

Learning Objectives

1. Explain the various functions of money, and how money has evolved over time.
2. Show that modern banking systems include both privately owned commercial banks and government-owned central banks.
3. Explain how commercial banks create money through the process of taking deposits and making loans.
4. List what is included in the various measures of the money supply.

1 The Nature of Money

What Is Money?

Money is a medium of exchange — it is generally acceptable as payment for goods and services.

If there were no money, goods would have to be directly exchanged for each other — a system of barter.

But barter is very inefficient because of the double coincidence of wants — this is not a problem when a general medium of exchange is used.

Money is also used as a store of value. Unless there is very high inflation, money retains its value well. Alternative media of exchange — ice cream? — do not necessarily hold their value well.

Finally, money is used as a unit of account. It is the unit of measure we use to keep our financial accounts.

The Origins of Money

Money has evolved over time, taking various different forms:

- Metallic money: unlike today's coinage, the market value of the metal was equal to the face value of the coin.

This valuation led to debasement, and consequently to Gresham's Law, which predicts that when two types of money are used side by side, the one with the greater intrinsic value will be driven out of circulation.

- Paper money: paper money was backed by precious metal and was convertible on demand. It was often referred to as bank notes because it was issued by commercial banks.

- Fractionally backed paper money: once goldsmiths and banks discovered they did not need to keep one ounce of gold in their vaults for every claim on one ounce, they began to issue more money redeemable in gold than the amount they held in their vaults.
- Fiat money: paper money or coinage that is neither backed by nor convertible into anything else, but is decreed by the government to be acceptable as legal tender.

Today, almost all currency is fiat money.

Modern Money: Deposit Money

Money held by the public in the form of deposits with commercial banks and other financial institutions is called deposit money.

Bank deposits are money. Today, just as in the past, banks create money by issuing more promises to pay (deposits) than they have cash reserves available to pay out.

2 The Canadian Banking System

Most banking systems are made up of a central bank plus many commercial banks.

A central bank acts as a bank to the commercial banking system. It is usually a government-owned institution and is the sole money-issuing authority.

The Bank of Canada

The system of joint responsibility keeps the conduct of monetary policy free from day-to-day political influence but ensures that it is ultimately answerable to Parliament.

The basic functions of the Bank of Canada are to:

- act as banker to the commercial banks,
- act as banker to the federal government,
- regulate the money supply, and
- regulate, support, and monitor financial markets.

Assets and Liabilities of the Bank of Canada, December 2002 (Millions of Dollars)

Assets		Liabilities	
Government of Canada Securities	40 333	Notes in circulation	41 146
Advances to banks	535	Government deposits	534
Foreign-currency assets	679	Deposits of banks (reserves)	1 191
Other assets	2 412	Foreign-currency liabilities and capital	516
		Other liabilities and capital	570
Total (\$millions)	43 958	Total (\$ millions)	43 958

Source: Bank of Canada Annual Report, 2002.

Commercial Banks in Canada

A commercial bank is a privately owned, profit-seeking institution that provides a variety of financial services, such as accepting deposits and making loans.

Consolidated Balance Sheet of Canadian Chartered Banks, Feb 2003

Assets		Liabilities	
Reserves	3 622	Demand deposits	100 184
Government of Canada securities	95 583	Savings deposits	380 160
Mortgage and non-mortgage loans	706 985	Time deposits	176 042
Canadian securities	112 496	Government of Canada deposits	1 880
Foreign-currency assets	690 609	Foreign security-deposits	734 204
Other assets	152 979	Shareholder's equity	81 187
		Other liabilities	288 617
Total (\$ millions)	1 762 274	Total (\$ millions)	1 762 274

Source: Bank of Canada Review, Spring 2003, Table C3.

Reserves

The reserves needed to assure that depositors can withdraw their deposits on demand are normally quite small because only a small fraction of depositors want their money at any time.

A bank's reserve ratio is the fraction of its deposit liabilities that it actually holds as reserves, either as vault cash or as deposits with the central bank.

A bank's target reserve ratio is the fraction of its deposits it wishes to hold as reserves.

Commercial banks strive to maintain some target ratio of reserves to deposits. In the past, this target ratio was legally imposed; today, it is determined by the banks themselves.

The Canadian banking system is a fractional-reserve system, with commercial banks holding reserves of much less than 100 percent of their deposits.

Any reserves in excess of target reserves are called excess reserves.

How much do banks actually hold in reserve?

In the previous table, Canadian chartered banks are seen to be holding \$3.6 billion of reserves when their deposits are over \$650 billion. Not that much!

3 Money Creation by the Banking System

Some Simplifying Assumptions

To simplify things, suppose that banks can invest in only one kind of asset — loans — and there is only one kind of deposit — a demand deposit.

Two other simplifying assumptions are:

- a fixed target reserve ratio, and
- no cash drain from the banking system.

The Creation of Deposit Money

The bank initially has a reserve ratio of 20 percent — that is, the ratio of reserves to deposits is 0.20.

Assets		Liabilities	
Cash and other reserves	200	Deposits	1000
Loans	900	Capital	100
	<u>1100</u>		<u>1100</u>

Assets		Liabilities	
Cash and other reserves	300	Deposits	1100
Loans	900	Capital	100
	<u>1200</u>		<u>1200</u>

A single new deposit of \$100 raises liabilities and assets by the same amount, and the bank's reserve ratio initially increases to 27 percent.

The bank can now lend the excess reserves of \$80 — it will then return to its 20 percent reserve ratio.

Assets		Liabilities	
Cash and other reserves	220	Deposits	1100
Loans	<u>980</u>	Capital	<u>100</u>
	1200		1200

The \$80 in new loans results in a second bank receiving new deposits of \$80. This is the second round of new deposits.

Assets		Liabilities	
Cash and other reserves	+16	Deposits	+80
Loans	<u>+64</u>	Capital	<u>+0</u>
	+80		80

The second-round bank receives cash deposits and expands its loans by \$64, or 80 percent of the new deposits.

Bank	New Deposits	New Loans	Addition to Reserves
1 st - round bank	100.00	80.00	20.00
2 nd - round bank	80.00	64.00	16.00
3 rd - round bank	64.00	51.20	12.80
4 th - round bank	51.20	40.96	10.24
5 th - round bank	40.96	32.77	8.19
6 th - round bank	32.77	26.22	6.55
Total for 6 rounds	368.93	295.15	73.78
All remaining rounds	131.07	104.85	16.22
Total for the banking system	500.00	400.00	100.00

A single new deposit begins a long sequence of deposit creation. In this example, with the target reserve ratio of 20 percent, the new deposit of \$100 creates a total expansion of deposits equal to \$500.

If v is the target reserve ratio, the ultimate expansion of deposits in the banking system will be $1/v$ times the new deposit.

With no cash drain from the banking system, a banking system with a target reserve ratio of v will change its deposits by $1/v$ times any change in reserves.

$$\Delta \text{Deposit} = \frac{\Delta \text{Reserves}}{v}$$

Excess Reserves and Cash Drains

Deposit creation does not happen automatically; it depends on the decisions of bankers. If bankers do not lend out their excess reserves, deposits will not expand.

If households keep a fixed fraction of their deposits in cash — a cash drain — the deposit-creation process will be dampened.

If c is the ratio of cash to deposits that people want to maintain, the final change in deposits will be given by:

$$\Delta \text{Deposits} = \frac{\Delta \text{Reserves}}{c + v}$$

4 The Money Supply

The money supply is the total quantity of money that is in the economy at any time. Various definitions of money include various types of deposits.

Kinds of Deposits

The long-standing distinction between money and other highly liquid assets used to be that money was a medium of exchange that did not earn interest, whereas other assets earned interest but were not a media of exchange.

Today this distinction is almost completely inaccurate.

Definitions of the Money Supply

- The most narrow definition of money is M1. M1 is currency, plus demand deposits, plus other chequable deposits.
- A broader definition is M2. M2 is M1 plus saving deposits at the chartered banks.
- A still broader measure is M2+. M2+ is M2 plus deposits held at institutions that are not chartered banks.

Near Money and Money Substitutes

Assets that are a store of value and are readily converted into a medium of exchange but are not themselves a medium of exchange are called near money.

In general, whether it pays to convert cash or chequable deposits into higher interest-earning term deposits for a given period will depend on the inconvenience and other transaction costs of shifting funds, and on the amount of interest that can be earned.

Things that serve as a temporary medium of exchange but not a store of value are sometimes called money substitutes.

Choosing a Measure

There is no single timeless definition of money, or what qualifies as near money or a money substitute.

New financial assets are continually being developed that serve some, if not all, of the functions of money.

The Role of the Bank of Canada

The commercial banking system, when confronted with a new deposit, can create a multiple expansion of bank deposits. This expansion shows how the reserves of the banking system are related to the money supply.

It is the Bank of Canada's job to control those reserves.