

# Money and the macro-economy

## Macroeconomic Policy API 5125

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Lecture 6



# Objectives for this block of classes

as listed in the course outline

- 1 Business cycles
- 2 Spending and output in the short run
- 3 Money and monetary policy
- 4 Fiscal policy
- 5 The “open” economy

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## *Today's class*

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- 1 Central Banking, Commercial Banking, and Money
- 2 Monetary Policy and the role of the Central Bank



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# Objectives

Monetary policy is about the Bank of Canada using its control over interest rates to influence aggregate spending

- the Central Bank also has other instruments it can use
- ① The nature of money and its uses
  - ② Commercial banks and the creation of money
  - ③ Responsibilities of the Central Bank
  - ④ Modeling the money supply

Money: its evolution, uses, and measurement

# Evolution of Money

money is an asset that can be used as a means of payment for purchases and for settling debts

## Commodity money

- commodities that have intrinsic value (and that are storable, easy transported, and difficult to counterfeit) have been used as “money”

## Fiat money

- no, or very little, intrinsic value
- valuable because of a social consensus that makes it accepted by all as a means of payment
- “money’s destiny is to be digital” reflects something called “Gresham’s Law”

Money: its evolution, uses, and measurement

# Money and its uses

money is used because it plays three inter-related economic functions

- 1 A medium of exchange
  - avoids barter and the “coincidence of wants”, thereby allowing specialization in production
  - this is one motive for holding money (even if no interest is paid)

Money: its evolution, uses, and measurement

# Money and its uses

money is used because it plays three inter-related functions

- 1 A medium of exchange
- 2 A unit of account
  - a measuring rod for economic values
  - a common unit of account permits comparisons between commodities

Money: its evolution, uses, and measurement

# Money and its uses

money is used because it plays three inter-related functions

- 1 A medium of exchange
  - 2 A unit of account
  - 3 A store of value
- a way to hold wealth
  - there are other ways, but money must also do this if it is to be a “medium of exchange”



Money: its evolution, uses, and measurement

# Measuring the amount of money

just what is money is open-ended, but very specific definitions are used to quantify some dimensions

M1 is a very narrow definition of the money stock

- the sum of currency outside of banks, and the balances held in demand deposits

M2 is a broader definition

- currency outside of banks, personal deposits, non-personal demand and notice deposits
- currency is actually as small part of M2
- M2 in 2010 was \$1,013 billion: currency was \$56 billion; non-personal deposits were \$290 billion; and personal deposits were \$666 billion

# What determines the amount of money in an economy?

## 100% reserve banking

Money is not just currency, but also deposits in commercial banks. So the determination of the money supply depends on the behaviour of financial intermediaries and depositors.

- imagine an economy with only currency
- there is a demand for safekeeping, and cheques evolve as a transfer device
- currency need not leave the bank, which charges no interest but just a fee for safekeeping
- “bank reserves” refers to the assets held by the bank
- “100% reserve banking” requires bank reserves to equal deposits
- reserves are not counted as part of the money supply, but deposits are because they circulate

# What determines the amount of money in an economy?

## fractional reserve banking and the creation of money

Money is not just currency, but also deposits in commercial banks. So the determination of the money supply depends on the behaviour of financial intermediaries and depositors.

- only a portion of reserves are needed to meet the demand for cash, since it is not circulating the rest of the reserves can be used to make loans that earn an interest
- once loans are made, reserves do not equal deposits
- “fractional reserve” systems are those with fewer reserves than deposits, the reserve-deposit ratio is less than 100
- loans are now part of bank assets and these are deposited and become part of liabilities, the money supply has increased because of commercial banking
- banks have a desired reserve-deposit ratio which equals bank reserves ÷ bank deposits
- deposits expand through successive rounds of lending as long as the ratio of reserves to deposits exceeds the desired ratio

$$\bullet \text{ Bank deposits} = \frac{\text{bank reserves}}{\text{desired reserve:deposit ratio}}$$

# What determines the amount of money in an economy?

## fractional reserve banking and the destruction of money

Money is not just currency, but also deposits in commercial banks. So the determination of the money supply depends on the behaviour of financial intermediaries and depositors.

- an increased desire to hold currency will reduce the money supply in a fractional reserve system
- a “bank run”, or a “run”
  - a self-fulfilling prophecy in which a rush to hold currency because of fears of a bank bankruptcy leads to the bankruptcy
  - it takes time for a bank to call in its loans, and a large simultaneous demand from depositors cannot be instantly met
- “bank panic” is widespread, a “run on the banks”
  - it can produce a contraction of the money supply
  - which then leads to limits in borrowing and overall spending

# The “Central” Bank

is not a commercial enterprise

Central Banks, like the Bank of Canada, have three major responsibilities

- 1 Issue Bank notes, which are a major component of currency
- 2 Maintain stability of the financial system as a “lender of last resort”
- 3 Conduct “monetary policy”
  - key policy rate or “overnight” rate
  - quantitative easing, the creation of central bank reserves for the purchase of financial assets
  - credit easing, the purchase of private sector assets to reduce interest rate spreads

# How the Central Bank can change bank reserves

## 1. Open market operations

The buying and selling of financial assets that increase or decrease bank reserves

- the purchase of short term government bonds (an “open market purchase”) is done with newly printed money that is deposited in commercial banks, thereby boosting their reserves
- “open market sale” has the opposite effect on reserves and the money supply, which flows back to the Central Bank and is retired

# How the Central Bank can change bank reserves

## 2. Changes in reserve requirements

An increase in the reserve-deposit ratio lowers the money supply as banks lend out a smaller share of deposits

- “reserve requirements’ are legally required values of the reserve-deposit ratio
- $Money\ supply = currency + \frac{bank\ reserves}{desired\ reserve:deposit\ ratio}$
- note that lowering requirements below the desired level will not have an impact

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# How the Central Bank can change bank reserves

## 3. Government deposit shifting

The government has deposits at both the central bank and the commercial banks

- commercial bank reserves can be changed by shifting government deposits between them and the central bank

# The importance of the money supply for macroeconomics

economic models incorporate a financial sector in order to understand the impact of money on the macro-economy

Money will impact the macroeconomy in different ways depending upon how it is modeled. Understanding inflation and hyperinflation in the classical model is an example that we have already talked about. This relied on the “quantity equation”, and was based upon the understanding of money as a medium of exchange

- The Quantity equation

- $M \times V = P \times Y$ , where  $M$  is the quantity of money,  $V$  is the velocity of money;  $P$  is the price level
- $P \times Y$  is nominal GDP

- The velocity of money is its rate of circulation, “the speed at which money changes hands” or the number of transactions a unit of money undertakes

- it depends upon which definition of the money supply is used
- $V = (P \times Y) / M$ , the broader the definition of money supply, the smaller the velocity

- if  $V$  and  $Y$  are constant, then changes in the money supply will be reflected in changes in prices

-  Robert H. Frank, Ben S. Bernanke, Lars Osberg, Melvin Cross, Brian MacLean  
*Principles of Macroeconomics. 4th Canadian Edition.*  
Toronto: McGraw-Hill Ryerson, 2012. Chapters 9 and 10.
-  Tim Harford  
*The Undercover Economist strikes back: How to Run or Ruin an Economy*  
New York: Riverhead Books, Penguin, 2013. Chapter 5.