

# ESC3701 Monetary Economics III

## Part 1

### Chapter 1: Why study money, banking and financial markets.

- A security or financial instrument is a claim on the issuer's future income or assets (which is any financial claim or piece of property that is subject to ownership).
- A bond is a debt security that promises to make payments periodically for a specified period of time.
- An interest rate is the cost of borrowing or the price paid for the rental of funds.
- Financial Crises is a major disruption in the financial markets characterised by a sharp decline in asset prices and the failure of many financial and non-financial firms.
- GDP (aggregate output) is the market value of all final goods and services produced in a country during the course of the year, which excludes purchase of goods that have been produced in the past and excludes purchase of stocks or bonds. Intermediate goods are not counted.
- Aggregate income is the total income of factors of production from producing goods and services per country per year. **GDP = Aggregate Income.**
- When GDP is calculate with current prices it is called nominal GDP.
- GDP measured with constant prices is referred to as real GDP. Therefore values only change if actual production changed.
- 3 Aggregate price levels, expressed as price index against base year 100.

$$1) \text{ GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}}$$

$$2) \text{ PCE deflator} = \frac{\text{nominal personal consumption expenditures}}{\text{real personal consumption expenditures}}$$

3) Consumer Price Index measured by pricing a basket of goods and services brought by a typical urban household.

- To convert nominal to real divide by price index. Annualised basis is a basis converted to a year.

### Meaning of a security and how it facilitates direct lending and borrowing

- A security or financial instrument is a claim on the issuer's future income or assets.
- To facilitate direct lending securities are sold in financial markets where the lender-savers channel funds to the borrower-spenders.
- Common securities include bonds or stocks.
- Securities are assets to the lender-savers and liabilities to the borrower-spenders.
- Securities facilitate moving funds from people with an excess to the people who have profitable opportunities.
- SA the major instrument of monetary policy is the control of an interest rate called the repo rate. → SARB – sets the repo rate.
- The repo rate in South Africa is the equivalent of the federal funds rate in the USA.
- The repo rate is a short-term interest rate which represents an interest rate paid by commercial banks to the SARB to obtain reserve funding (i.e. borrowing money from the SARB), yet it impacts on all interest rates in the economy. Thus changes in the repo rate impact the economy at large.

## Common stock, its purpose and how it affects business investment decisions.

- A common stock represents a share of ownership in a company.
- It is a security, and is a claim on the earnings and assets of the corporation.
- Selling stock is way to raise funds for financing the companies activities.
- It affects business decisions as higher stocks prices in the stock market mean that the company will be able to raise more finance through selling stock at higher prices.

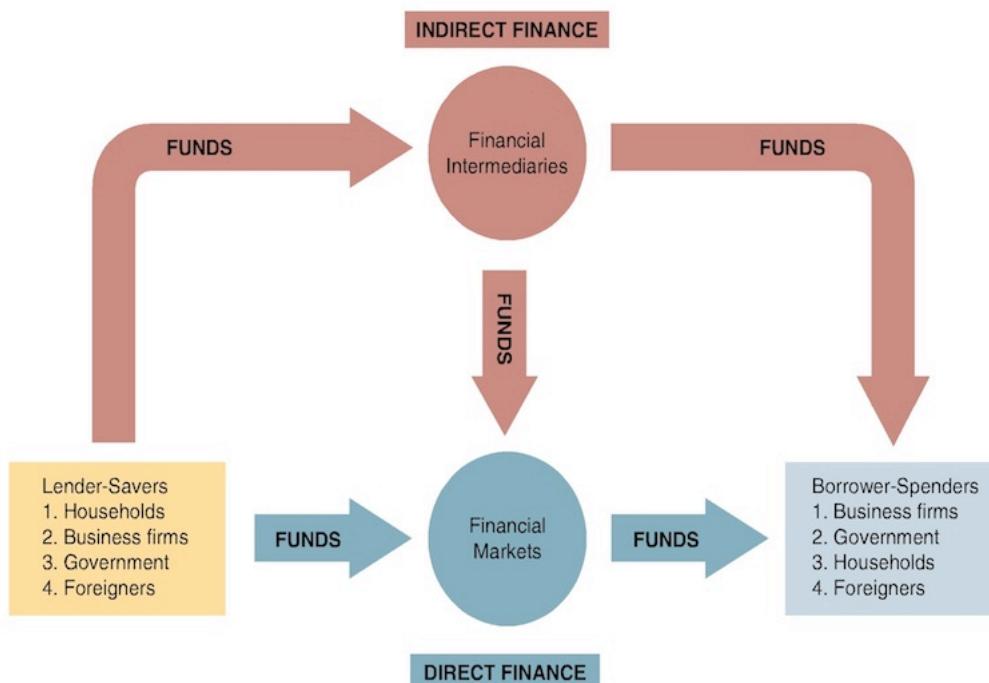
## List two ways in which the quantity of money may affect the economy

- 1) Through the aggregate price level
- 2) Through interest rates.

## Difference between nominal and real GDP and their uses

- Nominal GDP is when the total value of final goods and services is calculated using current prices.
  - Real GDP is calculated with constant prices, given at a base year.
- Nominal GDP can be misleading as an increase could be due to a rise in the price level or an actual increase in final good and services.
- An increase in Real GDP can only be from an increase in final goods and services and not an increase in prices.

## Chapter 2: Overview of financial system



- Direct finance: borrowers borrow funds directly from financial markets by selling securities
- Indirect finance: a financial intermediary borrows funds from lender-savers and then uses these funds to make loans to borrower-spenders.
- Financial markets are critical for producing an efficient allocation of capital which contributes to higher production and efficiency for the economy as a whole.
- Structure of financial markets
  - 1) Debt and Equity Markets
    - Short-term less than a year. 1-10 years are intermediate. > 10 is long-term

- Firms or individuals can obtain funds through issuing debt instruments (bonds/mortgage) or issue equities (stock)
- A disadvantage of equities is the holder is a residual claimant, the firm must pay debt holders first before its equity holders.
- A advantage to holding equities is the direct benefit of increased firm profits versus the fixed amounts of debt, because of ownership rights of equities.
- Brokers are agents of investors who match buyers with sellers, dealers link buyers and sellers by buying and selling at stated prices.
- 2) Primary and Secondary Markets
  - Primary market for initial issues of securities (Investment banks).
  - Secondary markets (JSE) make securities more liquid, also set benchmark prices for the primary market.
- 3) Exchange and OTC markets
  - Secondary markets.
  - Exchanges, central location where buyers and sellers of securities conduct trades
  - OTC dealers at different locations sell securities to anyone willing to pay their prices. Similarly competitive to exchanges due to technology.
- 4) Money and Capital Markets
  - Money market: short-term securities
  - Capital markets: 1 year or greater.<sup>1</sup>

## Financial market instruments

- Money market short-term debt instruments.
- 1) US Treasury Bills. Short-term, no interest payments, set payment at maturity, sold at a discount. Most liquid and safest. Mainly held by banks.
- 2) Negotiable Bank Certificates of Deposit: a certificate of deposit (CD) is a debt instrument sold by a bank to depositors that pays annual interest of a given amount and at maturity pays back the original price. Negotiable CD's are traded in secondary markets. Big source of funds for banks.
- 3) Commercial Paper is a short-term debt instrument issued by large banks and well-known corporations.
- 4) Repurchase agreements are effectively short-term loans less than 2 weeks for which Treasury bills serve as collateral. Big source of funds for banks. Issued mainly by corporations.
- 5) Federal Funds, overnight loans between banks using their deposits at the Federal reserve.
- Capital Market for longer term debt.(Riskier than money market)
  - 1) Stocks. Largest security in capital market, Held by households and institutions.
  - 2) Mortgages are loans to households or firms to purchase housing, land or real structures that serve as collateral. Largest debt market in US.
    - Mortgage back security is a bond like instrument backed by a bundle of individual mortgages whose interest and principle payments are collectively paid to the holder-of the security.
  - 3) Corporate Bonds. Issued by corporations with strong credit ratings. Convertible bonds can be changed into stock anytime up till maturity. Principle buyers are life insurance, pension funds households and other large holders. Not as liquid as government securities. Larger than new stock issues.
  - 4) US Government Securities. Most liquid security.
  - 5) US Government Agency Securities

- 6) State and Local Government Bonds (Municipal bonds). Issued by state and local governments for big projects, exempt for income tax. Banks largest holders.
- 7) Consumer and Bank Commercial Loans.

## Indirect finance and 4 financial intermediary functions

- The basic function of financial markets is to channel funds from savers who have excess funds to spenders who have a shortage of funds.
- Direct finance is when borrowers borrow funds directly from lenders by selling them securities
- The process of indirect finance using financial intermediaries is call financial intermediation.
- More important source of funds for corporations than securities markets.
- Financial intermediaries are financial institutions that acquire funds by issuing liabilities and, in turn use those funds to acquire assets by purchasing securities or making loans.
- Indirect finance involves an intermediary that stands between lenders and borrows and helps transfer funds from one to the other.

## Transaction Costs / Liquidity services

- Time and money spent in carrying out financial transactions.
- Intermediaries can reduce transaction because they benefit from economies of scale due to expertise and size.
- Intermediaries provide liquidity services that make it easier for customers to conduct transactions.  
e.g Checking accounts to pay bills.

## Risk sharing

- They sell less risky investment and then use the funds to purchase more risky investments.
- They earn profit on the difference between the returns on risky assets they bought and the payments made on assets they sold. Also called asset transformation.
- They help individuals to diversify and thereby lower the amount of risk through low costs and assets pooling.

## Asymmetric information

- One party does not know enough about the other party to make accurate decisions.
- Intermediaries are better equipped and can alleviate asymmetric information problems.
- Two forms
  - 1) Adverse selection
    - Occurs before the transaction
    - Potential borrowers who are the mostly like to produce an undesirable outcome are the ones who most actively seek out a loan and are thus most likely to be selected.
    - Results in fewer loans to all as lenders hesitate to lend at all.
  - 2) Moral hazard
    - Occurs after the transaction.
    - The risk that the borrower will engage in activities undesirable to the lender hence increase in chance of default.
    - Reduces loans for all due hesitation to lend.
    - If there were no asymmetric information there could still be a moral hazard problem because the lender knows there might be a default and reducing such risk is too costly, therefore still a moral hazard.

- Intermediaries are better equipped to screen out bad risk (reduce adverse selection) and monitor borrowers (reduce moral hazard)

## Economies of scope

- Lowering the cost of information production for each service by applying one information resource to many different services.
- Credit risk evaluation on corporation for loan and then sale of the corporation's bonds to the public.
- Creates conflict of interest (moral hazard problem) due to offering multiple services, and by information being concealed or misleading.

## Type of financial intermediates

Primary Assets and Liabilities of Financial Intermediaries		
Type of Intermediary	Primary Liabilities (Sources of Funds)	Primary Assets (Uses of Funds)
<b>Depository institutions (banks)</b>		
Commercial banks <b>largest and most diversified</b>	Deposits	Business and consumer loans, mortgages, U.S. government securities, and municipal bonds
<b>Thrift institutions</b>		
Savings and loan associations	Deposits	Mortgages
Mutual savings banks	Deposits	Mortgages
Credit unions	Deposits	Consumer loans
<b>Contractual savings institutions</b>		
Life insurance companies	Premiums from policies	Corporate bonds and mortgages
Fire and casualty insurance companies <b>more liquid assets</b>	Premiums from policies	Municipal bonds, corporate bonds and stock, and U.S. government securities
Pension funds, government retirement funds	Employer and employee contributions	Corporate bonds and stock
<b>Investment intermediaries</b>		
Finance companies	Commercial paper, stocks, bonds	Consumer and business loans
Mutual funds <b>risky</b>	Shares	Stocks, bonds
Money market mutual funds	Shares	Money market instruments

## Investment banks

- Don't take deposits.
- Advises corporations on type of security to issue and then purchase the security at a predetermined price and resells on the market (underwriting).
- Act as deal makers and earn fees on mergers and acquisitions.

## Regulation of the financial system

- To reduce asymmetric information problems
- 1) Increase information available to investors
  - Provisions of information is improved by requiring companies issuing securities to report details about assets and liability, earnings, sales of stock
  - Preventing insider trading.
- 2) Ensure the soundness of the financial system.
  - Soundness is ensured by restrictions on entry, disclosure, restrictions on assets and activities, deposit insurance, limits on competition and restrictions on interest rates.

## Chapter 3: What is money

### Meaning of money

- Money is defined as anything that is generally accepted in payments for goods or services or in repayment of debts.
- It is measured as currency plus deposits. Money = Currency + Deposits
- Currency is paper money and coins
- Wealth is the total collection of pieces of property that serve to store value such as bonds, art, land, houses and cars.
- Income is the flow of earning per unit of time.
- Money is a stock variable.

### Functions of money

- 1) Medium of exchange
    - Solves the double coincidence of wants (finding some one who has what you want at the same time they want what you have), leads to high transaction costs.
    - Money promote efficiency by eliminating time spent exchanging goods and services
    - Encourages specialisation and division of labour.
    - Money reduces transaction costs.
  - 2) Unit of account
    - It is used to measure value in the economy
    - Lowers transaction costs by reducing the number of prices that need to be considered.
  - 3) Store of value
    - A repository of purchasing power over time and enables delayed purchasing.
    - Money is the most liquid asset of all because it is a medium of exchange as it does not need to be converted to anything else.
    - Not the most attractive store value and depends on the price level.
    - During inflation less money is held.
- For a commodity to function as money it must be:
- 1) Easily standardised to ascertain value.
  - 2) Widely accepted
  - 3) It must be divisible
  - 4) Easy to carry
  - 5) Not deteriorate quickly

## Evolutions of payment systems

- 1) Commodity money
  - Made up of precious metals such as gold and silver
  - From ancient times to several hundred years ago
  - Problem is the form of money is heavy and hard to transport
- 2) Fiat money
  - Paper currency decreed by governments as legal tender but not convertible into coins or precious metals.
  - Advantage is that it is lighter than coins or precious metal
  - Can be accepted as medium of exchange if there is trust in authorities and extremely difficult to counterfeit.
  - Easy to change currency due to the legal guarantee, e.g. Euro.
  - Disadvantages is easily stolen, and expensive to transport in large amounts because of bulk.
- 3) Checks
  - An instruction from your bank to transfer money from your account to another account when check is deposited.
  - Don't need to carry around large amounts of currency
  - Frequent back and forth payments cancel out.
  - Reduces transportation costs and improves economic efficiency.
  - Make large payments much easier
  - Reduced the possibility of theft because they proved receipts for purchases.
  - Takes time for checks to get from one place to another.
  - Takes a few days to clear payment in check account.
  - Processing checks is costly.
- 4) Electronic payment
  - Electronic transfer payments due to adoption of cheap computers and internet.
  - Allows recurring automated payments
  - Large cost savings over using checks.
- 5) E-money
  - Money that exist only in electronic form.
  - Debit cards allows consumers to purchase goods and services electronically.
  - Store-value card are repurchased for specific amounts.
  - Smart cards contain chips and are loaded with cash from a bank account when needed.
  - e-cash is used on the internet to purchase goods, and is money transferred to a PC from a bank and secured by cryptography..
  - Cryptocurrencies like bitcoin secured by cryptography and proof of work scripts.

## Notes on credit exclusion from $M = C + D$

- Not all forms of credit are counted as money.
- Two forms of credit.
  - 1) Credit cards held by consumers.
    - Credit cards normally provide credit up to some limit
    - The credit provided only have to be settled at a later stage
  - 2) Trade credit.
    - Trade credit is when firms sell their products to the trade sector, on condition that payment for the goods is made at a future date

- Credit in both these two forms serves as a medium of exchange, but these forms of credit do not lead to an increase in cash or deposits, and the money stock is not affected.
- Not included because of difficulties in measuring these forms of credit.
- The provision of trade credit, for example, may lead to indirect increases in money supply.

## Measuring money in SA

- Defined as currency plus deposits held by domestic, private nonbank sector at commercial banks.
- In South Africa currency is all the paper money and coins in circulation less cash held in bank vaults. →  $M = C + D$
- Deposits are all domestic private non-bank deposits in banks and excludes:
  - 1) Government deposits at commercial banks
  - 2) Foreign bank deposits at commercial banks
  - 3) Cash held by banks themselves (vault cash), Excluded because they are not available for spending by the private sector and cannot function as a medium exchange.
- Economic transactions in principle do not affect the money stock.
- The amount of currency in circulation is known since only the central bank issues currency.
- Because deposits are always held at banks, banks know the exact amount of deposits held by the non-bank (private) sector.
- Monetary authorities: SARB and the CPD (Corporation for public deposits)
- Commercial banks. Only registered banks and mutual banks, the Landbank and the Postbank are classified as other depository institutions.

## Monetary aggregates

- Stock variables measured at month end.
- 1) M1A
  - Consists of cash (coins and banknotes) + cheque and transmission deposits
  - Cheque and transmission deposits are no interest deposits mainly used to make payments.
  - If interest rate rises on medium to long-term deposits there will be a transfer into medium to long-term deposits.
  - In SA constituents small portion of M3
- 2) M1 Narrow definition.
  - M1A + other demand deposits by private sector.
  - Other demand deposits are monetary deposits other than transaction or chequeable deposits.
  - Other demand deposits are deposits that are convertible into cash on demand, and normally carry a payment facility.
  - High interest rates on other assets, means opportunity cost of keeping funds in monetary demand deposits is high, and funds are shifted to interest-bearing deposits.
  - In SA constituents large portion of M3
- 3) M2
  - a broader definition of money
  - M1 + plus deposits
  - Includes short-term (1 to 31 days) and medium-term deposits (32-180 days) such as savings deposits, savings bank certificates, "share" investments, negotiable certificates and promissory notes.

- Cannot be converted into cash on demand, but only after some time, does not carry a payment facility.
  - Near money, because terms are short and they are closely related and substitutes for demand monetary deposits in M1,
  - They are liquid.
  - In SA constituents large portion of M3
- 4) M3
- The most comprehensive measure of money
  - M2 + long-term deposits.
  - Includes all monetary and non-monetary deposit liabilities of the monetary banking sector.
  - Long term deposits are relatively liquid.
  - Because it involves considerable effort and cost to move funds between the components of M3 and financial assets that do not form part of M3, the M3 monetary aggregate is much more stable than its components, and is a much better indicator of domestic spending.
- What causes money stock to increase**
- 1) Bank loans to private nonbank sector (Most important)
  - 2) Transactions in financial assets between the banking sector (central and commercial banks) and the private nonbank sector
  - 3) Government transactions with the private nonbank sector
  - 4) Foreign exchange transactions
- Implications of the government printing money**
- Two types:
- 1) Printing banknotes and coins to finance expenditure.
    - Only SARB has the right to print money.
    - SARB prints money and sells it to banks (replaces old notes and for private sector cash requirements **Vault Cash**). The SARB profits (Income less costs) are then transferred to government bank accounts. No increase in money supply (Government deposit excluded).
    - Government then spends money and private sector deposits increase, therefore money supply increases.
    - Normally not a problem (cash component small proportion of total money stock) unless government is corrupt and abuses the processes creating excess money.
  - 2) Government forces the central bank to buy excessive issues of government securities
    - Monetisation of government debt.
    - Central banks are not independent enough
- MV+PY and therefore an increase in money stock causes an increase price level.
  - Hyperinflation occurs when, over the medium to long term, a vicious cycle of (money creation → inflation → money creation) occurs..
  - In Zimbabwe it destroyed both the financial sector and the economy, caused untold hardship and misery to the population, with the poor, being unable to protect themselves against the ravages of high inflation, suffering most.

## Part 2

# Chapter 4: Understanding interest rates

## Measuring Interest Rates

- Present value (PV) a dollar paid to you one year from now is less valuable than a dollar paid today because you can earn interest on a dollar today. Enables comparing the values of credit instruments with different payment timings.

### 4 types of credit market instruments

- 1) Simple loan such as many money market instruments. Borrowed funds repaid at maturity with additional interest payment.  
→ Simple interest rate equals yield to maturity = NPV.
- 2) Fixed-payment loan (fully amortised loan), same payment every month, which includes interest and principal, such as mortgages.  
→ Yield to maturity = IRR.
- 3) Coupon bond, pays a fixed coupon payment every year until maturity when face/par value is repaid, such as us treasury bonds, corporate bonds. Identified by 4 pieces of information: Face value, issuing agency, maturity date, coupon rate. Yield to maturity = IRR.  
→ Priced at face value, then yield to maturity = coupon rate.  
→ Price of a coupon bond and yield to maturity are negatively related, when the interest rate rises, the price of the bond falls.  
→ The yield to maturity is greater than the coupon rate when the bond price is below its face value.  
→ **Perpetuity (consol) bond**, has no maturity date and no repayment of principle, and that makes fixed coupon payments forever.  
→ Current Yield is yearly coupon payment divided by the price of the security.
- 4) Discount bond, (zero coupon bond) bought at a discount of its face-value and then repaid at face value at maturity, us treasury bills, savings bonds. No interest payments.  
→ Yield to maturity is the increase in price over the year divided by the initial price.  
→ Can have negative interest rates and purchasing power is not fully compensated.  
→ The yield to maturity is negatively related to the current bond price.

### Yield to maturity

- The interest rate that equates the present value of cash flow payments received from a debt instrument with its value today.
- Makes good economic sense and therefore most accurate measure of interest rates.

### The distinction between interest rates and returns

- Rate of capital gain is the change in the bond's price relative to the initial purchase price.
- Return on a bond is the current yield + rate of capital gain.
- Rate of return is defined as the payments to the owner plus the change in value, expressed as a fraction of its purchase price.
- The return on a bond will not necessarily equal the yield to maturity on that bond, due to price fluctuations giving higher or lower capital gains.
- Prices and returns for long-term bonds are more volatile than those of shorter term bonds.
- The only bond whose return equals the initial yield to maturity is one whose time to maturity is the same as the holding period.

- A rise in interest rates is associated with a fall in bond prices, resulting in capital losses on bonds whose terms to maturity are longer than the holding period.
- The more distant a bond's maturity, the lower the rate of return that occurs as a result of the increase in the interest rate.
- The more distant a bond's maturity, the greater the size of the percentage price change associated with an interest rate change.
- Paper loss if bond is not sold.

## Interest rate risk

- Prices and returns for long-term bonds are more volatile than those for shorter-term bonds due to the sensitivity of longer term bonds to interest rate changes.
- Due in large part to the term to maturity being more than the holding period.
- Bonds with a maturity that is as short as the holding periods have no interest rate risk.
- Reinvestment risk: when the holding period is longer than the term to maturity of a bond, due to uncertain future interest rates when reinvestment occurs.

## The distinction between real and nominal interest rates

- Real interest rate: nominal rate less expected inflation.  $r = i - \pi^e$
- Real interest rate reflects the real cost of borrowing.
- ex ante real interest rate is before the fact and ex post real interest rate is after the fact.
- When the real interest rate is low there are greater incentives to borrow and fewer incentives to lend.
- Real returns which indicate the amount of extra goods and services that can be purchased.
- Real interest rates are a more accurate indicator of the tightness of credit market conditions.

## Indexed bonds

- Interest and principal payments are adjusted for changes in the price level.
- Provide a direct measure of a real interest rate.
- They are useful because to monetary policy makers because subtracting their interest rates from a nominal rate on a non-indexed bond, they give insight into expected inflation.

## Chapter 5: The behaviour of interest rates

### Determinants of asset demand

- Wealth: total resources owned by an individual, including all assets.
- Expected Return: the return expected over the next period on one asset relative to another.
- Risk: the degree of uncertainty associated with the return on an asset relative to alternatives.
- Liquidity: the ease and speed with which an asset can be turned into cash relative to other assets.

### Theory of Portfolio choice

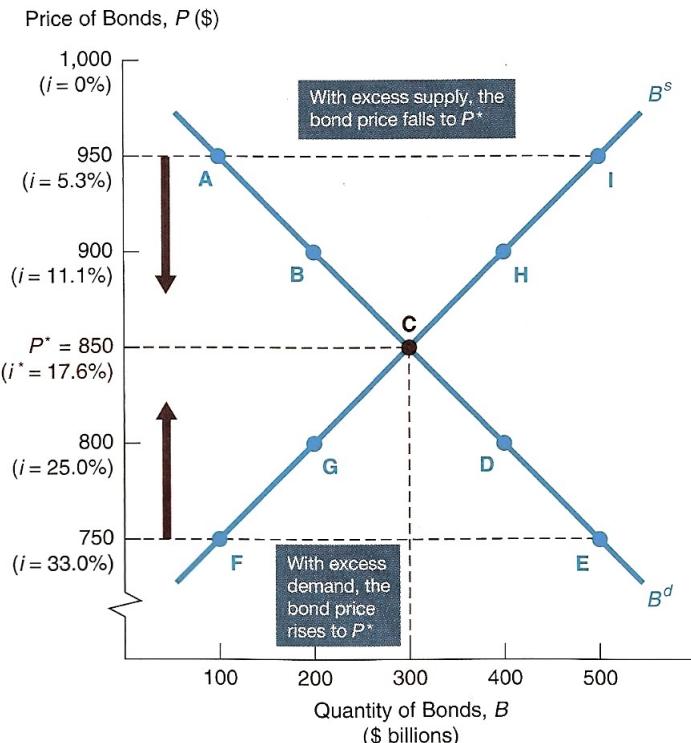
- How much of an asset people want to hold in their portfolios. An states the facts in the table below.

## Response of the Quantity of an Asset Demanded to Changes in Wealth, Expected Returns, Risk, and Liquidity

Variable	Change in Variable	Change in Quantity Demanded
Wealth	↑	↑
Expected return relative to other assets	↑	↑
Risk relative to other assets	↑	↓
Liquidity relative to other assets	↑	↑

## Supply and demand in the bond market

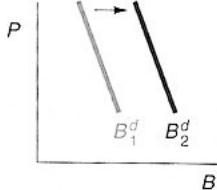
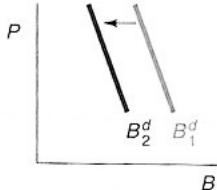
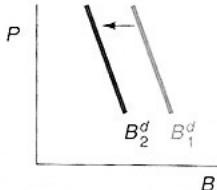
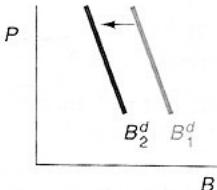
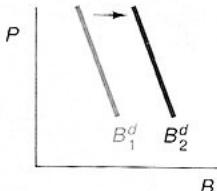
- Demand curve, relationship between quantity demanded and price or interest rate. It has a downward slope indicating lower prices for the bond the quantity demand is higher, ceteris paribus. Lenders of funds.
- Supply curve, relationship between quantity supplied and price, ceteris paribus. Higher prices means higher supply. Borrowers of funds. The higher the price of bonds, the more the borrower receives and the lower the interest rate which the borrower must pay.
- Market Equilibrium. Clearing price. Quantity of bonds demanded equals quantity of bonds supplied. The market head towards this point and settles.  $B^d = B^s$
- Excess supply, people want to sell more bonds than others want to buy.
- Excess demand, people want to buy more bonds than others want to sell.
- The asset market approach does demand and supply analysis in terms of stocks of assets and not flows, due to the inherit difficulty of flows especially in the face of inflation.
- If households save more, wealth increases.



## Changes in Equilibrium interest rates

→ Simpler analysis of effects from changes in inflation.

### Factors That Shift the Demand Curve for Bonds

Variable	Change in Variable	Change in Quantity Demanded at Each Bond Price	Shift in Demand Curve
Wealth	increase from business cycle expansion or increase in propensity to save.	↑	
Expected interest rate	higher expected interest rates lowers expected return and hence demand higher expected returns in other assets lowers demand for bonds.	↑ ↓	
Expected inflation	higher expected inflation leads to higher returns from other assets hence lower relative returns from bonds and hence lower demand higher expected inflation leads to lower real interest rates and lower relative bond returns	↑ ↓	
Riskiness of bonds relative to other assets		↑ ↓	
Liquidity of bonds relative to other assets		↑	

Note: Only increases in the variables are shown. The effect of decreases in the variables on the change in demand would be the opposite of those indicated in the remaining columns.

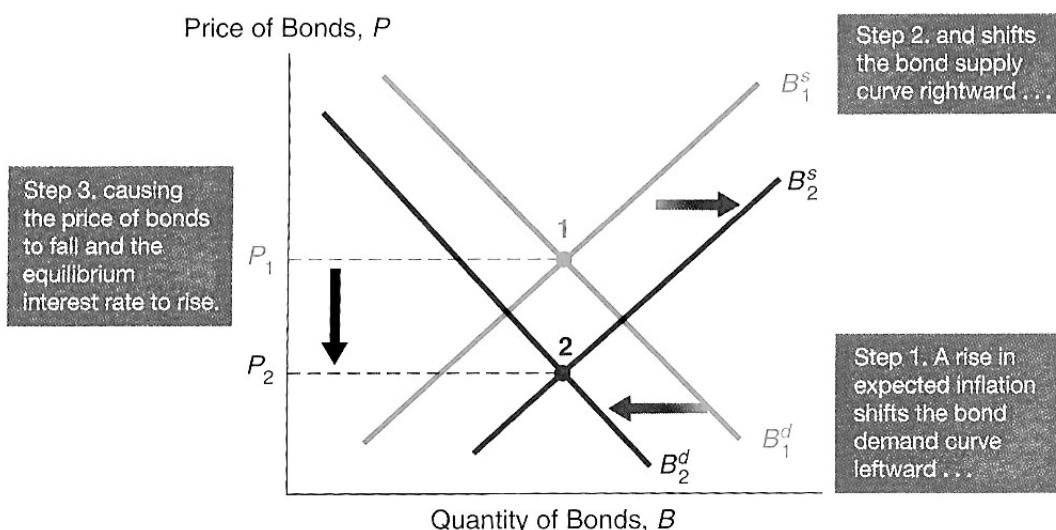
## Factors That Shift the Supply of Bonds

Variable	Change in Variable	Change in Quantity Supplied at Each Bond Price	Shift in Supply Curve
Profitability of investments in a business cycle expansion the supply of bonds increase due to increase investment	↑	↑	
Expected inflation  when inflation increases the real cost of borrowing falls	↑	↑	
Government deficit  during a deficit governments increase the sale bonds to obtain more financing.	↑	↑	

Note: Only increases in the variables are shown. The effect of decreases in the variables on the change in supply would be the opposite of those indicated in the remaining columns.

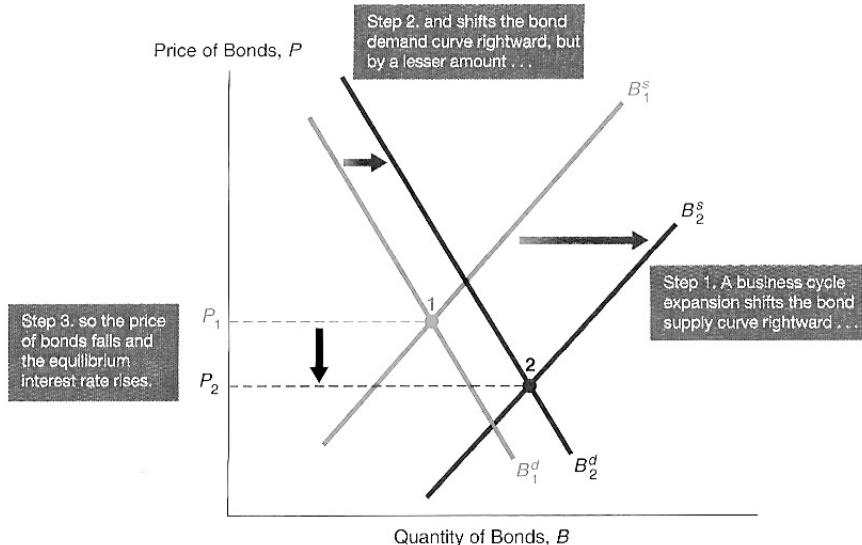
## Changes in the interest rate due to expected inflation, the Fisher Effect

- When expected inflation rises, interest rates will rise, also called the Fisher Effect.
- Ambiguous change in quantity, but certain increase in interest rate.



## Changes in the interest rate due to a business cycle expansion

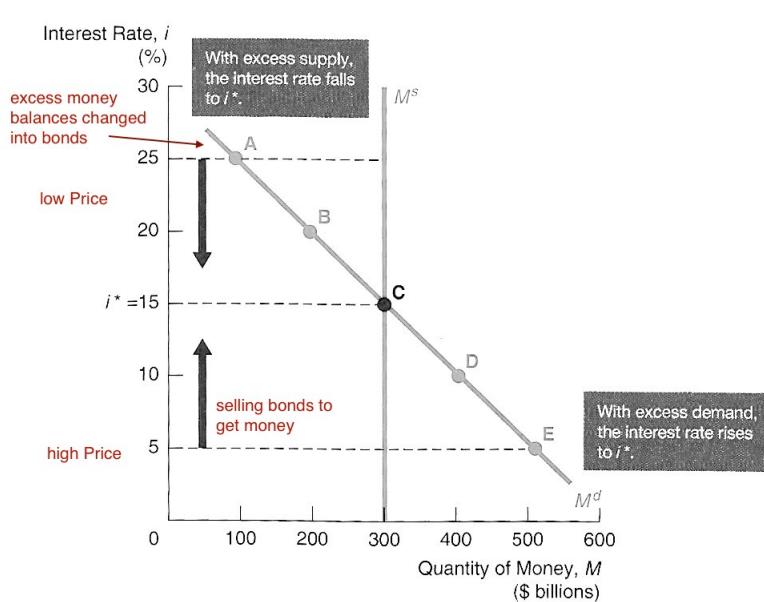
- Amounts of goods and services rise with a corresponding increase in national income and business has more opportunities to expand, therefore they increase the supply of bonds.
- An increase in wealth will, via the theory of portfolio choice, increase the demand for bonds.
- Ambiguous change in interest rate but certain increase in quantity.



## Supply and demand in the market for money: The liquidity preference framework

$$B^S + M^S = B^d + M^d \text{ or } B^S - B^d = M^d - M^s$$

- Simpler analysis is of effects from changes in income, price level and supply of money.
- Simplifying assumptions:
  - 1) Assumes there are only two kinds of assets, money and bonds which equals total wealth, and therefore implicitly ignores any effects on interest rates from changes in expected returns on real assets such as cars.
  - 3) Assumes money has a zero rate of return as it earns no interest. Supply curve is vertical which is not the case in South Africa.
- Demand curve: As the interest rate rises the expected return of money relative to bonds falls and the demand for bonds increases. The quantity of money demand and interest rate are negatively related because of the rising opportunity costs of holding money when interest rates are increasing.
- Supply curve: Central bank supplies a fixed quantity.
- Equilibrium:  $M^s = M^d$  at the intersection of the supply and demand curves.
- When the price level increases more money will be demanded to restore purchasing power.



## Changes in Equilibrium interest rates in the LPF

Factors That Shift the Demand for and Supply of Money

Variable	Change in Variable	Change in Money Demand ( $M^d$ ) or Supply ( $M^s$ ) at Each Interest Rate	Change in Interest Rate
Income 1) wealth increases more money held for store of value 2) more money for transactions medium of exchange	↑	$M^d \uparrow$	↑
Price level restore purchasing power	↑	$M^d \uparrow$	↑
liquidity effect Money supply engineered by Central bank	↑	$M^s \uparrow$	↓

Graphs illustrating the shifts in the money market:

- Income shift: A rightward shift of the demand curve from  $M_d^1$  to  $M_d^2$  leads to a higher equilibrium interest rate  $i_2$  and a lower quantity of money  $M$ .
- Price level shift: A rightward shift of the demand curve from  $M_d^1$  to  $M_d^2$  leads to a higher equilibrium interest rate  $i_2$  and a lower quantity of money  $M$ .
- Money supply shift: An increase in the money supply from  $M_s^1$  to  $M_s^2$  leads to a lower equilibrium interest rate  $i_2$  and a higher quantity of money  $M$ .

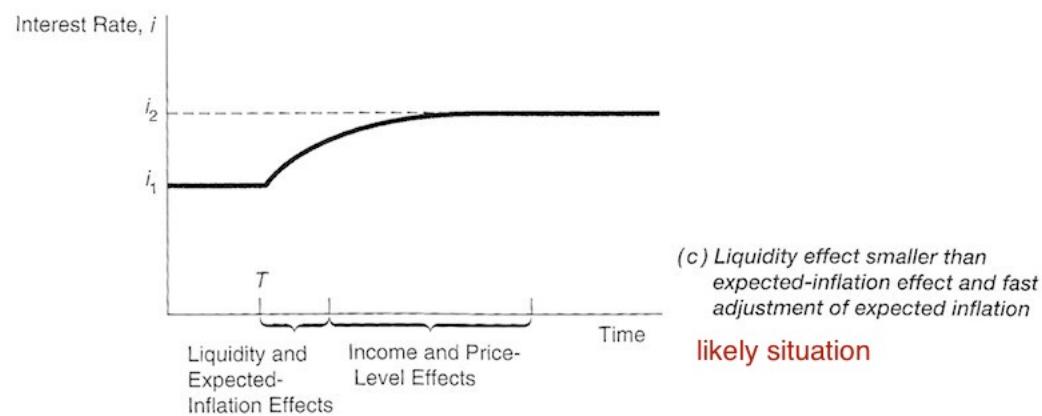
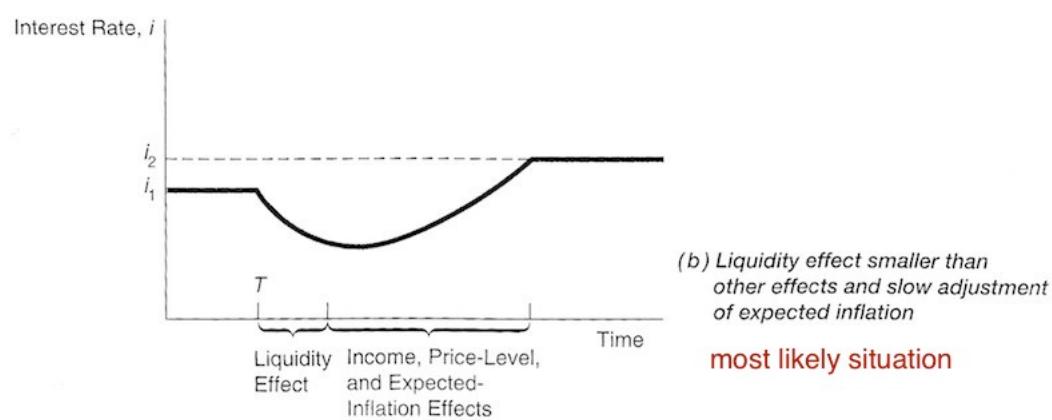
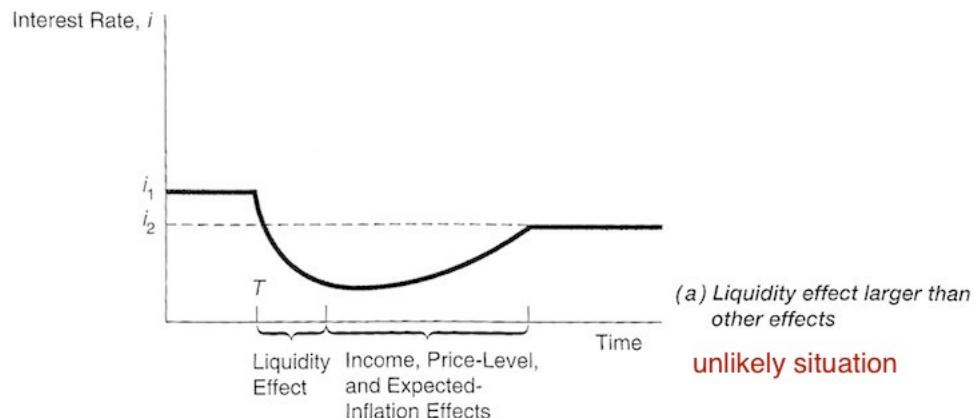
Note: Only increases in the variables are shown. The effect of decreases in the variables on the change in demand would be the opposite of those indicated in the remaining columns.

## 3 effects of changes in money supply

- 1) The income effect of an increase in the money supply is a rise in interest rates in response to the higher level of income.
- 2) the price-level effect from an increase in the money supply is a rise in interest rates in response to the rise in price level.

- 3) the expected-inflation effect of an increase in money supply is a rise in interest rates in response to the rise in the expected inflation rate. The expected-inflation effect will persist only as long as the price level continues to rise.
- Basic difference between price-level effect and expected-inflation effect is that the price-level effect remains even after prices have stopped rising whereas the expected inflation effect disappears.

## Response over time to an increase in money supply growth



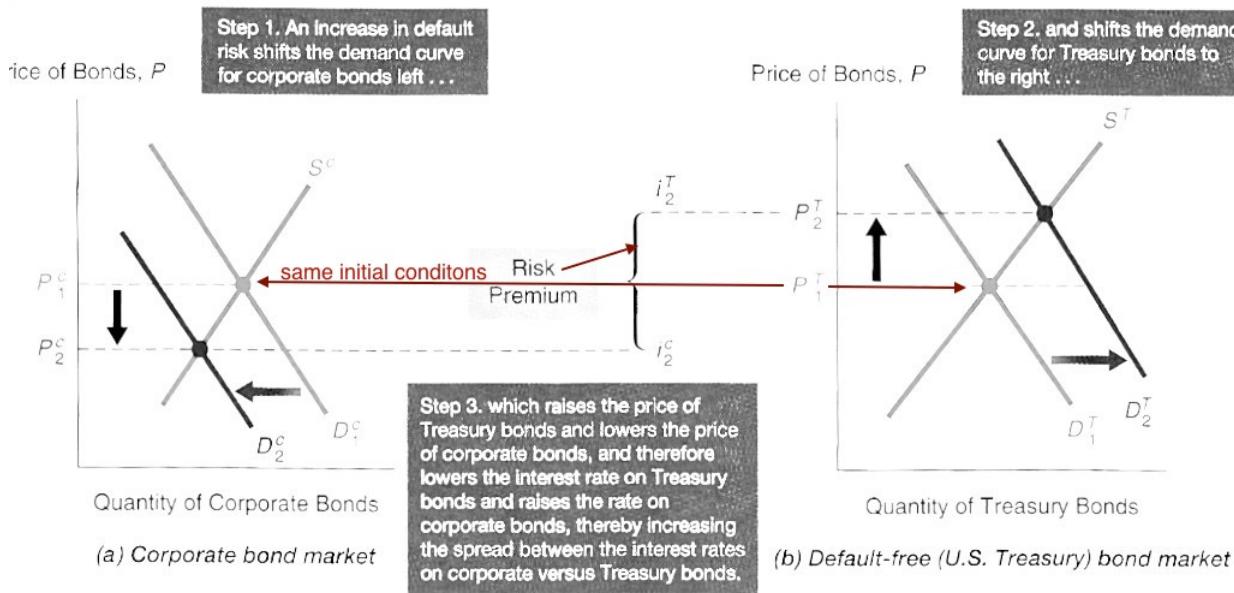
# Chapter 6: The risk and term structure of interest rates

## Risk structure of interest rates.

- The risk structure of interest rates is the relationship among interest rates on bonds with the same maturity.
- 3 Factors affecting risk structure

### 1) Default risk.

- Default risk is the risk of the issuer of the bond being unable or unwilling to make interest payments or pay off the face value when the bond matures.
- Bonds such as US Treasury bonds are considered **default free**, as they are backed by the US government which can increase taxes or print money to meet its obligations.
- The **risk premium** is the difference between bonds with default risk and bonds that are default free.
- A bond with default risk will always have a positive risk premium.
- Increase in default risk will raise the risk premium.
- Credit ratings agencies provide information about the likelihood of a bond issuer defaulting. They can have conflicts of interest in both structuring debt instruments and selling them.
- Junk bonds have high risk premium but are high-yield bonds.

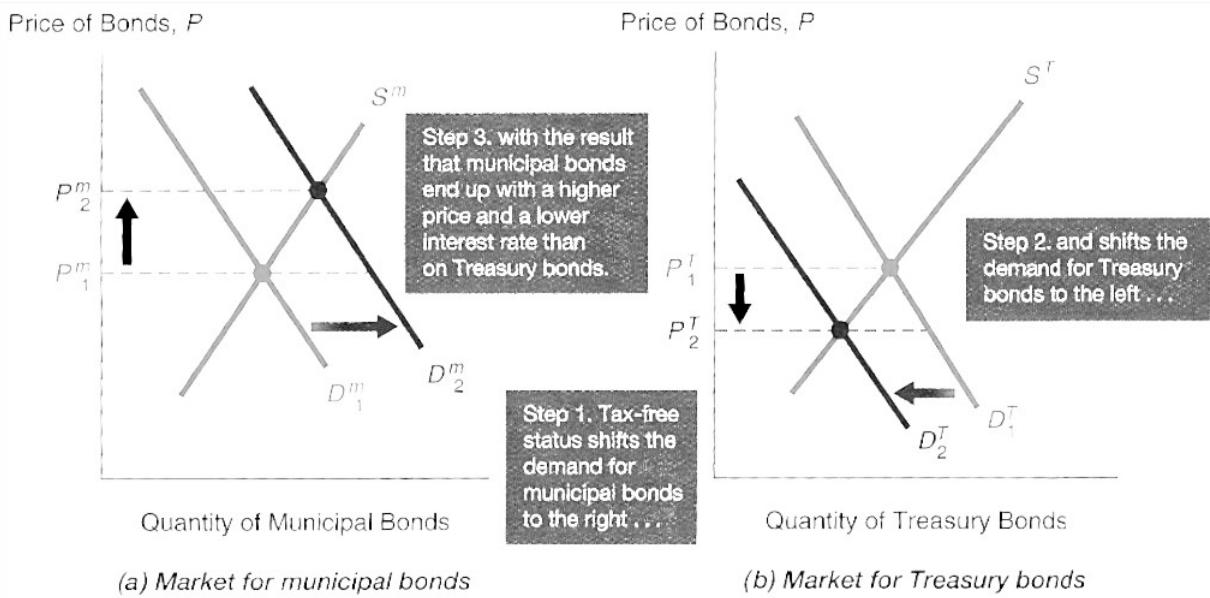


### 2) Liquidity

- the higher the bond's liquidity the more appealing it is and therefore there would be a rightward shift in the demand for bonds curve.
- US Treasury bonds are the most liquid of all bonds.
- Same graph as default risk case.

### 3) Income tax considerations.

- Bonds that are exempt from tax have higher expected returns and hence there is an increased demand for them.
- Bonds with tax free interest payments have lower interest rates.
- Municipal bonds are not default free and not as liquid as treasury bonds.

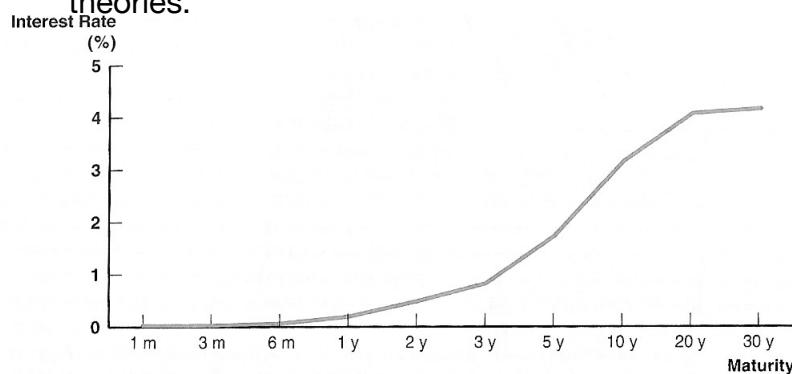


### Term structure of interest rates and the yield curve.

- Bonds with identical risk, liquidity and tax characteristics may have different interest rates because their time remaining to maturity is different. A plot of the yield is called a yield curve.
- Upward sloping yield curves (usual case) indicate long-term interest rates are higher than short term interest rates.
- Flat yield curves mean same short and long-term interest rates
- Downward (inverted) sloping yield curves mean long-term rates are below short-term rates.
- Yield can also have more complex shapes as in up and down.

### 3 empirical facts to be explained

- 1) interest rates on bonds of different maturities move together over time. Explained by Expectations and liquidity premium theories.
- 2) when short-term interest rates are low, yield curves are more likely to have an upward slope and when short-term rates are high yield curves will be inverted. Explained by Expectations and liquidity premium theories.
- 3) yield curves almost always slope upward. Explained by Segmented, and liquidity premium theories.



### Expectations theory

- The interest rate on a long term-term bond will equal an average of the short-term interest rates that people expect to occur over the life of the long-term bond.

- The key assumption is that buyers of bonds do not prefer bonds of one maturity over another, so they will not hold any quantity of a bond if its expected return is less than that of another bond with a different maturity
- Implies Bonds with different maturities are perfect substitutes therefore same expected return.
- When the yield curve is upward sloping short term interest rates are expected to rise. Or the average of expected future short-term rates is higher than the current short-term rate.
- When the yield curve is inverted the average of future short-term interest rates is expected to be lower than the current short-term rate, implying that short-term interest rates are expected to fall.
- If the yield curve is flat short-term interest rates are not expected to change on average in the future.
- Explaining empirical facts:
  - 1) A rise in short term rates will raise people's expectation of future short-term rates and given that long-term rates are an average of short-terms rate they to will rise and hence move together. 2) When short term rates are low people will expect them to rise in the future and hence the average of future short-term rates rate is will be higher relative to the current short-term rates hence long-terms rates will bi higher and the yield curve has an upwards slope. Conversely for the high short-term rates and the inverted yield curve.
  - 3) It cannot explain this fact as it predicts a typical curve would be flat because a rise or fall in interest rates is equally likely.

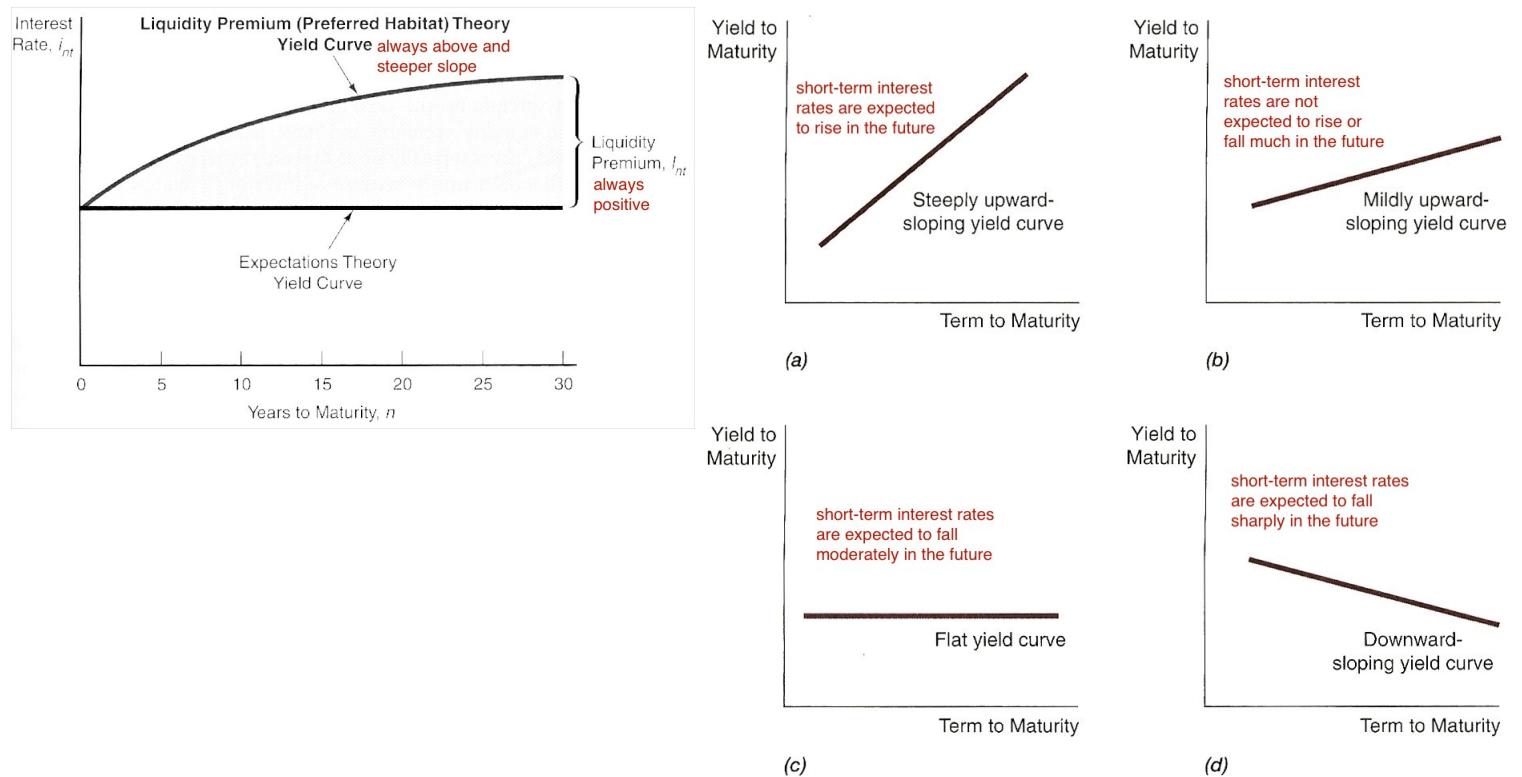
## **Segmented market theory**

- Sees markets for different-maturity bonds as completely separate and segmented no substitution and no effect on each other expected returns.
- Bond are not substitutes at all due to the fact that investors have a strong preference for bonds of one maturity but not for another and are only concerned with the expected returns of their preference. This is due to the preference for a certain holding period. (holding period = term to maturity = no interest rate risk).
- The interest rate for each bond with a different maturity is then determined by supply and demand for that bond.
- Explaining empirical facts:
  - 1) Unable to explain fact due to the fact that different maturity bonds are segmented and have no influence on each others interest rates.
  - 2) Unable to explain because it is not clear how demand and supply for short-term bonds versus long-terms bonds change with the level of short term interest rates.
  - 3) Demand for short-term bonds is higher due to the lower risk hence higher prices and lower interest rates and long term bonds have lower prices and higher interest rates. This explain the normal upward slope.

## **Liquidity premium theory and preferred habitat theory**

- Most widely accepted because explain facts the best and the other two theories lay ground work for this one, and shines a light on how economist modify theories to empirical evidence.
- The liquidity premium theory states the the interest rate on a long-term bond will equal an average of short-term interest rates expected to occur over the life of the long-term bond plus a liquidity premium (term premium) that responds to supply and demand.
  - Key assumption is that bonds of different maturities are substitutes with their expected returns influencing one another, they are not perfect substitutes.

- Investor tend to prefer short term bonds as they have lower interest-rate risk.
- Investor must be offered a positive liquidity premium to induce them to hold longer-term bonds.
- Preferred habitat theory assumes investors have preference for bonds of one maturity over another and will only buy non-preferred bonds with higher expected returns.
  - Most investor prefer the shorter-term habitat and therefore longer term bonds will have higher prices.
- Explaining empirical facts:
  - 1) A rise in short-term interest rates mean short-term rates will be higher on average and therefore so will long-term rates and so they move together.
  - 2) If short-term rates are high people expected them to come down, therefore average of future short term rates will be expected to be much more lower, therefore lower long-term rates (despite the liquidity premium) are lower and there is an inverted yield curve.
  - 3) Because the liquidity premium rises with a bond maturity because of the strong preference for short-term bonds.



## Evidence of term structure

- One test indicated spread between short and long-term does not always predict future interest rates because of fluctuations in the long term liquidity premium.
- New evidence suggests: Quite a bit of information in short-term and long-term structure, but unreliable at predicting rates over the intermediate term.
- Can also help forecast future inflation and business cycles.

### SA yield curve

- Extremely volatile

- The short-term bond yield is heavily affected by monetary policy and the repo rate.
- The long-term bond yield is heavily affected by inflation, foreign exchange markets and the general economic outlook.

## Part 3

### Chapter 8: An Economic analysis of financial structure

#### Eight basic facts about financial structure throughout the world

- 1) Stocks are not the most important source of external financing for business
- 2) Issuing marketable debt and equity securities is not the primary way in which businesses finance their operations.
- 3) Indirect finance is more important than direct finance
- 4) Banks are the most important source of indirect finance
- 5) The financial system is heavily regulated
- 6) Only large well-established companies have easy access to securities markets
- 7) Collateral is a prevalent feature of debt contracts
- 8) Debt contract are complicated legal documents placing substantial restrictions on borrowers

#### How financial intermediaries reduce transaction costs.

- Financial intermediaries stand between lender-savers and borrow-spenders.
  - They enable funds to be transferred from people with non-productive opportunities to people with productive opportunities.
  - In financial markets the costs of transacting is high.
- 1) Economies of scale
    - They bundle investors funds together to reduce the cost per individual investor.
    - The costs of a small transaction are similar to the costs of a large transaction.
    - Example a Mutual fund financial intermediary which sells shares to individuals and then invests the proceeds in bonds and stocks. The charge fees for administrating accounts.
    - They increase diversification of risk, buy purchasing a range of securities, as small investors would be compelled to keep all their eggs in the same basket, to keep costs down.
    - Economies of scale are important in lowering costs for communication and computerisation in financial transaction.
  - 2) Expertise
    - Expertises in things such as computer technology, providing help desks and information.
    - They provided liquidity services (easier transactions or being able to pay bills).

#### Lemons problem and adverse selection

- Buyers cannot asses the quality of used cars, therefore the price buyers will pay must reflect the average quality, between a low lemon and a high peach.
- The owners knows the quality of the used car
  - 1) If its low (lemon) they will be happy to accept the average price which is higher than a lemon.
  - 2) If its high(peach) then the owner knows the car is undervalued at the average price and may not sell.
- The result is fewer good cars and the average quality ill be low, hence few sales and a poorly functioning market.

- In the absence of asymmetric information where buyers know as much about the quality of the used car as the sellers then buyers will be willing to pay full value for good used cars.
  - Because buyers are getting a fair price they will sell, and the market will have many transactions.
  - Similar arguments for stock and bond markets.
  - Tools to solve adverse selection problem
- 1) Private production and sale of information
    - Provide the people supply funds with more details about the individuals or firms seeking finance.
    - Private companies collect and produce information that distinguishes good from bad.
    - Creates the free-rider problem, where people who don't pay for the information take advantage of the information other people have paid for.
    - If A paid for info to invest in undervalued securities, and B and many others copy A, then the price will go up and the security will no longer be undervalued and hence A will not buy info in the future.
    - The weakened ability of private firms to profit from selling information will lead to less information in the market and an increase in adverse selection.
  - 2) Government regulation to increase information
    - Government would be reluctant to release negative information as it would be politically unfavourable.
    - Governments regulate securities markets to encourage firms to reveal honest and accurate information about themselves, and requiring audits.
    - Does not always work e.g. Enron. Statistics do not reveal the entire picture and bad companies tend to paint the information in a good light.
  - 3) Financial intermediation
    - They become experts in the production of information about firms and sorting the good credit risks from the bad ones.
    - The higher profits from the information serves to incentivise information production.
    - They avoid the free-rider problem by making private non-traded loans and not public purchases.
    - Banks have an increased role in developing economies because they reduced adverse selection
    - As information becomes easier to acquire the role of banks will decline.
    - Easier for bigger firms to get funds in the direct route as more information about them is available.
  - 4) Collateral and net worth
    - Reduces the lenders loss in the result of default and therefore reduces adverse selection
    - Lenders are more willing to make loans because of the reduce risk.
    - Borrowers are more willing to supply collateral to get the loans
    - High net worth (difference between assets and liabilities) can serve as collateral

## Moral hazard and the choice between debt and equity contracts

Principal-agent problem (Moral hazard in equity contracts)

- Separation of ownership and control involves moral hazard, as managers (agents) may act in their own interests rather than in the interests of the stock-holders (principles) because the managers have less incentive to maximise profits than shareholders do.

- Examples are pursuing personal interests like diverting funds, or acquisitions of firms that increase personal power but do not increase profitability.
- Would not arise if owners had complete information about the managers and could prevent wasteful or fraudulent expenditure.
- Would also not arise if there was no separation of ownership and control.
- Tools to solve moral hazard problem
  - 1) Production of information: Monitoring (Costly state verification)
    - Principles can monitor agents actions, conduct regular audits
    - Can be expensive in terms of time and money and makes equity contracts less desirable.
    - Subject to free-rider problem where if you know other stockholders are monitoring the agents then you can take a free ride on their activities, if everyone does this the moral hazard increases.
  - 2) Government regulation to increase information.
    - Governments have laws to force firms to adhere to standard accounting principles that make profit verification easier.
    - Impose criminal penalties for fraud and theft.
    - Only partly effective as fraud detection is difficult and agents have incentive to obfuscate.
  - 3) Financial intermediation
    - 
    - 
    -
  - 4) Debt contracts
    - 
    - 
    -

## Asymmetric Information Problems and Tools to Solve Them

<b>Asymmetric Information Problem</b>	<b>Tools to Solve It</b>	<b>Explains Fact Number</b>
Adverse selection	Private production and sale of information	1, 2
	Government regulation to increase information	5
	Financial intermediation	3, 4, 6
	Collateral and net worth	7
Moral hazard in equity contracts (principal–agent problem)	Production of information: monitoring	1
	Government regulation to increase information	5
	Financial intermediation	3
	Debt contracts	1
Moral hazard in debt contracts	Collateral and net worth	6, 7
	Monitoring and enforcement of restrictive covenants	8
	Financial intermediation	3, 4

Note: List of facts:

1. Stocks are not the most important source of external financing.
2. Marketable securities are not the primary source of finance.
3. Indirect finance is more important than direct finance.
4. Banks are the most important source of external funds.
5. The financial system is heavily regulated.
6. Only large, well-established firms have access to securities markets.
7. Collateral is prevalent in debt contracts.
8. Debt contracts have numerous restrictive covenants.

## Chapter 9: Financial Crises in advanced economies

- |  |   |
|--|---|
| <p>1. A financial crisis occurs when a particularly large disruption to information flows occurs in financial markets, with the result that financial frictions increase sharply, thereby rendering financial markets incapable of channeling funds to households and firms with</p> | <p>productive investment opportunities, and causing a sharp contraction in economic activity.</p> |
| <p>2. Financial crises can start in advanced countries like the United States in several possible ways: mismanagement</p>  |   |

of financial liberalization/innovation, asset-price booms and busts, or a general increase in uncertainty when major financial institutions fail. The result is a substantial increase in adverse selection and moral hazard problems that lead to a contraction of lending and a decline in economic activity. The worsening business conditions and deterioration in bank balance sheets then triggers the second stage of the crisis, the simultaneous failure of many banking institutions, a banking crisis. The resulting decrease in the number of banks causes a loss of their information capital, leading to a further decline of lending and a spiraling down of the economy. In some instances, the resulting economic downturn leads to a sharp slide in prices, which increases the real liabilities of firms and households and therefore lowers their net worth, leading to a debt deflation. The further decline in borrowers' net worth worsens adverse selection and moral hazard problems, so that lending, investment spending, and

aggregate economic activity remain depressed for a long time.

3. The most significant financial crisis in U.S. history, that which led to the Great Depression, involved several stages: a stock market crash, bank panics, worsening of asymmetric information problems, and finally a debt deflation.
4. The global financial crisis of 2007–2009 was triggered by mismanagement of financial innovations involving subprime residential mortgages and the bursting of a housing price bubble. The crisis spread globally, with substantial deterioration in banks' and other financial institutions' balance sheets, a run on the shadow banking system, and the failure of many high-profile firms.
5. The 2007–2009 financial crisis did not lead to a depression because of aggressive Federal Reserve actions and worldwide government intervention through bailouts of financial institutions.

## Chapter 10: Financial crises in emerging market economies

1. Financial crises in emerging market countries develop along two basic paths: one involving the mismanagement of financial liberalization/globalization that weakens bank balance sheets and the other involving severe fiscal imbalances. Both lead to a speculative attack on the currency, and eventually to a currency crisis in which there is a sharp decline in the value of the domestic currency. The decline in the value of the domestic currency causes a sharp rise in the debt burden of domestic firms, which leads to a decline in firms' net worth, as well as increases in inflation and interest rates. Adverse selection and moral hazard problems then worsen, leading to a collapse of lending and economic activity. The worsening economic conditions and increases in interest rates result in substantial losses for banks, leading to a banking crisis, which further depresses lending and aggregate economic activity.
2. The financial crisis in South Korea follows the pattern described previously. It started with a mismanagement of financial liberalization and globalization, followed by a stock market crash and a failure of firms that

increased uncertainty, a worsening of adverse selection problems, a currency crisis, and then a full-fledged financial crisis. The financial crisis led to a sharp contraction in economic activity and a rise in inflation, as well as a weakening of the social fabric.

3. In contrast to the crisis in South Korea, the Argentine financial crisis started with severe fiscal imbalances. The recession, which had been ongoing since 1998, along with the deterioration of bank balance sheets when the fiscal imbalances led to losses from government bonds, which the banks had on their balance sheets, led to a worsening of adverse selection and moral hazard problems, a bank panic, a currency crisis, and then a full-fledged financial crisis. As in South Korea, the financial crisis led to a decline in economic activity and a rise in inflation in Argentina, but the economic contraction and rise in inflation was even worse.
4. Policies to prevent financial crises in emerging market economies include improving prudential regulation and supervision, limiting currency mismatch, and sequencing of financial liberalization.

# Chapter 11: Banking and the management of financial institutions

- |  |  |
|--|--|
| <p>1. The balance sheet of commercial banks can be thought of as a list of the sources and uses of bank funds. A bank's liabilities are its sources of funds, which include checkable deposits, time deposits, discount loans from the Fed, borrowings from other banks and corporations, and bank capital. A bank's assets are its uses of funds, which include reserves, cash items in process of collection, deposits at other banks, securities, loans, and other assets (mostly physical capital).</p> <p>2. Banks make profits through the process of asset transformation: They borrow short (accept short-term deposits) and lend long (make long-term loans). When a bank takes in additional deposits, it gains an equal</p> | <p>amount of reserves; when it pays out deposits, it loses an equal amount of reserves.</p> <p>3. Although more-liquid assets tend to earn lower returns, banks still desire to hold them. Specifically, banks hold excess and secondary reserves because they provide insurance against the costs of a deposit outflow. Banks manage their assets to maximize profits by seeking the highest returns possible on loans and securities while at the same time trying to lower risk and making adequate provisions for liquidity. Although liability management was once a staid affair, large (money center) banks now actively seek out sources of funds by issuing liabilities such as negotiable CDs or by actively borrowing</p> |
| <p>1. The balance sheet of commercial banks can be thought of as a list of the sources and uses of bank funds. A bank's liabilities are its sources of funds, which include checkable deposits, time deposits, discount loans from the Fed, borrowings from other banks and corporations, and bank capital. A bank's assets are its uses of funds, which include reserves, cash items in process of collection, deposits at other banks, securities, loans, and other assets (mostly physical capital).</p> <p>2. Banks make profits through the process of asset transformation: They borrow short (accept short-term deposits) and lend long (make long-term loans). When a bank takes in additional deposits, it gains an equal</p> | <p>amount of reserves; when it pays out deposits, it loses an equal amount of reserves.</p> <p>3. Although more-liquid assets tend to earn lower returns, banks still desire to hold them. Specifically, banks hold excess and secondary reserves because they provide insurance against the costs of a deposit outflow. Banks manage their assets to maximize profits by seeking the highest returns possible on loans and securities while at the same time trying to lower risk and making adequate provisions for liquidity. Although liability management was once a staid affair, large (money center) banks now actively seek out sources of funds by issuing liabilities such as negotiable CDs or by actively borrowing</p> |

## Part 4

# Chapter 14: Central banks: a global perspective

### Central Bank Independence:

**FOR:** Political pressures would impart an inflationary bias due to their short-term focus on winning the next election; this could lead to a political business cycle, with expansionary policy just before an election and contraction policy after. It could also be used to fund budget deficits. Politicians also lack the ability to control monetary policy, and suffer larger affects of the agency problem. Empirical evidence suggest Independence is best for targeting inflation but central banks should be accountable to parliament.

### AGAINST:

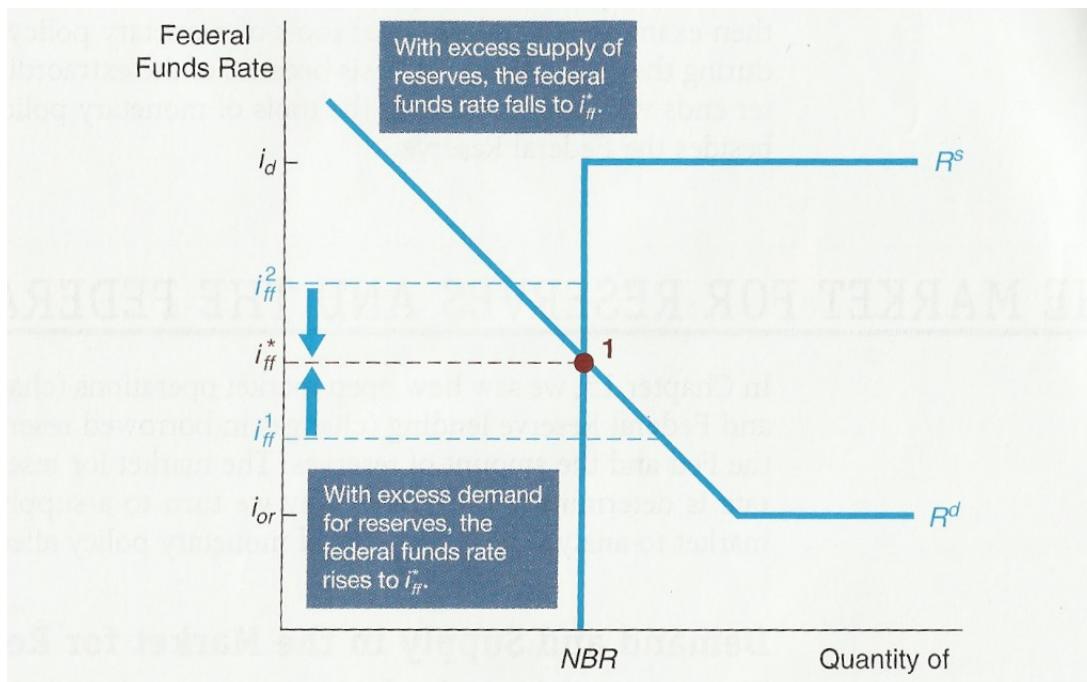
Undemocratic to be controlled by a few elites, with a lack of accountability. There needs to be a coordinated effort between fiscal and monetary policy. Central banks may pursue narrow self interests and can be bureaucratic.

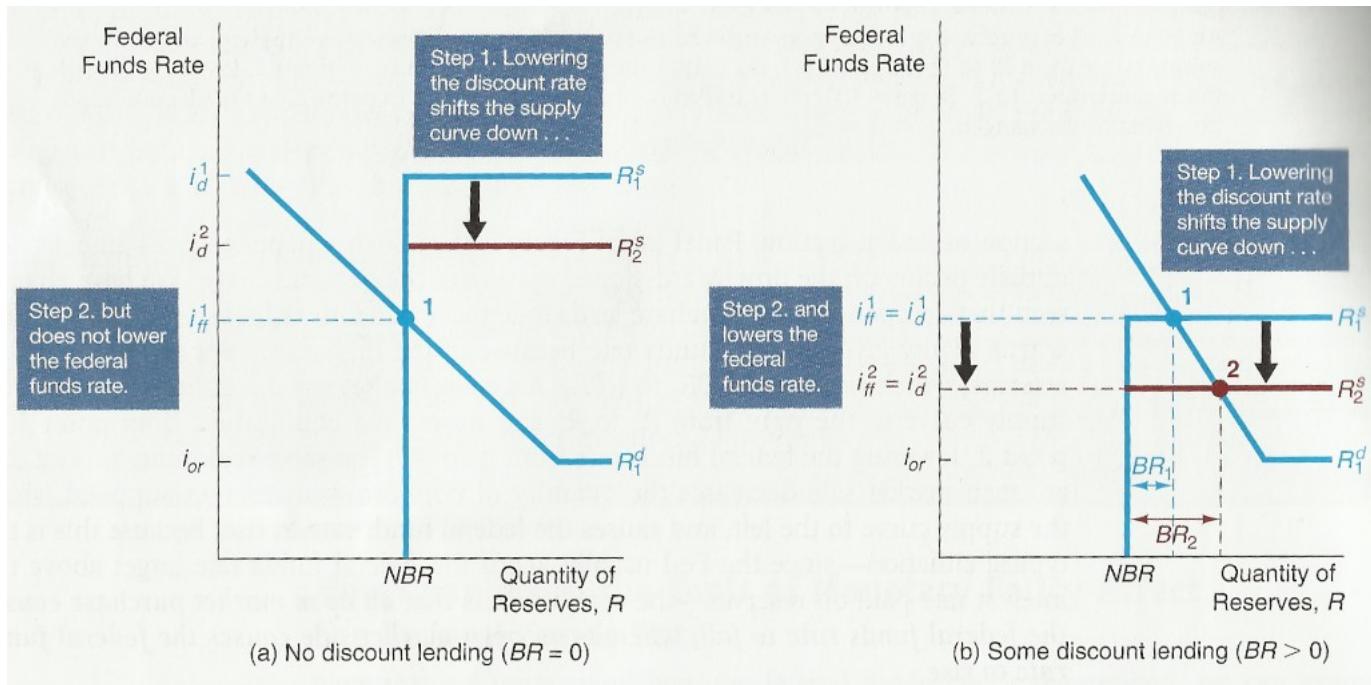
## Chapter 15: The money supply process

Money Supply Response				
Player	Variable	Change in Variable	Money Supply Response	Reason
Federal Reserve System	Nonborrowed monetary base, $MB_n$	↑	↑	More MB for deposit creation
	Required reserve ratio, $rr$	↑	↓	Less multiple deposit expansion
Banks	Borrowed reserves, $BR$	↑	↑	More MB for deposit creation
	Excess reserves	↑	↓	Less loans and deposit creation
Depositors	Currency holdings	↑	↓	Less multiple deposit expansion

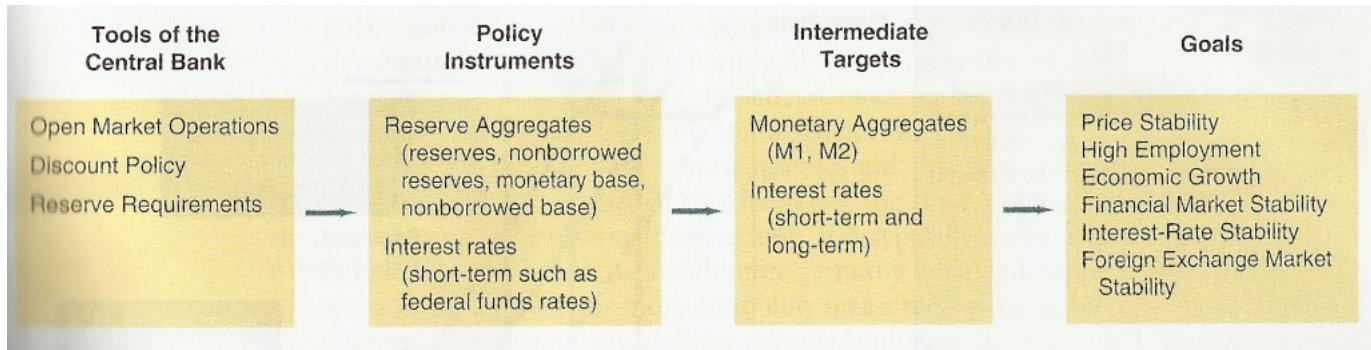
Note: Only increases (↑) in the variables are shown. The effects of decreases on the money supply would be the opposite of those indicated in the "Money Supply Response" column.

## Chapter 16: The tools of monetary policy

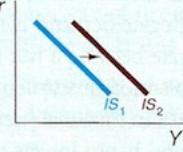
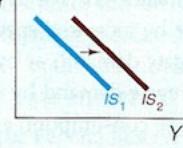
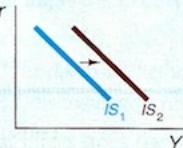
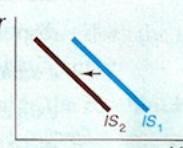
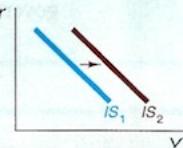
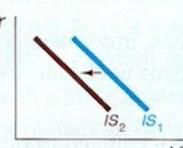




## Chapter 17: The conduct of monetary policy: Strategy and tactics



Shifts in the *IS* Curve from Autonomous Changes in  $\bar{C}$ ,  $\bar{I}$ ,  $\bar{G}$ ,  $\bar{T}$ ,  $\bar{NX}$ , and  $\bar{f}$ 

Variable	Change in Variable	Shift in <i>IS</i> Curve	Reason
Autonomous consumption expenditure, $\bar{C}$	↑		$C \uparrow Y \uparrow$
Autonomous investment, $\bar{I}$	↑		$I \uparrow Y \uparrow$
Government spending, $\bar{G}$	↑		$G \uparrow Y \uparrow$
Taxes, $\bar{T}$	↑		$T \uparrow \Rightarrow C \downarrow Y \downarrow$
Autonomous net exports, $\bar{NX}$	↑		$NX \uparrow Y \uparrow$
Financial frictions, $\bar{f}$	↑		$I \downarrow Y \downarrow$

Note: Only increases (↑) in the variables are shown; the effects of decreases in the variables on aggregate output would be the opposite of those indicated in the last two columns.

**Part 6****Chapter 20: Quantity theory, inflation and the demand for money**

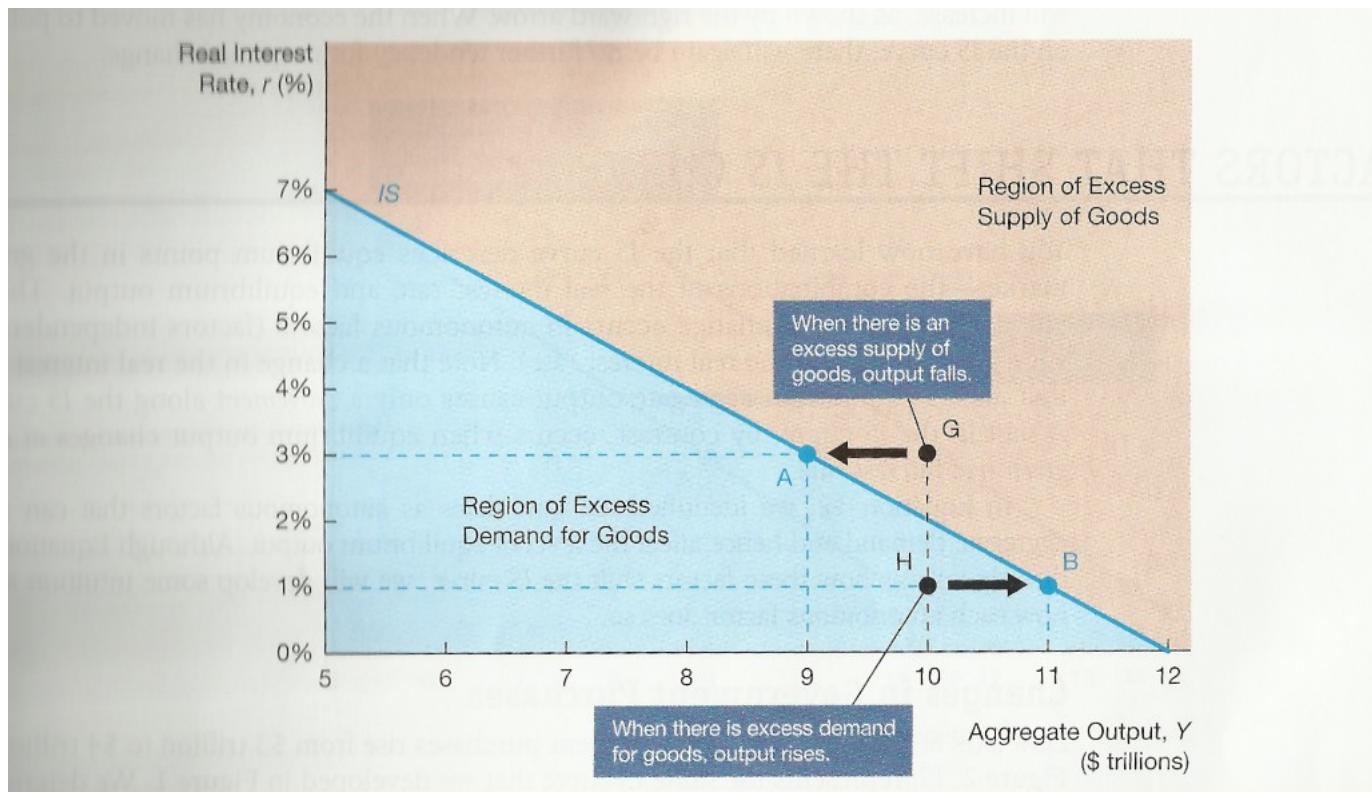
$$\text{Velocity of Money} = \frac{P \times Y}{M}$$

$$\text{Equation of Exchange: } M \times V = P \times Y$$

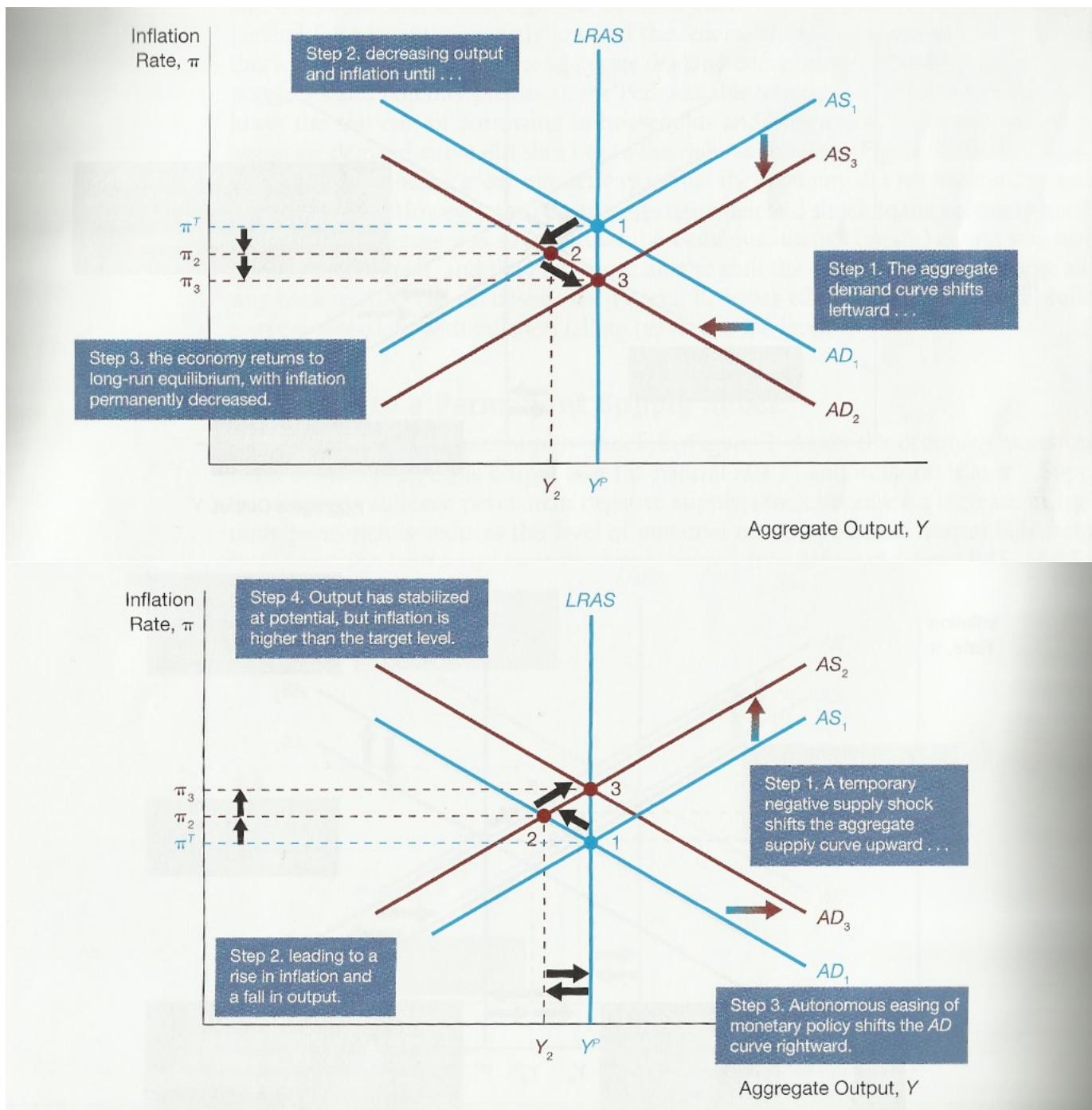
### Factors That Determine the Demand for Money

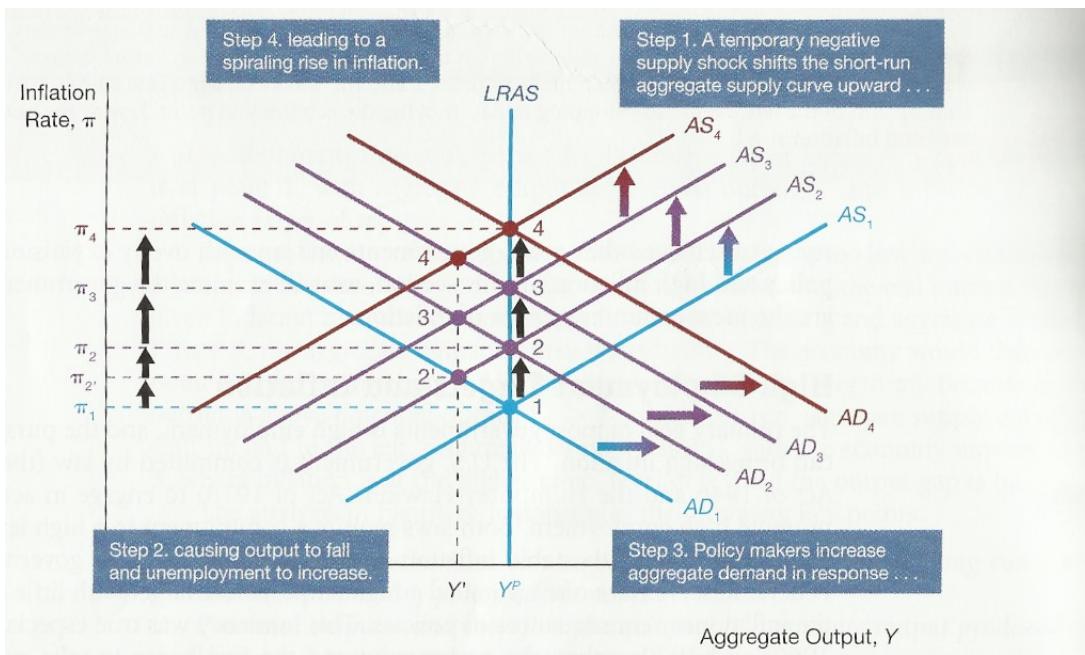
Variable	Change in Variable	Money Demand Response	Reason
Interest rates	↑	↓	Opportunity cost of money rises
Income	↑	↑	Higher transactions
Payment technology	↑	↓	Less need for money in transactions
Wealth	↑	↑	More resources to put into money
Risk of other assets	↑	↑	Money relatively less risky and so more desirable
Inflation risk	↑	↓	Money relatively more risky and so less desirable
Liquidity of other assets	↑	↓	Money relatively less liquid and so less desirable

## Chapter 21: The IS curve



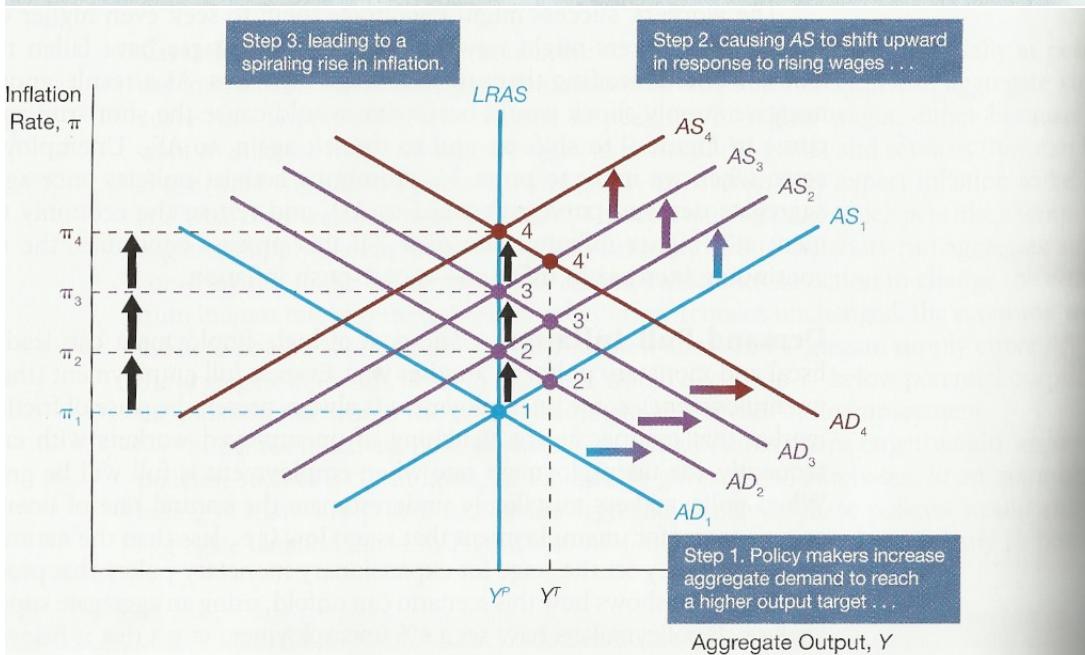
# Chapter 24: Monetary Policy Theory





### Cost-Push Inflation

A cost-push shock (which acts like a temporary negative supply shock) shifts the short-run aggregate supply curve up and to the left to  $AS_2$ , and the economy moves to point 2'. To keep aggregate output at  $Y^P$  and lower the unemployment rate, policymakers shift the aggregate demand curve to  $AD_2$  so that the economy will return quickly to potential output at point 2 and an inflation rate of  $\pi_2$ . Further upward and leftward shifts of the short-run aggregate supply curve to  $AS_3$  and so on cause the policymakers to keep on increasing aggregate demand, leading to a continuing increase in inflation—a cost-push inflation.



### Demand-Pull Inflation

Too low an unemployment target (too high an output target of  $Y^T$ ) causes the government to increase aggregate demand, shifting the  $AD$  curve rightward from  $AD_1$  to  $AD_2$  to  $AD_3$  and so on. Because the unemployment rate is below the natural rate level, wages will rise and the short-run aggregate supply curve will shift up and leftward from  $AS_1$  to  $AS_2$  to  $AS_3$  and so on. The result is a continuing rise in inflation known as a demand-pull inflation.

definitely lots of marks here

# Chapter 25: The role of expectations in monetary policy

# Chapter 26: Transmission mechanism of monetary policy

