

Chapter 24 - continuation

Money in Canada Today

Money in Canada consists of

- Currency: notes and coins held by households and businesses.
- Deposits of individuals and businesses at banks and other depository institutions

$$M = C + D$$

Official Measures of Money

The two main official measures of money in Canada are:

M1 consists of currency and checking deposits held by individuals and businesses.

M2 consists of M1 plus all other deposits — non-chequable deposits and fixed term deposits held by individuals and businesses.

A **depository institution** is a firm that takes deposits from households/firms and makes loans to other households/firms.

Types of Depository Institutions

- Chartered banks
- Credit unions and caisses populaires
- Trust and mortgage loan companies

A chartered bank puts the depositors' funds into four types of assets:

- Reserves: notes and coins in its vault or its deposit at the Bank of Canada
- Liquid assets: Canadian government Treasury bills and commercial bills
- Securities: longer-term Canadian government bonds and other bonds/securities
- Loans: commitments of fixed amounts of money for agreed-upon periods of time

TABLE 24.2 Chartered Banks: Sources and Uses of Funds

	\$ billions April 2014	Percentage of deposits
Total funds	2,243	151.7
Sources		
Deposits	1,479	100.0
Borrowing	532	36.0
Own capital	232	15.7
Uses		
Reserves	28	1.9
Liquid assets	83	5.6
Securities	340	23.0
Loans	1,792	121.2

Source of data: Statistics Canada, CANSIM Table 176-0011.

The Bank of Canada

- Sole issuer of bank notes
- Banker to the banks and government
- Lender of last resort

Balance Sheet

The Bank of Canada has two main assets:

- i. government securities
- ii. loans to depository institutions

Its liabilities are

- i. Bank of Canada notes
- ii. depository institution deposits

TABLE 24.3 The Sources and Uses of the Monetary Base

Sources (billions of dollars)		Uses (billions of dollars)	
Government of Canada securities	64.7	Notes	64.5
Loans to depository institutions	<u>0</u>	Reserves of depository institutions	<u>0.2</u>
Monetary base	<u>64.7</u>	Monetary base	<u>64.7</u>

Source of data: Statistics Canada. The data are for June 2014.

Monetary Base

- The liabilities of the Bank of Canada (plus coins issued by the Canadian Mint) form the monetary base.
- The monetary base is the sum of Bank of Canada notes & coins, and depository institution deposits at the Bank of Canada (i.e., Reserves of depository institutions).

Open market operation is the purchase or sale of government securities by the Bank of Canada from or to a chartered bank or the public.

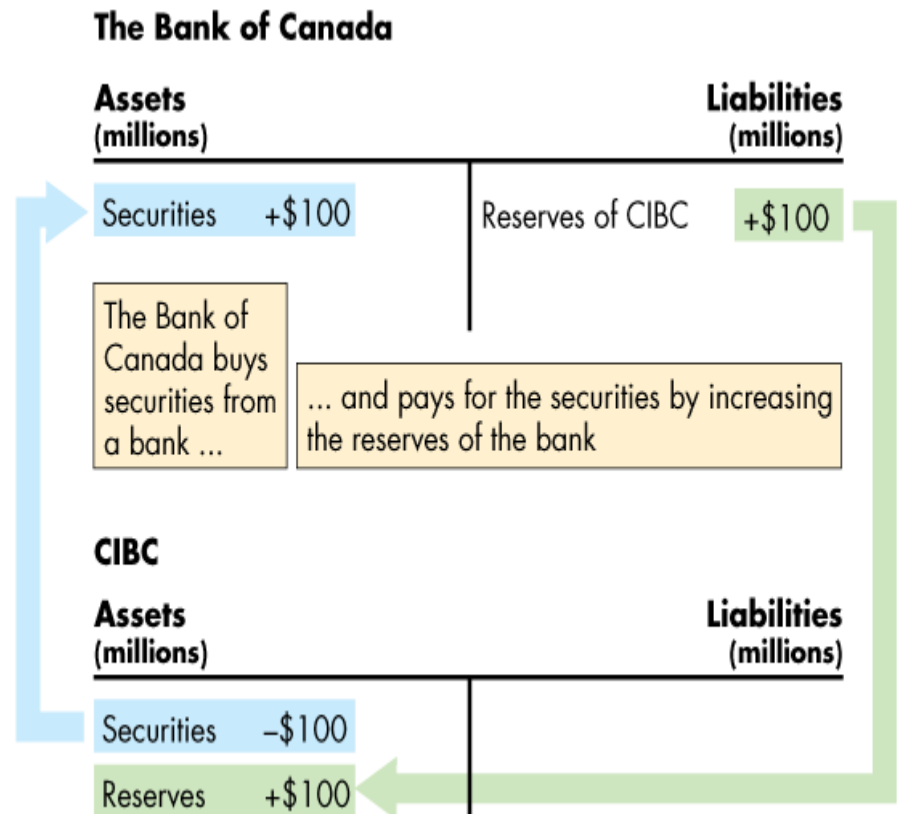
- When the Bank of Canada *buys* securities, it pays for them with newly created reserves held by the banks.
- When the Bank of Canada *sells* securities, they are paid for with reserves held by banks.

So open market operations influence banks' reserves.

An Open Market Purchase

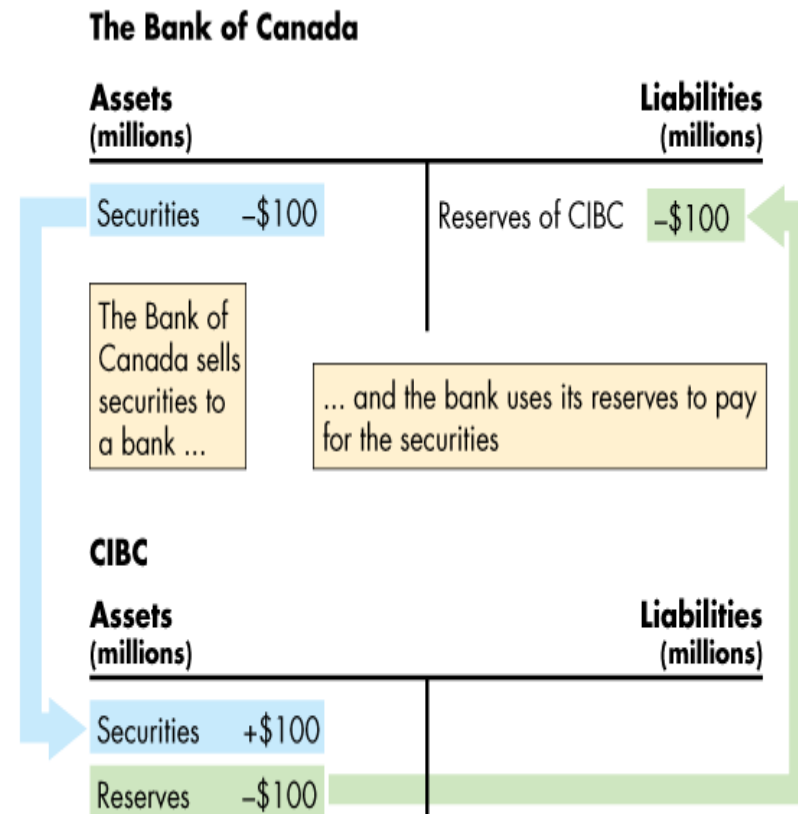
The effects of an open market *purchase* on the balance sheets of the Bank of Canada and CIBC.

The open market purchase increases bank reserves.



An Open Market Sale

The open market sale decreases bank reserves.



How (Chartered/Commercial) Banks Create Money

Recall:

$$\begin{array}{l} \text{Money} = \text{Currency} + \text{Deposits} \\ \text{M} = \text{C} + \text{D} \end{array}$$

Creating Deposits by Making Loans

- Banks create deposits when they make loans, and the new deposits created are new money.

The quantity of deposits that banks can create is limited by three factors:

- The monetary base
- Desired reserves
- Desired currency holding

The Monetary Base

The *monetary base* is the sum of BOC notes and coins, and banks' deposits at the BOC.

$$\mathbf{MB = C + R}$$

Desired Reserves

- A bank's desired reserves are the reserves (notes and coin in its vault and its deposits at the BOC) that it plans to hold.
 - A required reserves is the minimum quantity of reserves that a bank must hold (required by the central bank).

The **desired reserve ratio** is the ratio of the bank's reserves to total deposits that a bank *plans* to hold.

The desired reserve ratio exceeds the required reserve ratio by the amount that the bank determines to be prudent for its daily business.

Desired Currency Holding

People hold some fraction of their money as currency.

So when the total quantity of money increases, so does the quantity of currency that people plan to hold.

If bank deposits increase, desired currency holding also increases.

 Thus, when banks make loans that increase deposits, some currency leaves the banks.

This leakage of bank reserves into currency is called the *currency drain*.

The ratio of currency to deposits is the **currency drain ratio**.

The Money Creation Process and the Money Multiplier

- The money creation process begins with an increase in the monetary base.

Suppose that the BOC conducts an *open market operation* in which it buys securities from a bank (say, *Premier Bank*).

The BOC pays for the securities with newly created bank reserves.

Premier Bank now has more reserves (\$100) but the same amount of deposits, so they have excess reserves.

Instead of keeping the \$100 in their vault or deposit at the BOC, suppose that *Premier Bank* decided to loan all of it to an individual, and the individual in turn deposit the \$100 to *Bank A*.

*** Suppose that the *desired reserve ratio* is 0.10 and the *currency-deposit ratio* is 0 ***


Actual reserves = Desired reserves

Bank A will now find itself with a \$100 deposit. What to do with it?



- \$10 of which needs to be kept in reserve and \$90 can be loaned out.
- *Bank A* decided to loan the \$90 to another individual and the individual in turn deposit the \$90 to *Bank B*.

Bank B now has a \$90 deposit: need to keep \$9 in reserve and loan the remaining \$81.

<u>Bank</u>	<u>Increase in Deposits (\$)</u>	
Premier Bank	0.00	
Bank A	100.00	
Bank B	90.00	
Bank C	81.00	
.	.	
.	.	
.	.	
<hr/>	<hr/>	
Total for all banks	1000.00	

Let R/D = desired reserve ratio

$$M = \$100 + (1 - R/D)*\$100 + (1 - R/D)*(1 - R/D)*\$100 + (1 - R/D)*(1 - R/D)*(1 - R/D)*\$100 + \dots$$

$$= \$100 + (1 - R/D)* \$100 + (1 - R/D)^2 * \$100 + (1 - R/D)^3 * \$100 + \dots$$

$$= \$100 * [1 + (1 - R/D) + (1 - R/D)^2 + (1 - R/D)^3 + \dots]$$

$$= \$100 * [1 / R/D]$$

Define

money as the sum of currency and chequable deposits:

$$M = C + D$$

monetary base as the sum of currency and reserves:

$$MB = C + R$$

Take the ratio: $M / MB = (C + D) / (C + R)$

Divide both numerator and denominator of the right-hand side by D :

$$M / MB = (C/D + 1) / (C/D + R/D)$$

where C/D is the **currency-deposit ratio** or currency drain ratio

R/D is **reserve-deposit ratio** or desired reserve ratio


Therefore, $M = MB * [(C/D + 1) / (C/D + R/D)]$

The money multiplier m is $(C/D + 1) / (C/D + R/D)$.

The **money multiplier** is the ratio of the **change in** the **quantity of money** to the **change in** the **monetary base**.

For example, if the BOC increases the monetary base by \$100,000 and the quantity of money increases by \$250,000, the money multiplier is 2.5.

In general,

the quantity of money created depends on the desired reserve ratio **and** the currency drain ratio. 

The **smaller these ratios**, the **larger** is **the money multiplier**.