Chapter 27

Money and Banking

Two Perspectives on Money

The Classical View of Money

- Relative prices and real GDP determined only by real things
    - technology and preferences

- Money is **neutral**
    - change in the money supply causes **no change** in **real** variables

- change in the money supply does lead to a **proportionate change** in the **price level**

The Modern View

Short run:

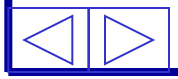
• changes in money **do** generate changes in output and other real variables

Long run:

• money **is neutral**

- changes in money and the price level are closely linked

countries with high inflation rates often have higher rates of growth of the money supply



The Nature of Money

Money is a **medium of exchange**

- acceptable as payment for goods and services.

- without money, would need a system of **barter**
  - barter is inefficient
  - requires **double coincidence of wants**

Not a problem when a general medium of exchange is used.

Money is a **store of value**

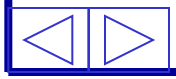
• without high inflation, money retains its value

Alternative media of exchange -- ice cream?

-- do not necessarily hold their value well.

Money is a **unit of account**

• the unit of measure we use to keep our financial accounts



The Origins of Money

Metallic money

- Coin worth market value of metal
- Led to **debasing**

Gresham's Law:

- "bad money drives out good"

when two types of money used

- one with greater intrinsic value will be driven out of circulation

Paper money

- backed by precious metal
- convertible on demand
- referred to as **bank notes**
  because it was issued by private banks

Fractionally backed paper money

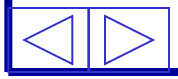
• goldsmiths (banks) found they didn't need to keep 1 oz. of gold in vaults for every receipt for 1 oz.

• issued more "receipts" than the gold in their vaults

Fiat money

• paper money or coinage
• neither backed by nor convertible into anything else
• decreed by the government to be acceptable as **legal tender**

Today most currency is fiat money.



Modern Money

Deposit Money:

• money held by the public in form of deposits with commercial banks and other financial institutions

• bank deposits are money

Money Creation:

• banks create money by issuing more promises to pay (deposits) than they have available in their cash reserves

The Canadian Banking System

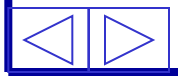
Consists of:

- commercial banks
- a central bank

Central bank:

- acts as a bank to commercial banking system
- usually government-owned
- sole money-issuing authority

Bank of Canada [**BOC**] is central bank in Canada



BOC

- operates under system of **joint responsibility - 1967**
  - operates monetary policy on a day-to-day basis
  - free of political influence
  - ultimately answerable to Parliament

Basic functions of BOC:

1) banker to commercial banks

2) banker to federal government

3) regulate money supply

4) regulate, support, and monitor financial markets

1) Banker to commercial banks:

- Accepts deposits (commercial bank reserves)
- Transfers funds to other commercial banks to settle debts
- Lends to commercial banks (lender of last resort)

Assets (March, 1999)		**Liabilities (March,1999)**	
Government of Canada Securities	30,042	Notes in circulation	30,882
Advances to banks	737	Government deposits	12
Foreign-currency assets	323	Deposits of banks (reserves)	1,115
Other assets	1,696	Foreign-currency liabilities and capital	159
		Other liabilities and capital	630
Total ($millions)	**32,798**	**Total ($ millions)**	**32,798**

2) Banker to Federal Government

- Holds some government deposits

- May lend to federal government by buying treasury bills (short term bonds) or regular bonds

Important for conduct of monetary policy

3) Regulator of Money Supply

- Controls money supply
- Two main **liabilities** of **BOC** are:
    - Currency in circulation
    - Chartered bank reserves

- Controlling liabilities, controls money supply

4) Regulate and Support Money Markets

- Financial institutions
  - banks, borrow short and lend long

Problems:

- unexpected interest rate rise
  - banks must pay higher interest rates to keep deposits
  - funds loaned out a lower rates

BOC can adjust interest rates to prevent these problems.

These 4 functions may conflict with each other.

Commercial Banks in Canada

- privately owned
- profit-seeking institution
- provide a variety of financial services
    - accepting deposits
    - making loans, etc.

Bank Act

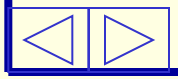
- provides for commercial banks
- other financial institutions
    - credit unions, trust companies, caisses populaires in Quebec, etc.

Interbank Activities:

banks cooperate with each other in some areas:

- “Pool” very large loans
- Credit cards operated by groups of banks
- banks operate **clearing house**
  - settle interbank debts each day
  - transfer funds to settle cheques

  At end of day
  - if bank A owes bank B money
    - transfers money from its account at BOC



Combined balance sheet of commercial banks:

Assets (Feb. 1999)		**Liabilities**	
Reserves	3 865	Demand deposits	56 310
Government of Canada securities	74 673	Savings deposits	292 499
Mortgage and nonmortgage loans	536 439	Time deposits	131 165
Canadian securities	66 462	Government of Canada deposits	5 976
Foreign-currency assets	612 931	Foreign security-deposits	636 120
Other assets	95 141	Shareholder's equity	61 238
		Other liabilities	206 203
Total ($ millions)	**1 398 511**	**Total ($ millions)**	**1 389 511**

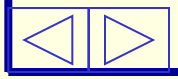
Reserves

Money in Demand Deposits at bank

- bank keeps part of deposit
- lends out the rest

Reserves:

- portion of loan (new deposit in next bank) that is kept
  - normally quite small
  - only a small fraction of depositors want their money at any time
- needed to assure depositors can withdraw deposits on demand



bank's **reserve ratio:**

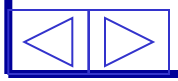
- fraction of deposits it **actually** holds as reserves

Reserves held as:

- vault cash
- deposits with central bank

bank's **target reserve ratio:**

- fraction of its deposits it wants to hold as reserves
- target ratio was legally imposed until early 1992
- now determined by the bank itself



Canadian banking system:

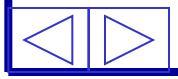
Fractional-reserve system

- banks reserves approx. 3%

    - panic rush to withdraw funds
    - banks run out of reserves
    - banks borrow reserves from BOC

Excess reserves:

- Any reserves in excess of target reserves
- Excess reserves are loaned out

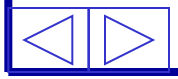


Money Creation by Banking System

Assumptions:

- banks can invest in only one kind of asset -- loans
- only one kind of deposit -- a demand deposit

    - fixed target reserve ratio
    - no cash drain from banking system



The Creation of Deposit Money

- reserve ratio (v) of 20% = 20 / 100 = 0.2
- ratio of reserves to deposits [R/D] = v = 0.2

Assets		Liabilities	
Cash and other reserves	200	Deposits	1000
Loans	900	Capital	100
	1100		1100

New deposit of $100

• raises liabilities and assets [immediate reserves] by the same amount

• bank's reserve ratio initially increases to 27%:

Assets		Liabilities	
Cash and other reserves	300	Deposits	1100
Loans	900	Capital	100
	1200		1200

- target reserves now [0.2 * 1100] = 220
- 1200 – 220 = 980
- bank now lends the excess reserves of $80 = [980 - 900]
- bank returns to its 20% reserve ratio

Assets		Liabilities	
Cash and other reserves	220	Deposits	1100
Loans	980	Capital	100
	1200		1200

- $80 in new loans in first bank

Second bank receiving:

- new deposits of $80 [= Δ D]
- target reserves of $16 [.2 * 80 = 16]
- excess reserves of (expands its loans by) $64
  [80 – 16 = $64]

Assets		Liabilities	
Cash and other reserves	+16	Deposits	+80
Loans	+64	Capital	+0
	+80		+80

A single new deposit begins sequence of deposits creation.

In this example:

- target reserve ratio is 20%
- new deposit of $100

- Deposit Multiplier: $DM = \frac{1}{V} = \frac{1}{0.2} = 5$
- creates a total expansion of deposits equal to $500

[5 * +100 = +500]

DM * Δ D = Total ΔD or ΔMS

or, ΔR

Bank	New Deposits	New Loans	Addition to Reserves
1st - round bank	100.00	80.00	20.00
2nd - round bank	80.00	64.00	16.00
3rd - round bank	64.00	51.20	12.80
	.	.	.
	.	.	.
	.	.	.
	.	.	.
	.	.	.
	.	.	.
Total for the banking system	500.00	400.00	100.00
	[5 * 100]	[5 * 80]	[5 * 20]

- *v* is the target reserve ratio
- no cash drain
- banking system will change its deposits by 1/*v* times any change in reserves

$$\Delta Deposit = \frac{\Delta \,\mathrm{Re}\, serves}{v}$$

In last example:

- ***V*** (target reserve ratio was 20%)
- new deposit was $100
- final increase in deposits was

$$+\$100 \times \frac{1}{v} = +\$100 \times \frac{1}{0.2} = +\$100 \times 5$$

$$= +\$500 \uparrow$$

- deposit creation does not happen automatically
- if banks do not lend excess reserves
- deposits do not expand

Excess Reserves and Cash Drains

Cash drain:

- households keep a fixed **fraction** of their funds in cash
- deposit-creation process dampened
- If ***c*** is the **ratio of cash to deposits** [**C/D**]that people want to maintain
- final change in deposits given by:

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

- if ***V*** = 20%
- ***C*** = 10%
- household deposits an additional $100
- deposits (money) will change by:

$$\frac{\$100}{0.10+0.20} = \frac{\$100}{0.30} \quad = \ + \$333 \uparrow$$

- a new bank deposit of $100 increases total bank deposits by $333

Less than case with NO cash drain [$500]

bank 1

- receives $100 deposit
- keeps $20 (20% of $100) in reserves
- lends out $80

Borrower

- keeps $8 (10% of $80) in cash
- deposits $72 in **bank 2**

bank 2

- keeps $14.40 (20% of $72) in reserves
- lends out $57.60 . . . .

End result:

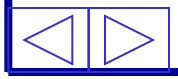
- deposits are up by $333

The Money Supply

- total quantity of money in economy at any time
- consists of **currency** plus various types of **deposits**

Kinds of Deposits

- various definitions of the money supply
  - depending on types of deposits included



Definitions of the Money Supply

Narrow definition:

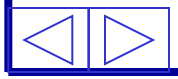
M1 = currency plus demand (chequable) deposits

Broader definition:

M2 = M1 plus saving deposits at the commercial banks

Still broader measure:

M2+ = M2 plus deposits at institutions that are **not** commercial banks, e.g. credit unions, trust companies

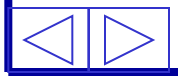


Near Money and Money Substitutes

Near money :

- assets that are a store of value
- readily converted into a medium of exchange (money)
- not themselves money

    - term deposit
        - good store of value (earns interest)
        - poor medium of exchange



Money substitutes :

- serve as a temporary medium of exchange
- not a store of value
- e.g. credit card

Choice between keeping money or chequing accounts

- depend on need for convenience vs. interest earnings

Choosing a Measure

- no perfect definition of money, near money or a money substitute
- New financial assets are continually being developed
    - serve some or all functions of money

The Role of the Bank of Canada

- commercial banking system can create a multiple expansion of bank deposits when it receives a new deposit
- shows that the money supply is related to the reserves of the banking system
- control reserves