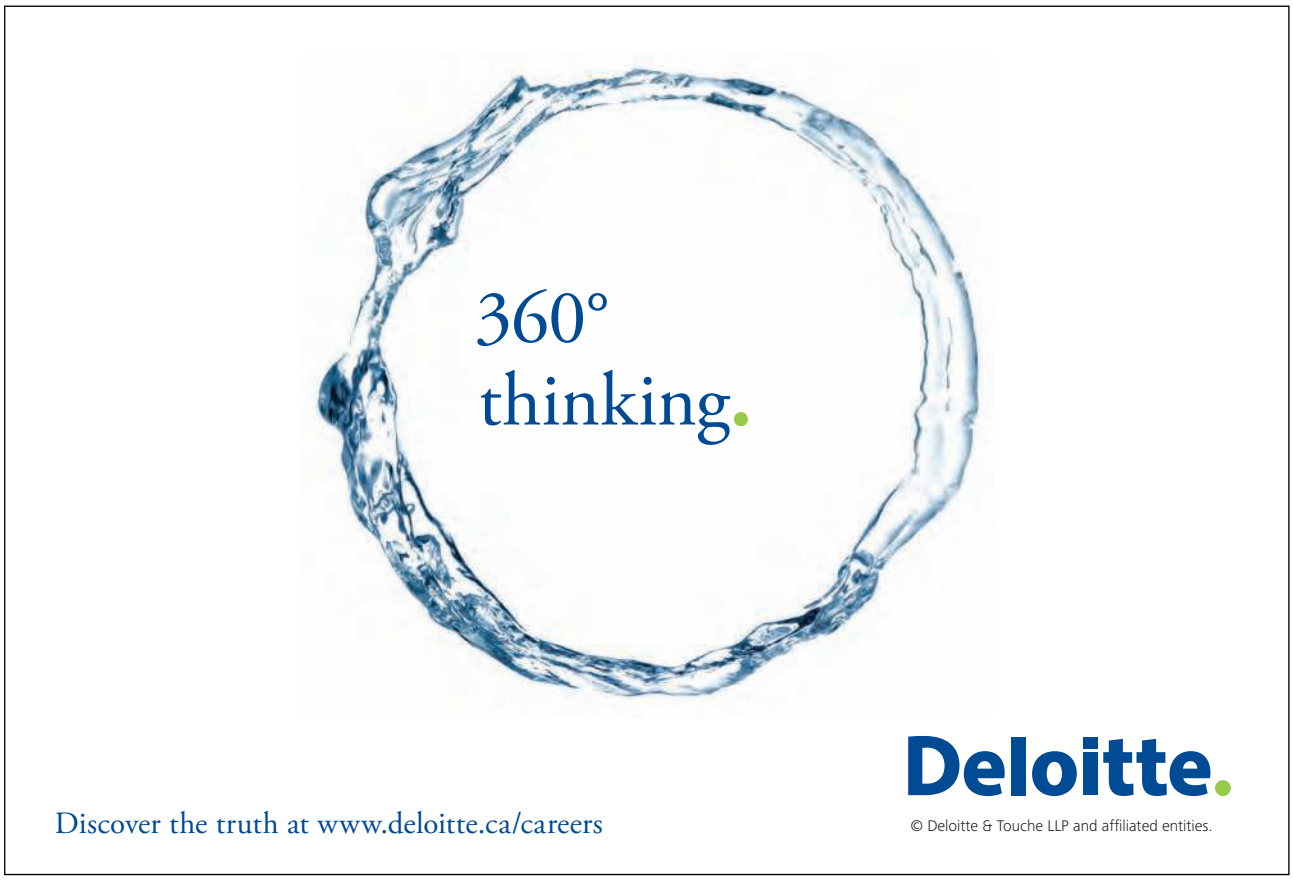
Thus, it came to pass that new loans could only be made when new deposits of gold coins were made. If the acceptable gold reserve ratio requirement (the *r*) is 10%, and a deposit of gold coins of 100 000 pounds were made, then the banks could extend new loans to the extent of:

$$\begin{aligned} \text{New loans} &= \text{new reserves} \times (1 / r) - \text{new reserves} \\ &= 100\,000 \text{ pounds} \times 0.10 - 100\,000 \\ &= 1\,000\,000 - 100\,000 \\ &= 900\,000 \text{ pounds.} \end{aligned}$$

BALANCE SHEET 4: BANK (POUNDS)			
Assets		**Liabilities**	
Gold coins (1)	+100 000	Deposits (1)	100 000
Loans (2)	+900 000	Deposits (2)	900 000
Total	1 000 000	Total	1 000 000

Thus, a fresh 100 000 pounds of gold was "backing" 1 000 000 in new deposits (liabilities) = 0.10 or 10%.



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In 1875, a scholar[17] on money matters wrote (based on studies that indicated that an *r* of 5% is the norm):

> *"Thus, the whole fabric of our vast commerce is found to depend upon the improbability that the merchants and other customers of the banks will ever want, simultaneously and suddenly, so much as one-twentieth part of the gold money which they have a right to receive on demand at any moment during banking hours."*

If he was exasperated in 1875, he would have been more so when the gold standard was abolished in the 20th century. This event has a long and intricate history; suffice it to say that there were periods of uncertainly when convertibility of bank liabilities into gold was suspended. Once abolished in the 20th century, there was nothing "backing" bank liabilities. The acceptable reserves (RR) then became bank notes of and deposits at the CB, and now some countries have abolished CB notes as ranking as reserves (for many reasons).

This paved the way for "fractional reserve banking", where central banks are able to control bank lending / deposit creation by restricting the amount of reserves created (which is CB money – CBM – over which central banks have a monopoly, i.e. no bank except the CB can create CBM.

This paved the way for excessive money creation and hyperinflation, when central banks were pressured by governments to create reserves on demand. The term *hyperinflation* was coined during the first half of the 20th century.

Today, most central banks do not rely on bank reserves to curb bank lending / deposit creation, but on interest rates. The RR is but one of many factors that influence bank liquidity, as we have seen. In normal times central banks create a permanent liquidity shortage and charge the banks the KIR in order to influence bank lending rates.

In conclusion, we present a brief history of the first deposit by a bank at a central bank. The Bank of England, which only later morphed into a CB, was formed in 1694, in competition with the goldsmith-bankers / banks. It was afforded the sole right to issue banks notes (there were a few exceptions for a while), much to the chagrin of the banks. It came to pass that the banks made deposits with the Bank of England, and they regarded deposits as reserves, in addition to gold coins.

The first goldsmith-bankers / banks to open accounts with the Bank of England were the firms of Richard Hoare (later C Hoare & Co, which still exists as a London private banker today – see Box 1) and Freame & Gould (the forerunner of Barclays Bank). They opened their accounts with the Bank of England in March 1695[18], and in the course of time the other banks followed suit. This was a presaging of the Bank of England, in its later role of central bank, performing the function of *custodian of the reserves of banks*.

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BOX 1: C HOARE & CO, LONDON

Photo: AP Faure.
The bank started as a goldsmith in 1672 at the sign of the "Golden Bottle in Cheapside" (then the style of physical address).
It relocated to Fleet Street in 1690. A visit to their museum is most illuminating and educational. See www.hoarebankers.co.uk.
The bank is still owned and run by the Hoare family.

3.4 Settlement of interbank claims

A significant function of central banks is the provision of facilities for the central clearance and settlement of claims among banks, originating from cheque and other payments made. Settlement of claims among banks in the UK started with the goldsmith-bankers in the 17th century (i.e. in the absence of a CB).

An example may be helpful: there are three banks, all of which have a so-called "out-clearing book" indicating new deposits they have received in the form of cheques drawn on the other banks (see Tables 1–3). For example, Bank A has a new deposit of 2 000 pounds from Client A; the cheque is drawn on Bank B; thus, Bank B owes Bank A 2 000 pounds. Similarly, Bank C has a new deposit of 5 000 pounds from Client G; the cheque is drawn on Bank A; thus, Bank A owes Bank C 5 000 pounds.

	BANK B	BANK C	TOTAL
CLIENT A	2 000		2 000
CLIENT B		5 000	5 000
CLIENT C		1 000	1 000
TOTAL	2 000	6 000	8 000

Table 1: Out-clearing book: Bank A (pounds)

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	BANK A	BANK C	TOTAL
CLIENT D	3 000		3 000
CLIENT E	3 000		3 000
CLIENT F		4 000	4 000
TOTAL	6 000	4 000	10 000

Table 2: Out-clearing book: Bank B (pounds)

	BANK A	BANK B	TOTAL
CLIENT G	5 000		5 000
CLIENT H		1 000	1 000
CLIENT I	2 000		2 000
TOTAL	7 000	1 000	8 000

Table 3: Out-clearing book: Bank C (pounds)

The banks get together in a physical location, present their claims against the other banks, and receive the claims against themselves of the other banks (into *in-clearing books*). The outcome is presented in Table 4. Bank B has gained 7 000 pounds in deposits, while Bank A lost deposits of 5 000 pounds and Bank C lost deposits of 2 000 pounds. Initially, the individual banks settled the amounts between themselves:

- Bank A paid Bank B 4 000 pounds (6 000 – 2 000).
- Bank A paid Bank C 1 000 pounds (7 000 – 6 000).
- Bank C paid Bank B 3 000 pounds (4 000 – 1 000).

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		CLAIMS ON			
		BANK A	BANK B	BANK C	TOTAL
CLAIMS AGAINST	BANK A	X	6 000	7 000	13 000
	BANK B	2 000	X	1 000	3 000
	BANK C	6 000	4 000	X	10 000
	TOTAL	8 000	10 000	8 000	26 000

Table 4: Total claims on and against (pounds)

The amounts were settled in bank notes initially, and the balance sheets of the banks will have changed as indicated in Balance Sheets 5–7.

BALANCE SHEET 5: BANK A (POUNDS)			
Assets		**Liabilities**	
		Deposits Bank notes issued (Bank B) Bank notes issued (Bank C)	-5 000 +4 000 +1 000
Total	0	Total	0

BALANCE SHEET 6: BANK B (POUNDS)			
Assets		**Liabilities**	
Bank notes (Bank A) Bank notes (Bank C)	+4 000 +3 000	Deposits	+7 000
Total	+7 000	Total	+7 000

BALANCE SHEET 7: BANK C (POUNDS)			
Assets		**Liabilities**	
Bank notes (Bank A)	+1 000	Deposits Bank notes issued (Bank B)	-2 000 +3 000
Total	+1 000	Total	+1 000

Later when current accounts evolved that banks made loans to one another (called interbank loans). Their balance sheets would have indicated the changes shown in Balance Sheets 8–10.

BALANCE SHEET 8: BANK A (POUNDS)			
Assets		**Liabilities**	
		Deposits Interbank loan (Bank B) Interbank loan (Bank C)	-5 000 +4 000 +1 000
Total	0	Total	0

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BALANCE SHEET 9: BANK B (POUNDS)			
Assets		Liabilities	
Interbank loan (Bank A) Interbank loan (Bank C)	+4 000 +3 000	Deposits	+7 000
Total	+7 000	Total	+7 000

BALANCE SHEET 10: BANK C (POUNDS)			
Assets		**Liabilities**	
Interbank loan (Bank A)	+1 000	Deposits Interbank loan (Bank B)	-2 000 +3 000
Total	+1 000	Total	+1 000

Jevons[19] tells us that a formal Clearing House (CH) first emerged in London in about 1775. A Clearing House's main function is to net-off reciprocal claims and to ensure secure settlement. Table 5 presents an example of the net outcome of the CH numbers. Instead of the banks settling debts as indicated above, under a CH system the number of deals is significantly reduced. In our example, settlement takes place in that Bank A and Bank C settle not with one another, but only with Bank B (see Balance Sheets 11–13).

	BANK A	BANK B	BANK C	TOTAL
CLAIMS ON	8 000	10 000	8 000	26 000
CLAIMS AGAINST	-13 000	-3 000	-10 000	-26 000
TOTAL	-5 000	7 000	-2 000	0

Table 5: Net claims and settlement (pounds)

BALANCE SHEET 11 BANK A (POUNDS)			
Assets		**Liabilities**	
		Deposits Interbank loan (Bank B)	-5 000 +5 000
Total	0	Total	0

BALANCE SHEET 12: BANK B (POUNDS)			
Assets		**Liabilities**	
Interbank loan (Bank A) Interbank loan (Bank C)	+5 000 +2 000	Deposits	+7 000
Total	+7 000	Total	+7 000

BALANCE SHEET 13: BANK C (POUNDS)			
Assets		**Liabilities**	
		Deposits Interbank loan (Bank B)	-2 000 +2 000
Total	0	Total	0

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Jevons[20] informs that (as the book was published in 1875 the "more recently" referred to could be between 1860 and 1870):

> *"More recently a suggestion…was carried into effect, and the balances were paid by drafts upon the bank of England, in which bank each city banker deposits a large part of his spare cash."*

This heralded to CB function of central clearing and settlement, the central point being the banks' accounts at the Bank of England. Using the above example, the changes in the banks' balance sheets would be as indicated in Balance Sheets 14–17.

BALANCE SHEET 14: CENTRAL BANK A (POUNDS)			
Assets		**Liabilities**	
		Banks' reserve accounts	
		Bank A	-5 000
		Bank B	+7 000
		Bank C	-2 000
Total	0	Total	0

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BALANCE SHEET 15: BANK A (POUNDS)			
Assets		**Liabilities**	
Reserve account at CB	-5 000	Deposits	-5 000
Total	-5 000	Total	-5 000

BALANCE SHEET 16: BANK B (POUNDS)			
Assets		**Liabilities**	
Reserve account at CB	+7 000	Deposits	+7 000
Total	+7 000	Total	+7 000

BALANCE SHEET 17: BANK C (POUNDS)			
Assets		**Liabilities**	
Reserve account at CB	-2 000	Deposits	-2 000
Total	-2 000	Total	-2 000

All countries have an interbank clearing and settlement system, and most have an automated system, usually called an Automated Clearing Bureau (ACB). The netted amounts payable / received are delivered on the banks' CB accounts. Most countries also have a system for large payments, and these are not netted and settled in real time over banks' CB accounts. It is called the *real time gross settlement* (RTGS) system (note the absence the word *clearing*, which refers to netting). Where RTGS systems exist, the ACB systems remain but for small payments.

3.5 Supervision of payments system

In most countries there are three payments systems:

- RTGS system, for large payments.
- ACB system, for retail payments (cheques and ETFs).
- The payments system for the exchange of automatic teller machine (ATM) transactions between banks.

The three systems, and others that may exist, collectively, can be called the National Payment System (NPS). The systems all make use of the settlement facility at the CB, and because of this, the system is secure. When payments are made by banks they are made from their existing reserves. If these payments leave individual banks short of RR at the end of the business day, they are required to find the funds in the interbank market, or from the CB in the form of loans against collateral.

The CB is ultimately responsible for the NPS, and regards it as part of the foundations of financial stability.

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3.6 Lender of last resort

3.6.1 Introduction

It was seen above that with interbank settlements the amounts, colloquially-speaking, equal out; it is a zero-sum game. No new funds are created in, and no funds are lost to, the banking system: what one bank loses in deposits others gain. However, there are circumstances when this does not happen:

- When the CB does a local deal.
- When larger banks do not lend to smaller banks.
- When confidence in a particular bank wanes as a result of rumours or a *bank run*.

This section is about the last bullet point. However, we need to briefly elucidate the former two.

3.6.2 Central bank transactions

The first bullet point is a monetary policy issue. In the previous section the bank liquidity chronicle was outlined which, in essence, means that whenever the central bank dopes a deal in the financial markets, the deal has consequences for the liquidity of banks. A reminder is required (see Balance Sheet 18).

BALANCE SHEET 18: CENTRAL BANK (LCC MILLIONS)	
Assets	**Liabilities**
E. Foreign assets F. Government securities (claims on govt) G. Loans to banks (borrowed reserves – BR)	A. Notes and coins B. Deposits 1. Government 2. Banks (TR) a. RR b. ER C. Foreign loans D. Central bank securities

We presented the change identity:

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

A change in the NER (B2b – G) of the banking system is *caused* by changes in the other appropriately grouped balance sheet items (which can be called balance sheet sources of change – BSSoC):

$\Delta NER =$

$\Delta(E - C)$ = net foreign assets (NFA)
$+ \Delta(F - B1)$ = net loans to government (NLG)
$- \Delta A$ = notes and coins in circulation
$- \Delta B2a$ = RR
$- \Delta D$ = central bank securities (CBS).

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The *actual causes* of change are the transactions that underlie the BSSoC. As said before, if deposits move from banks to banks, the liquidity of the banking sector (NER) does not change. As soon as the CB does a deal or when bank deposits or the demand for N&C changes, NER changes. Thus we have two sets of BSSoC:

- Passive BSSoC.
- Operational BSSoC.

The passive BSSoC are:

- Bank deposit (money) volume changes: has a RR consequence. While this factor is not operational, the CB does have an indirect influence on it.
- Notes and coins (N&C) in circulation. This item is influenced by the demand for N&C from the public and the banks.

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The operational BSSoC are:

- NFA (usually forex swaps). For example, the sale of forex to a bank (a forex swap) will decrease NER (increase the LS).
- NLG (purchases / sales of government securities and changes in government deposits).For example, the sale of TBs to the banks will decrease NER (increase the LS).
- CBS issues. A new issue will decrease NER (increase the LS).
- Reserve requirement ratio (r) can be changed by the CB. An increase in r will decrease NER (increase the LS).

2.6.3 Large / small bank problem

In certain countries where the banking sector is dominated by large banks, there may be reluctance by the large banks to deal in the interbank market with the small banks. This means that as deposits move from small banks to large banks, the latter may not recycle the funds, and the interbank market will not clear. This in turn will mean that the CB will have to accommodate the small banks at KIR. An example: LCC 100 million deposits shift from small banks to large banks (see Balance Sheets 19–21).

BALANCE SHEET 19: CENTRAL BANK A (LCC MILLIONS)			
Assets		**Liabilities**	
		Banks' reserve accounts Small banks Large banks	 -100 +100
Total	0	Total	0

BALANCE SHEET 20: SMALL BANKS (LCC MILLIONS)			
Assets		**Liabilities**	
Reserve account at CB	-100	Deposits	-100
Total	-100	Total	-100

BALANCE SHEET 21: LARGE BANKS (LCC MILLIONS)			
Assets		**Liabilities**	
Reserve account at CB	+100	Deposits	+100
Total	+100	Total	+100

The obvious solution is an interbank transaction. However, if the large banks refuse to lend to the small banks there is little the CB can do, except perhaps encourage a collateral deal, or a repo deal. The transaction takes place, with collateral changing hands in the background.

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3.6.4 Confidence and the bank run

Confusion exists in respect of the expression *lender of last resort*. Lending to the banks for monetary policy purposes is deliberate and almost totally under the control of the CB. This is not *last resort* lending; it is *first resort* lending, in that it is engineered by the CB, because they desire to make the KIR effective.

The lender of last resort function of the CB is a *financial stability* issue. When a bank is "in trouble", as when confidence in the bank is lost leading to a bank run, that bank cannot meet all deposit demands (no bank is able to). The bank will fail if the lost deposits are not recycled back to it in the interbank market. The other banks will not entertain this (as in the above *large bank / small bank* example). Thus, it is left to the CB to decide to whether to rescue the bank.

This is an imperative issue, and it has systemic failure implications. It leads to the question: are certain banks too big to fail?

In this regard the Bank of England[21] asserts:

> *"Where a threat to the stability of the financial system is perceived to be present, the Bank may intervene to stand between an intermediary and the market place in order to facilitate payments and settlements, which might otherwise not be completed. In extreme cases, emergency financial support by the Bank might be provided, the so-called 'lender of last resort' (LOLR) function, but this is only done where the failure of one institution could bring down other, otherwise viable, institutions. This function may involve the Bank lending money to the failing institution to prevent its failure and hence to stop repercussions of its collapse from spreading through the financial system. This safety net exists to protect the stability of the financial system as a whole and not to protect individual institutions or their managers and shareholders.*
>
> *"The use of the Bank's LOLR function must be carefully justified in terms of the damage that would result to the financial system and the wider economy if intervention did not take place. This is because the LOLR role requires the use of public money and can also encourage excessive risk-taking (and hence financial fragility) if institutions believe that they will be bailed out whenever they experience difficulties. These risks mean the Bank and the FSA need to co-operate closely when a problem emerges, and inform the Treasury. The Bank also needs to satisfy its Court of Directors that any risks it accepts are manageable in relation to the Bank's own capital, when they are to be carried on the Bank's balance sheet."*

The opinion of the South African Reserve Bank:

> *"The Reserve Bank provides liquidity to banks during periods of temporary shortages of cash. This function is referred to as the Bank's 'lender-of-last-resort lending activities'.*

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"This function implies giving assistance to a bank facing liquidity problems. Such assistance is only given after a full analysis of the problems afflicting such a bank and the reasons they arose. The assistance will only be given on specific conditions, and its purpose is to prevent the bankruptcy of the bank receiving assistance, and/or avoid the danger of problems spreading to other banks through a 'run on such a bank'.

"A bankrupt bank will often not be able to repay its depositors, and the main purpose of special assistance is, therefore, to protect depositors. However, such assistance is never guaranteed or given automatically, and banks may accordingly go bankrupt, leading to severe hardships for depositors who lose their deposits at such a bank. The maintenance of stability in the banking system is, therefore, of the utmost importance to any country."

3.7 Currency (notes and coins) management

Because the CB (in most cases) has the sole right to manufacture, issue and destroy banknotes and coin in the country, it has the obligation to ensure that there are sufficient quantities of notes and coins of an acceptable quality in the public domain. This is to ensure that small transactions may continue unhindered.

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Most countries have a Mint (coins manufacturing company) and a bank notes manufacturing company. In Local Country, these companies are called the LC Mint Company (Pty) Limited and the LC Bank Note Company (Pty) Limited. They are subsidiaries of the CB. Some countries outsource this function to other countries.

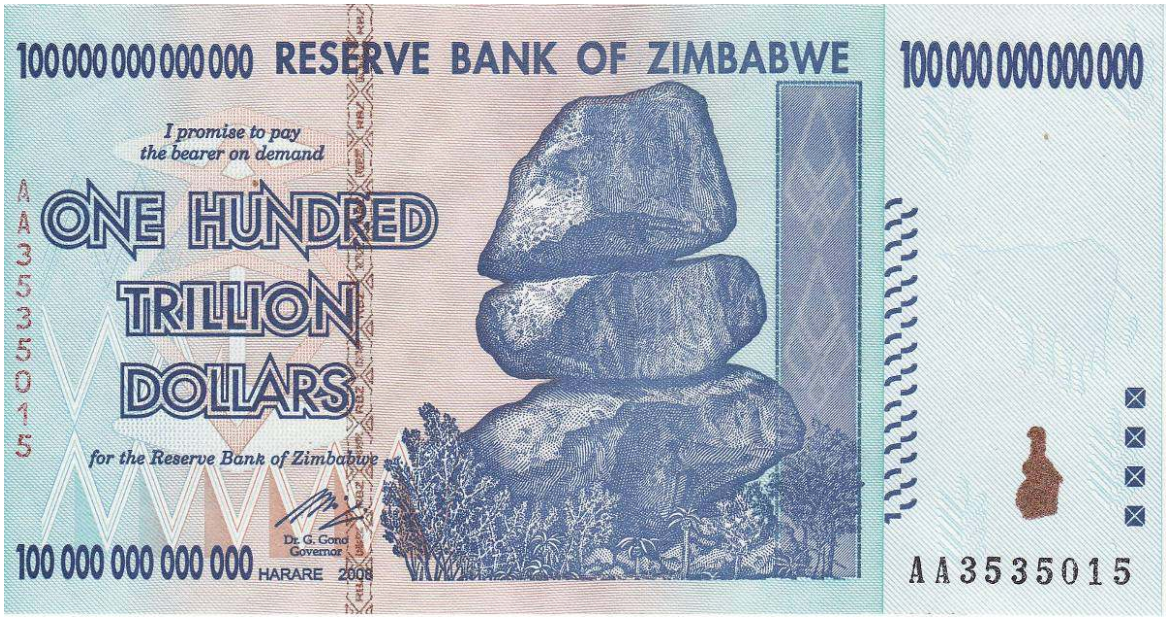
In this section we highlight the following:

- Legal tender.
- Sole right to issue.
- Denominations.
- Design.
- Issue of banknotes and coin.
- Managing quality of banknotes and coin in circulation.
- Managing public awareness for fraud prevention.
- Branch functions in respect of banknotes and coin.

All notes and coins issued by the CB are *legal tender*. This means they have to be accepted in payment (up to a certain amount). If not, the debt is extinguished.

As noted, the CB has the *sole right* to manufacture, issue and destroy banknotes and coins in Local Country. This right is bestowed on the CB by government and is contained in the statute regulating the CB.

BOX 2: LARGEST DENOMINATION BANK NOTE (WITH ZEROS)



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The *denominations* of bank notes and coins depend on many factors, but especially inflation and the exchange rate. For example, if Local Country experienced high inflation in the past and its exchange rate against the vehicle currency, the USD, is USD / LCC 205, it would most likely have had bank note denominations of LCC 1 000, LCC 500, LCC 100, LCC 50, LCC 20 and LCC 10. An example of a bank note in a past-hyperinflation country is shown in Box 2.

However, as Local Country's exchange rate against the USD is USD / 1.50, its bank note denominations are LCC 100, LCC 50, LCC 20, LCC 10, LCC 5 and LCC 1. One LCC made up of 100 cents and the denominations are: 50c, 20c, 10c, 5c, 2c and 1c. In past high inflation countries, the lower denominations will not exist.

As regards the *design* of bank notes and coins, all new designs must have the prior approval of government before they are placed into circulation. The same applies to denominations, although the CB makes recommendations.

As regards the *issue* of banknotes and coins the CB:

- calculates the country's new bank notes and coins requirements on an annual basis;
- places new bank notes and coins into circulation on an ongoing basis, according to demand; and
- ensures that sufficient new bank notes and coins are available to replace those that are removed from circulation due to "soil" and mutilation levels.

The quality of bank notes and coins in circulation is important for many reasons, including:

- To avoid fraudulent copying / printing (counterfeiting). Central banks follow the advances in technology and introduce security and technical features to keep ahead of the counterfeiter.
- To ensure that mechanical sorting and counting of notes and coins is possible.
- To ensure they are acceptable to members of the public and foreign visitors.
- To enhance the image of the country internationally.

The CB undertakes to reimburse soiled and mutilated bank notes and coins which are not wilfully damaged. Soiled and mutilated bank notes and coins are deposited at commercial banks who will in turn forward them to the CB for payment. The bank note covenant *I promise to pay the bearer on demand…for the Reserve Bank of…* (signed by the governor; see Box 2) means this. Its genesis is of course the convertibility of bank notes into gold.

Managing public awareness for fraud prevention is another function of the CB in this respect. It engages the public to be aware of the security features in bank notes and so prevent the spread of counterfeit bank notes.

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As regards *branch functions in respect of bank notes and coins*, most central banks have branches, and their main functions are to:

- Accept bulk deposits and withdrawals of bank notes and coins (but this mainly applies to bank notes). Bank notes and coins are non-interest-earning assets for banks. They therefore endeavour to keep their holdings to a minimum (in teller drawers and ATMs). Excess bank notes and coins are deposited at the CB (and their reserve accounts are credited), and withdrawals are made in anticipation of public demands (just before and during salary payment periods). These are paid for by debits to the banks' reserve accounts.
- Ensure that adequate bank notes and coins of acceptable quality are available.
- Inspect bank notes and coins and those not meeting the required quality standard are destroyed.

Although this is rarely used, members of the public have access to teller facilities at the branches for the replacement of soiled and mutilated bank notes and coins.

3.8 Bank supervision[22]

3.8.1 Introduction

The mission of central banks is the achievement and maintenance of financial stability. One of the foundations of financial stability is the regulation and supervision of the banking system with a view to attaining an efficient and sound banking system in the interest of depositors and the economy as a whole.

There are four elements to regulation / supervision:

- Institution of rules of conduct (regulation).
- Monitoring (observance of whether the regulations instituted are obeyed).
- Supervision (observance of the behaviour of participants).
- Enforcement (ensuring that the rules are adhered to).

This topic is so significant that it requires much attention, which we do not have space for here. Instead, we will cover in broad strokes:

- Rationale for regulation.
- Objectives of regulation.

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3.8.2 Rationale for regulation

The financial sector plays a pivotal role in the economy in that in its absence or partial failure the economic machine will be severely damaged. Imagine if the payments system failed or the banks are closed for extended periods (such as occurred in Argentina in 2001/2 – where segments of the economy were reduced to barter trade). The financial sector is also a major employer and is a major attractor of foreign exchange if soundly managed. This sector also carries the responsibility of allocating capital to the most productive uses.

The main rationale for government intervention is "market malfunction" which means that the financial system will produce a sub-optimal outcome in the absence of regulation. Thus, government intervention has welfare benefits. The consumer and the participants want regulation and are even prepared to pay for it.

The "rationale" for regulation amounts to "why regulation is necessary". There are a number of reasons:

- Systemic malfunction.
- Market imperfections.
- The moral hazard problem.
- Economies of scale.
- Consumer confidence and consumer demand for regulation.
- Supplier demand for regulation.

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We only touch upon the first-mentioned:

As we have mentioned, the financial *system* plays a vital role in the economy, and failure or malfunction of the system can disrupt economic activity severely. Banks are the only financial intermediaries that intermediate between all sectors of the economy (household, corporate, government and foreign) and all the other financial intermediaries. In addition, the banking system provides the payments and clearing systems for all transactions that take place in the economy. The failure of a major bank not only causes losses for depositors and shareholders, but also disrupts payments and the settlement of previously effected transactions immediately and possibly for some time.

3.8.3 Objectives of regulation

The ultimate objectives of regulation can be narrowly defined:

- Promotion of financial stability.
- Promotion of fair and healthy competition.
- Promotion of consumer protection.

The first two objectives may be rolled together under the heading "high degree of economic efficiency".

3.9 Management of foreign assets[23]

3.9.1 Introduction

Foreign assets are holdings of bank deposits in foreign banks and foreign securities such as USD treasury bills and GBP government bonds. The prudent management of the foreign asset reserves is an important function of the CB, and is covered under the following:

- Why do central banks hold foreign assets?
- The desired level of reserves.
- Foreign asset reserve management.
- The USD in foreign asset reserve management.

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3.9.2 Why do central banks hold foreign assets?

Central banks hold foreign assets / exchange for four main reasons:

- Central banks are the custodians of the foreign asset reserves of the country. Essentially they hold a stock of reserves on behalf of government and the public. In other words they are required by government to hold sufficient reserves
- To intervene, i.e. to sell or buy foreign exchange, in the foreign exchange market in order to influence the value of the currency. A stock of foreign exchange (forex) is required for this purpose.
- For transactions purposes. An example is to supply government with forex to enable it to repay a maturing foreign loan. Another is to be able to supply forex to the market if there is an unusually large demand for forex (for example if the airline needs to pay for the purchase of aircraft), in order to prevent a sudden fall in the exchange rate.
- Foreign (inward) investments tend to take place in countries that have large and stable forex reserves.

Foreign assets held by the CB are like a fund of assets, and all the portfolio management principles apply, including diversification. For this reason countries usually diversify their foreign asset portfolios into USD, EUR, GBP, JPY, CAD, and so on. Gold is usually also for diversification reasons.

3.9.3 The desired level of reserves

There is no fixed rule for the ideal level of forex reserves. The considerations in this regard are many, including:

- The extent of exchange rate volatility.
- A higher level of reserves enhances the credibility of the central bank's exchange rate policy.
- The level of reserves influences the image of the country in general.
- The "openness" of the economy, as measured by: foreign trade / GDP.
- The elasticity of the economy – its ability to adjust to changes in foreign capital flows and foreign trade.
- The cost of holding reserves; if local interest rates are higher than foreign rates, it is expensive to hold forex reserves.

While there is no fixed rule, there is a rule of thumb guideline: a level of forex reserves equal to the value of three months' imports.

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3.9.4 Foreign asset reserve management

As indicated earlier, the management of forex reserves of a country embraces all the principles expounded in portfolio management, except that here the main risk is currency risk. However, currency risk is largely "diversified away" (as in the case of asset-specific risk) by being invested in the major countries: the major currencies exhibit reciprocal fluctuations, so that the outcome is minimal risk if the CB invests in the major currencies in equal proportions. Figure 1 illustrates the tradition picture in risk / diversification space: as the number of securities held increases, risk (volatility) is reduced. In the case of foreign reserves, the number of currencies held does not have to be vast: assets denominated in USD, GBP, EUR, CAD, JPY and CNY are sufficient.

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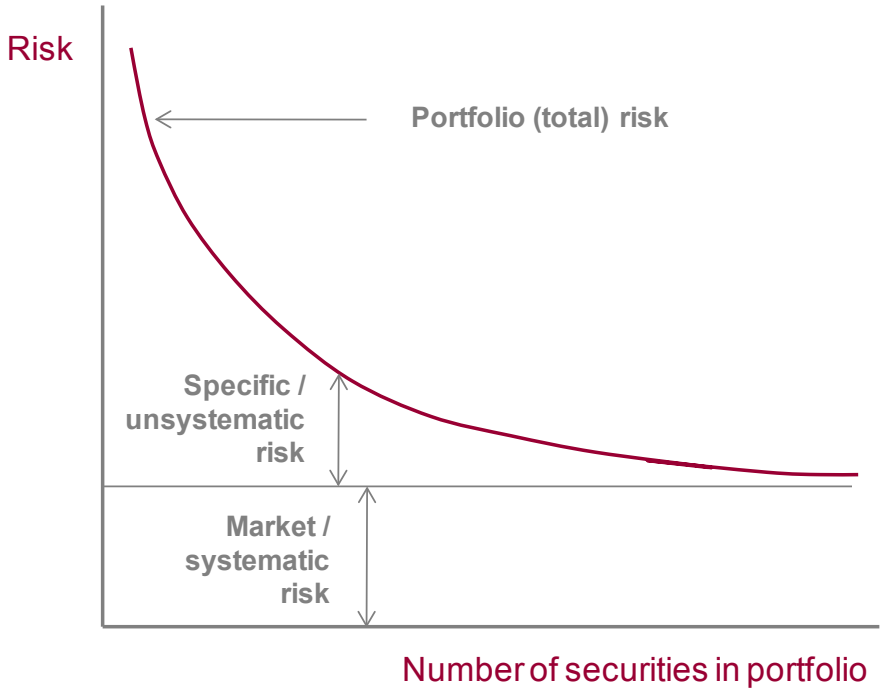

Figure 1: risk and diversification

Other considerations relating to foreign currency assets include:

- The type of instrument.
- The maturity profile (3-month GBP treasury bills or GBP 10-year treasury bonds).
- The establishment of limits for specific assets.
- The use of a management information system for:
  - measuring exposures to risks;
  - ensuring that these risks are managed; and
  - the measurement of performance.
- The use or not of external fund managers. Generally, central banks manage their own portfolios, for reasons of security, confidentiality, costs and image (central banks do not want it known that they do not have the expertise to manage their own portfolio).

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3.9.5 The USD in foreign asset reserve management

Despite the benefits of diversification, the USD remains the primary investment medium (deposits, treasury bills, bonds, etc.). The relative importance of the USD in foreign asset holdings can be attributed to a number of factors:

- The continuing role of the USD as the primary international reserve currency.
- The USD financial markets offer a wide range of instruments and liquid markets in which large transactions can be readily accomplished.
- A large proportion of countries' exports and imports are denominated in USD.
- USD-denominated debt forms a major proportion of most countries' external debt.
- The USD is used almost exclusively in spot and in forward transactions between the CB and the banks authorised to deal in foreign exchange.

3.10 Development of the debt market

Excluding derivatives (which do not represent borrowing and lending, but hedging), there are two financial markets: share market and debt market. The debt market is comprised of the:

- *Short-term debt market* (STDM), made up of ST marketable debt (ST-MD) and ST non-marketable debt (ST-NMD). This entire market is referred to as the *money market (*definitions do differ in this respect; we prefer this definition because price discovery takes place in the entire STDM.
- *Long-term debt market* (LTDM), made up LT marketable debt (LT-MD) and LT non-marketable debt (LT-NMD). The bond market is the LT-MD market, and it is isolated because price discovery primarily takes place in this market.

Central banks have an interest in all financial markets because this is where borrowing and lending takes place (we regard shares as evidences of LT and perpetual borrowing) and where money is created. However, the CB has a special interest in the debt market, because this is the market in which it operates, and the stability of which is an integral part of financial stability (in which central banks have a major input).

In developing countries, borrowing and lending starts with the banks. Initially the entire financial market is a ST-NMD market via the banks. The first ST-MD instrument to appear is the treasury bill, a debt obligation of government, usually followed by the central bank security (which we call CB bills). The latter are issued for the purpose of monetary policy and the backdrop to it is usually surplus liquidity created by the sale of donor funds (forex) by government to the central bank. Balance Sheets 22–25 show the steps to the creation of excess liquidity (ER) (r = 10%).

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BALANCE SHEET 22: GOVERNMENT (LCC BILLIONS)			
Assets		**Liabilities**	
Deposit at foreign bank (1) Deposit at foreign bank (2) Deposit at central bank (3) Deposit at central bank (4) Goods (5)	+100 -100 +100 -100 +100	Donation (1)	+100
Total	+100	Total	+100

BALANCE SHEET 23: CENTRAL BANK (LCC BILLIONS)			
Assets		**Liabilities**	
Deposit at foreign bank (3)	+100	Government deposit (3) Government deposit (4) Reserve accounts (TR) (5) (RR = +10) (ER = +90)	+100 -100 +100
Total	+100	Total	+100

BALANCE SHEET 24: BANK A (LCC BILLIONS)			
Assets		**Liabilities**	
Reserve accounts (TR) (5) (RR = +10) (ER = +90)	+100	Deposits (NBPS) (5)	+100
Total	+100	Total	+100

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BALANCE SHEET 25: NPBS (LCC BILLIONS)			
Assets		Liabilities	
Goods (5) Deposits at bank (5)	-100 +100		
Total	0	Total	0

Assuming the banks were "balanced" at the outset (had no ER and no BR), they now have ER of LCC 90 billion (LCC10 billion was absorbed into RR). Interest rates will fall sharply and the CB can only prevent this by issuing CB bills. This is shown in Balance Sheets 26–27.

BALANCE SHEET 26: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
		CB bills Reserve accounts (TR) (RR = +10) (ER = 0)	+90 +10
Total	+100	Total	+100

BALANCE SHEET 27: BANK A (LCC BILLIONS)			
Assets		Liabilities	
CB bills Reserve accounts (TR) (RR = 0) (ER = -90)	+90 -90		
Total	0	Total	0

To make this exercise more apparent, Balance Sheets 29–29 are presented – to illustrate the net effect. The expansionary effect of the donation has been neutralised.

BALANCE SHEET 28: CENTRAL BANK (LCC BILLIONS)			
Assets		Liabilities	
Deposit at foreign bank	+100	CB bills Reserve accounts (TR) (RR = +10) (ER = 0)	+90 +10
Total	+100	Total	+100

BALANCE SHEET 29: BANK A (LCC BILLIONS)			
Assets		Liabilities	
CB bills Reserve accounts (TR) (RR = +10) (ER = 0)	+90 +10	Deposits (NBPS)	+100
Total	+100	Total	+100

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In many developing countries an unusual intermediary, which has a history that goes back to the UK in the 17th century, was encouraged to enter the market: the *discount house*. They started off life as trade bill brokers and morphed into specialised banks, which took short-term deposits only from the banks (and other depositors in some cases), invested in STMD and made markets in these assets. The motivation is that it is not in banks' interest to make markets – because they thrive in inefficient markets in terms of wide margins. Discount houses are the bane of banks' lives because they successfully reduce bank margins through market making and education of the financial services sector. They also are instrumental in creating new assets in the form of CP, NCDs and bonds.

Countries that do not encourage discount houses endeavour to introduce a primary dealership method of issuing and market making – not always with success, because of the banks' reluctance to make markets.

After the development of the money market, there is usually impetus to develop the share market as a provider of long-term (preference shares) and perpetual (ordinary / common shares) capital. This follows because there is reluctance to invest in longer term bonds. The bond market is sometimes correctly initiated by the CB, in the form of creating and publishing a "pattern of rates" on government bonds. This is designed to stimulate interest from the banks and stockbroking community, and is often followed by the CB acting as a market maker in bonds, i.e. quoting buying (bid) and selling (offer) rates simultaneously on all exiting bonds.

This initiative stimulates activity in the market and leads to a secondary market made by the banks / stockbrokers. The corporate bond market follows because a risk-free yield curve is required as a benchmark. One of the principles of investments is that the return on government securities is the lowest rate acceptable because it delivers a risk-free rate (rfr), and that all other investments must deliver a return (called a required rate of return (rrr) equal to (rp = risk premium):

$$rrr = rfr + rp.$$

The obvious question is: why does a CB want active financial markets? The answer is straightforward:

- It needs to conduct open market operations (OMO) with the purpose influencing bank liquidity and it can only do so in liquid markets.
- Efficient price discovery, which is a product of liquid markets, is required so that interest rates can react immediately to changes in monetary policy stimuli.

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