

**ECS301 [New ECS3701]
SELECTED EXAMINATION QUESTIONS AND SUGGESTED
SOLUTIONS**

MAY/JUNE 2011

Part 1: Definition and functions of money (15 Marks)

Answer all questions in part 1.

1.1 List and explain the three primary functions of money. (2)

Medium of Exchange: money serves as a medium of exchange allowing it to be used as payment for goods and services. As such it promotes economic efficiency by reducing the time taken for transactions to take place.

Unit of Account: used to measure value of goods and services in an economy and helps to reduce transaction costs.

Store of Value: serves as a store of purchasing power from the time the income is earned to the time it is spent.

1.2 What is the difference between primary and secondary financial markets: (2)

Primary and Secondary markets: Primary market is the market in which financial instruments are issued, while the secondary market is the market in which financial instruments are traded.

1.3 What is fiat money? (3)

Fiat Money: paper currency decreed by government as legal tender. It is largely dependent upon trust of the value of the currency.

1.4 How is the M2 money stock measured in South Africa? List ALL the components. (4)

M2 consists of M1 plus deposits which are almost money. Apart from coins, banknotes and demand deposits it also includes short-term and

medium-term deposits held by the private domestic sector at monetary institutions, commercial banks and savings institutions.

Part 2: Financial markets (20 Marks)

Answer question 2.1.

2.1

- (i) **Explain the difference between the yield to maturity of a bond and the return on a bond. Please provide the relevant formulas to substantiate your answer. (5)**

Yield to Maturity: of the several common ways to calculate interest rates, the most important is the yield to maturity. The key to calculating the yield to maturity for any credit market instrument, is to equate today's value of the credit instrument with the present value (PV) of all of its future cash flow payments. The bond price and the yield to maturity are negatively related.

The formula used to calculate the yield to maturity depends upon the specific credit instrument being considered. In this case the yield to maturity on a bond, refer to the formula in the textbook.

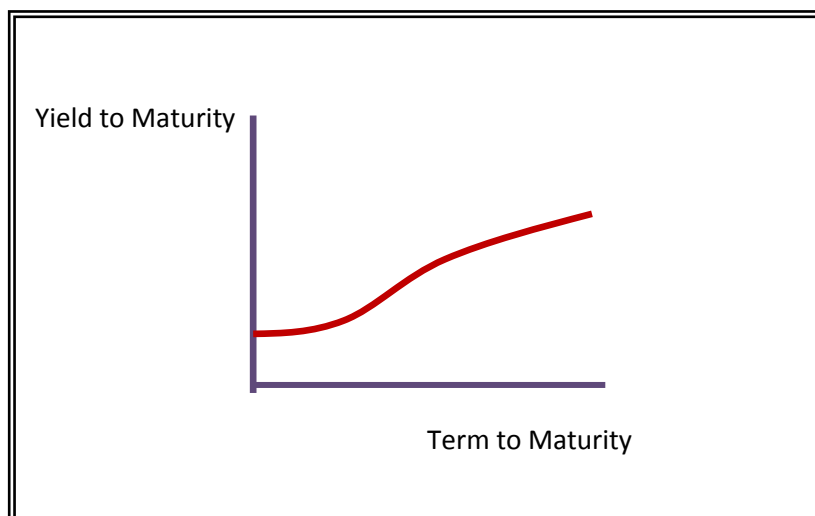
$$[P = C/(1 + i) + C/(1 + i)^2 \dots\dots\dots C/(1 + i)^n + F/(1 + i)^n]$$

The return on a security shows how well you have done by holding this security over a stated period of time and it can differ substantially from the interest rate measured by the yield to maturity. The rate of return is defined as the payments to the owner plus the change in its value expressed as a fraction of its purchase price. Because of fluctuating interest rates, the capital gains and losses on long-term bonds can be large.

- (ii) **Provide a definition for the yield curve and draw a normal yield curve. Please clearly label your graph and axes. (5)**

When the yields on bonds with differing terms to maturity but the same risk, liquidity and tax considerations are plotted on a graph, this is called a yield curve. Normal yield curves are upward-sloping and this means that the long-term interest rates are above the short-term interest rates.

A normal yield curve:



Answer **any one** of the following two questions :

2.2 Use the theory of asset demand to explain how both (i) and (ii) below will influence the supply of and demand for bonds, the price of bonds and the equilibrium quantity of bonds. (Please answer each question separately.)

(i) Higher expected future interest rates. (4)

The interaction of supply and demand for bonds is one of the ways in which interest rates are determined. If it is expected that interest rates will rise in the future, then the demand for bonds will decrease and the demand curve for bonds will shift to the left. This is because the increasing interest rate implies a decreasing price and therefore the expectation of lower returns. The equilibrium price and quantity of bonds will decrease, *ceteris paribus*.

(ii) An increase in the expected inflation rate (6)

When inflation is expected to rise it lowers the expected return on bonds and so demand will decrease. The returns on other assets tend to increase in times of inflation and therefore bonds become less attractive.

An increase in expected inflation also impacts on the supply of bonds. For a given interest rate, when the expected inflation increases, the real cost of borrowing falls and so the quantity of bonds supplied will increase.

The overall impact of the above on the price and quantity of bonds is that the equilibrium price of bonds will decrease (and interest rates will rise), but the effect on the quantity of bonds is uncertain.

2.3 Explain the assumptions and predictions of the expectations theory and how well it explains the three empirical observations of the yield curve. (Hint: Write down the formula for the long term interest rate). (10)

Expectations theory: the interest rate on a long-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 behind this theory 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. The expectations theory is able to explain empirical facts (1) and (2) but is unable to explain fact (3).

The three empirical facts are:

- Interest rates on bonds of differing maturities move together over time. [A rise in short-term rates (STR) will raise people's expectations of future short-term rates. Because long-term rates (LTR) are the average of expected future short-term rates, the rise in STRs will lead to rise in LTRs causing LTRs and STRs to move together.]
- When short-term interest rates are low, yield curves are more likely to have an upward slope; when short-term rate are high, yield curves are more likely to slope downwards and be inverted. [When STRs are high people will generally expect them to fall in the future and so LTRs will be lower than STRs because the average of expected future STRs would be lower than current STRs and the yield curve slopes downwards.]
- Yield curves almost always slope upward. [Expectations theory suggests that the typical yield curve should be flat rather than upward sloping]

Part 3: Financial institutions (15 marks)

Answer question 3.1.

3.1

- (i) Explain in detail the difference between adverse selection and moral hazard. Provide an example of each to substantiate your answer. (5)**

Adverse selection occurs before the transaction takes place. Because of asymmetric information it is difficult to make a decision on who to lend to and if a bank finds that it has insufficient information on which to make a good decision it might decide not to grant loans to anyone, even those who would be able to pay the loans back.

Moral hazard occurs after the transaction has taken place. For example if the bank decides an individual or firm is a worthy credit risk and extends the required credit. If the firm or individual do not use the funds for the reasons they specified to the bank and perhaps are reckless or negligent and then get into financial trouble as a result, this would be moral hazard.

(ii) Explain what is collateral and why it is important in debt contracts (3)

Collateral is property that is pledged to the lender to guarantee payment in the event that the borrower is unable to make debt repayments. In the case of debt contracts, even if a borrower defaults the value of the assets held as collateral would be able to cover the amounts that are owing. The fact that the borrower might have to give up valuable assets tends to reduce the moral hazard in debt contracts.

(iii) List two types of restrictive covenants which could appear in debt contracts. (2)

Any two of: covenants to discourage undesirable behaviour; covenants to encourage desirable behaviour; covenants to keep collateral valuable; covenants to provide information.

Answer **any one** of the following two questions:

3.2 List five of the major items which appear on the balance sheet of a commercial bank, classified according to assets and liabilities. (5)

Assets	Liabilities
Reserves	Deposits
Securities	Borrowing of banks
Loans	Capital

OR

3.3 Briefly explain the meaning of credit risk and discuss two possible strategies for banks to manage it. (5)

Credit risk is the risk arising from the possibility that borrowers may default on the repayment of loans. To be profitable, financial institutions must overcome the adverse selection and moral hazard problems that make loan default more likely. There are a number of ways they can do this:

- **Screening and monitoring:** adverse selection in loan markets requires that lenders screen out the bad credit risks from the good ones so that loans are profitable. Lenders must, therefore, collect reliable information from prospective borrowers. Effective screening and information collection together form an important principle of credit risk management. Banks often specialize in lending to firms in a particular industry. This goes against the idea of diversification but at the same time makes some sense. By concentrating on leading firms in a specific industry the bank becomes knowledgeable about that specific industry and is better able to make informed decisions. Once a loan has been made there is still the risk of moral hazard. In order to reduce the likelihood of this occurring, financial institutions should adhere to the principle of managing credit risk and write provisions (restrictive covenants) into loan contracts that restrict borrowers from engaging in risky activities.
- **Long-term customer relationships:** such relationships reduce the costs of collecting information and make it easier to screen out bad credit risks. This has the added advantage of the customer wishing to ensure that he/she can preserve a good relationship with the bank for future loan requirements and so reduces the chances of the customer doing anything to jeopardize the situation.
- **Loan commitments:** an agreement between the bank and a firm to grant loan requirements up to an agreed amount at an interest rate that is linked to a market rate. The advantage to the firm is a secure source of credit and to the bank a long-term relationship which facilitates the collection of information.
- **Collateral and compensating balance:** collateral requirements are important credit risk management tools. One particular form of collateral required by a bank when it makes a commercial loan, is called compensating balances: a firm receiving the loan must keep a required minimum amount of funds in a chequing account with

the bank. This helps the bank to monitor the client and reduce the risk of moral hazard.

- Credit rationing: refusing to make loans even though customers are willing to pay the required interest rate. There are two forms: (i) refusal to make any loan and (ii) restricting the size of the loans made.

Part 4: Central banking and the conduct of monetary policy (25 Marks)

Answer **EITHER** question 4.1 or 4.2.

4.1

(i) The money multiplier equation is given by:

$$M = [1 + c]/[r + e + c] \text{ (MB)}$$

What do the variables r , e and c represent? What will be the effect of an increase in r on the multiplier? (5)

r : the required reserve ratio. The required reserve ratio is the percentage of liabilities that all banks are required to keep in an account with the central bank. The required reserve ratio is set by the central bank at less than 1 and the level of required reserves can be stated as $r \times D$. When the required reserve ratio increases then multiple deposit expansion falls.

e : this represents the portion of all demand deposits (D) that banks choose to hold as excess reserves (ER). This is voluntary and is not prescribed by the central bank. When banks choose to increase e then multiple deposit expansion falls.

c : represents the currency ratio and indicates the portion of all demand deposits (D) that people choose to hold in the form of currency ($c \times D$). When individuals convert demand deposits into currency, holding the monetary base and other variables constant, the multiple expansion declines and money supply falls.

- (ii) With reference to the bank panics in the USA during the Great Depression (1930 – 1933), explain briefly the reasons why the variables c and e in the money multiplier equation changed during this period, and how these led to a contraction in the money supply.**

During the bank panics in the USA during the 1930s when a bank failed depositors would only receive a portion of their deposits. Depositors therefore shifted their holdings from demand deposits to cash holdings. This means that there was an increase in c . The increased withdrawals meant that banks were forced to increase their excess reserves in order to meet the outflows and so e also increased.

The impact of this on the money supply: as c and e continued to rise the money supply declined. This decline occurred despite a 20% rise in the monetary base. This illustrates the fact that the central bank's job of conducting monetary policy can be complicated by depositor and bank behaviour.

4.2

- (i) List the five elements of inflation targeting. (5)**

- (1) public announcement of medium term numerical targets for inflation;
- (2) an institutional commitment to price stability as the primary, long-run goal of monetary policy and a commitment to achieve the inflation goal;
- (3) an information-inclusive approach in which many variables are used in making decisions about monetary policy;
- (4) increased transparency of monetary policy strategy through communication with the public and the markets about the plans and objectives of monetary policymakers;
- (5) increased accountability of the central bank for attaining its inflation objectives.

- (ii) Give five advantages of inflation targeting (5).**

- Allows the monetary authorities to use all available information, not just one variable, to determine the best settings for monetary policy.
- It is readily understood by the public and highly transparent.
- It has the likelihood of reducing the problem of time-inconsistency of central bank trying to increase output and employment in the short run.
- It helps focus the political debate on what a central bank can do in the long run (control inflation).

- Encourages frequent communication with the public.

Answer **EITHER** question 4.3 or 4.4:

4.3 Explain the South African Reserve Bank's Accommodation Policy in detail. In your answer, discuss the role of open market operations and liquidity shortages, the repo rate and repo auctions. (15)

In the broadest sense, accommodation granted by a central bank refers to the forms of credit extension made available by a central bank to parties in the economy, which includes banks. Through its refinancing or accommodation policy, the South African Reserve Bank (SARB) provides liquidity to the banks and so enables them to meet their daily liquidity requirements. This refinancing system of the SARB is the main mechanism it uses for implementing monetary policy.

The main facility for refinancing the liquidity requirement is the weekly repurchase transactions between the SARB and the commercial banks which take place through repo auctions. At these auctions, held on Wednesdays, the SARB invites tenders for its refinancing auction. Through this mechanism the SARB provides liquidity to the banks by means of repurchase agreements (repos) involving mainly government bonds, treasury bills, SARB debentures and Land bank bills. Banks sell these securities to the SARB for a period of one week, in return for reserves. Banks pay the repo interest rate on these reserves.

SARB conducts its open market operations (OMOs) in such a way that it ensures that the banks do not obtain all the reserves they need to meet their reserve requirements. The aim is to force the banks to supplement their reserves by seeking to borrow (borrowed reserves) from SARB at the repo rate. Because SARB meets all these requests unconditionally, the interest rate it sets (the repo rate) becomes the pivotal rate that dominates the interbank cash funds rate and ultimately the rate banks charge their borrowers.

Once SARB has estimated the banks' overall liquidity requirements, it offers various securities and maturities on auction at varying interest rates. The bulk of the OMOs currently consist of transactions in long-term government stock. In the case of an OMO sale, the central bank sells bonds to the banks and thereby removes money from the economy and so the liquidity deficit increases.

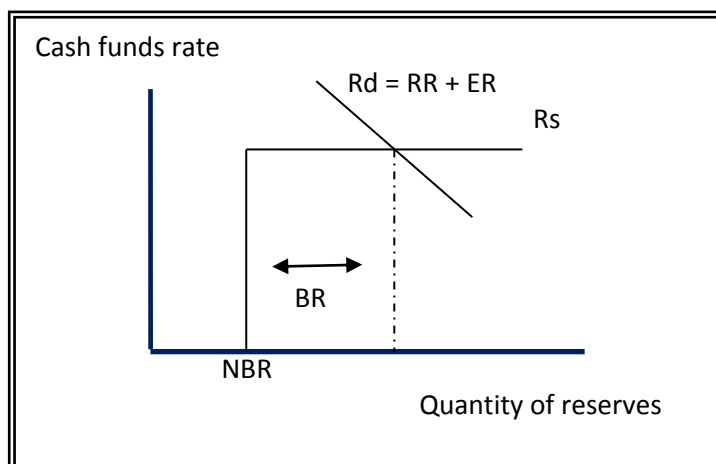
4.4 Explain and graphically illustrate how the market for bank reserves functions in South Africa. (Hint: Explain each of the curves (and its components), the point of equilibrium and how the SARB in principle conducts its monetary policy). (15)

The South African Reserve Bank manipulates the volume of borrowed reserves required by the banks through its open market operations. This in turn impacts on the demand for reserves by the banks. SARB conducts its open market operations in such a way that it ensures that the banks do not obtain all the reserves they need to meet their reserve requirements. The aim is to force the banks to supplement their reserves by seeking discount loans from SARB. SARB meets all these loan requests unconditionally and the interest rate (repo rate) it sets there becomes the pivotal rate that dominates the interbank cash funds rate and ultimately the rate banks charge their borrowers. This is how monetary policy action is transmitted to the real economy.

The market for reserves in South Africa forms the basis for monetary policy formulation. The diagram below illustrates the market for reserves in SA:

- The vertical axis shows the cash funds rate (repo rate)
- R_d represents the demand for borrowed reserve and is downward sloping indicating an inverse relationship between the cash funds rate and the quantity of reserves demanded.
- R_s curve represents the supply of reserves (non-borrowed (NBR) and borrowed (BR)). The vertical part of the supply curve indicates the quantity of NBR (independent of the cash funds rate. The horizontal part of the supply curve shows that the supply of BR at the prevailing repo rate is perfectly elastic.
- The interest rate (specific cash funds rate, repo rate, discount rate) is determined by the SARB. The banks then base their other interest rates on this benchmark rate.
- The point of intersection between the R_d and R_s represents a point of equilibrium in the market for reserves and indicates the quantity of reserves demanded at the prevailing interest rate.

Diagram: refer to study guide



Part 5: International Finance

NO QUESTIONS

Part 6: Monetary theory (25 Marks)

Answer EITHER question 6.1 or question 6.2:

- 6.1 Explain why the ISLM model may be regarded as unrealistic. Focus particularly on the interpretations of endogenous and exogenous variables within the ISLM model and on how the money supply is determined in South Africa. Which additional assumption regarding the LM curve would improve the relevance of the ISLM model for monetary policy in South Africa? (10)**

Refer question 6.2 for Oct/Nov 2009

- 6.2 Explain why Keynes's liquidity preference theory predicts that both nominal income and interest rates affect the demand for money. (Hint: start with Keynes' liquidity preference function).**

Refer 6.1 in May/June 2010 paper

Answer EITHER question 6.3 or questions 6.4:

6.3 Assume that at an MPC meeting the South African Reserve Bank decides to lower the repo rate. What will the impact of a lower repo rate be on real production (Y) and prices (P)? Motivate your answer by discussing both the interest rate transmission channel as well as the asset price transmission channel in the South African context. (15)

When SARB changes the repo rate, it sets in motion a chain of economic events. Economists refer to this as the “transmission mechanism of monetary policy”. The main links of the transmission mechanism of monetary policy are: (i) interest rates; (ii) prices of other financial assets; (iii) credit channel

Interest rate channel: if the repo rate is decreased this will cause all interest rates to decrease. A decrease in interest rate leads to an increase in Investment spending (real fixed capital formation). Firms and households alter their investment and spending patterns and this will lead to an increase in aggregate demand. Real output (Y) will respond. Demand pressures can lead to an increase in prices (P).

Asset price transmission channel: when SA real interest rates fall it can influence exchange rates and the prices of other assets. The following chains of events illustrate how this occurs:

- Repo rate↓→ interest rate↓→ exchange rate↓→ net exports↑→ output↑
Exchange rate↑→ cost of import↑→ price↑
- Repo rate↓→ equity prices↑→ investment↑→ output↑
- Repo rate↓→ price on equity, property land ↑→ consumption spending↑→ output↑

6.4 Provide a definition of inflation. Specifically refer to the difference between an inflationary impulse and an inflationary spiral initiated by an initial increase in the price of a good. Also explain the role of inflation expectations. (15)

Inflation can be defined as a sustained and considerable increase in general prices, whereby price increases lead to further price increases.

A once-off rise in the price of a single good is what may be called an inflationary impulse. An inflationary impulse does not constitute inflation. Whether or not inflation does result from such an inflationary impulse depends on the reaction of other agents to this price increase. For example an increase in the price of petrol can act an inflationary impulse and if the prices of most other goods and services then also increase, this would be called an inflationary spiral.

The following describes how inflation might occur in an economy:

- Assume a market price increases
- Suppliers raise their claims on real wealth at the expense of demanders.
- If demanders react to these losses by passing the price increases on to other demanders (their customers) then price increases feed on themselves and total income claims keep on running ahead of total real wealth creation at existing prices.

Inflationary impulses can be a matter of either cost-push or demand-pull, inflationary spirals are a matter of cost-push only.

The expectations of inflation tend to give rise to inflation. If workers, suppliers and consumers expect inflation all pricing decisions will be made based on expected increases in prices and this will end up being a self-fulfilling prophecy. For this reason, one of the ways of combating inflation is for monetary authorities to persuade business to revise their inflationary expectations downwards.

MAY/JUNE 2010

PART 1

All the questions in this section are theoretical questions and the answers are in the textbook.

PART 2

2.1 Explain the difference between the yield to maturity of a bond and the return on a bond. Show the relevant formulas applicable to a two year coupon bond to substantiate your answer. [5]

Refer to the solution for May/June 2011 question 2.1.

2.2 Write down and explain the meaning of the Fisher equation. [5]

Fisher's original quantity equation was $MV = PT$, where

M = quantity of money

V = velocity of money (average number of times that a unit of currency (\$1) is spent in a year)

P = price level

T = transactions in all goods and services, original factors, unfinished goods and components, financial assets and second-hand goods (mostly real estate).

The equation is simply an identity that links the total amount of money in an economy with the total amount of economic activity (Y). Mishkin gives the quantity equation as $MV = PY$ which implicitly implies that Y is a reliable approximation for T.

2.3 Explain why the price of a bond and its interest rate (yield to maturity) are inversely related. Use a one year discount bond with a face value (F) of R1000 as an example. [5]

Assume that the price paid for the bond is R900: the interest rate would be $(R1000 - R900) \div 900 = 11.11\%$;

Assume that the price paid for the bond is R800: the interest rate would be $(R1000 - R800) \div R800 = 25\%$

Assume that the price paid for the bond is R950: the interest rate would be $(R1000 - R950) \div R950 = 5.26\%$

From the above it can be seen that when the price of the bond increases the interest rate decreases and when the price of the bond decreases then the interest rate increases. There is an inverse relationship between the price of the bond and the interest rate. This can be explained by the fact that a rise in the interest rate (coupon payment) on a bond implies that the future coupon payments and final payment are worth less when discounted back to the present.

2.4 Use the theory of asset demand to explain how a business cycle expansion will influence the supply and demand of bonds, the price of bonds and the equilibrium interest rate. [10]

[Note that the theory of asset demand is the same as the theory of portfolio choice (Chapter 5).] People may choose to hold assets because they can act as a store of value. The theory of asset demand explains how much of

an asset people want to hold in their portfolios and identifies the criteria that are important when making this decision. Some of the criteria that are applicable are wealth, expected return, risk and liquidity. The demand for two assets in particular, bonds and money, are important factors in determining the interest rates in an economy. Consequently the way in which the demand and supply of bonds is affected by changes in any of the criteria mentioned above will impact on the equilibrium interest rate.

In a business cycle expansion the amount of goods and services produced increases and this means that national income increases. Business will be more willing to borrow and so at a given bond price, the quantity of bonds that a firm will want to sell will increase. This is illustrated by a rightward shift of the supply curve for bonds.

As the business cycle expands and incomes increase, wealth will increase and the demand for bonds will also increase. This is illustrated by rightward shift of the supply curve.

Explain what happens to the equilibrium price and quantity (you may use a diagram to aid your explanation). Note the uncertain outcome regarding interest rates.

2.5 **State the liquidity premium theory of the term structure and explain how well this theory explains the three empirical observations of the yield curve. [10]**

The three empirical observations are:

- Interest rates on bonds of differing maturities move together over time.
- When short-term interest rates are low, yield curves are more likely to have an upward slope; when short-term rate are high, yield curves are more likely to slope downwards and be inverted.
- Yield curves almost always slope upward.

Liquidity premium theory (preferred): this theory states that 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 that responds to supply and demand conditions for that bond. The **key assumption** is that bonds of different maturities are substitutes, which means that the expected return on one bond does influence the expected return on a bond of a different maturity, but it allows investors to

prefer one bond maturity over another. Investors tend to prefer shorter-term bonds because of less interest-rate risk and so investors must be offered a liquidity premium to induce them to hold longer-term bonds. [When short-term rates rise, long-term rates will also tend to rise. This also explains why yield curves tend to have an especially steep upward slope when SR rates are low and to be inverted when SR rates are high.]

The liquidity premium and closely related preferred habitat theories combined the features of the expectations theory and the segmented market theory and are then able to explain all three facts relating to yield curves. They view long-term interest rates as equalling the average of future short-term rates expected to occur over the life of the bond plus a liquidity premium.

Part 3: Financial Institutions

3.1 Explain the difference between adverse selection and moral hazard. Provide an example of each to substantiate your answer. [5]

Refer to the solution for 3.1 in the May/June 2011 paper.

3.2 The Great Depression was probably the worst financial crisis the world has ever seen. Define a financial crisis and discuss three of the six categories of factors that could cause a financial crisis. [10]

A financial crisis occurs when an increase in asymmetric information from a disruption in the financial system causes severe adverse selection and moral hazard problems that render financial markets incapable of channelling funds efficiently from savers to households and firms with productive investment opportunities. When financial markets fail to function efficiently, economic activity contracts sharply.

Any three of the following:

- **Asset market effects on balance sheets:**
Stock market decline leads to a deterioration in balance sheets. This in turn gives rise to an increase in adverse selection and moral hazard problems in the financial markets and can provoke a crisis. Unanticipated decline in the price levels can decrease the net worth of firms by raising the real value of debt but not assets. [The reverse of inflation]. Unanticipated decline in the value of the domestic currency when debts are in foreign currency can lead to

an increase in debt levels. Asset write-downs lead to a decrease in the value of assets.

- **Deterioration in financial institutions' balance sheets:** a deterioration in a bank's balance sheet will lead to a serious contraction in capital and limit a bank's ability to make loans. This has a negative effect on both investment and consumption spending.
- **Banking crisis:** when the deterioration of a bank's balance sheet is very severe it can cause the bank to fail. This leads to bank panic. The source of the contagion is asymmetric information.
- **Increases in uncertainty:** dramatic increase in uncertainty as to which institutions are stable makes it difficult for lenders to solve the adverse selection problem making them less willing to lend. This leads to a decrease in investment and aggregate economic activity.
- **Increases in interest rates:** play a role in promoting a financial crisis through their effect on cash flow and the problems of adverse selection and moral hazard become worse.
- **Government fiscal imbalance:** fears of default by governments make investors unwilling to purchase government bonds. In order to raise finance governments might force financial institutions to buy the bonds. Such actions will place the financial institutions under pressure and can provoke a financial crisis.

3.3 Banks and other financial institutions are faced with two major risks in their day-to-day operations: credit risk and interest rate risk. Explain the meaning of credit risk and discuss four possible strategies that a bank might follow to manage credit risk. [10]

Refer May/June 2011 question 3.3

Part 4: Central banking and the conduct of monetary policy

4.1 Derive the money multiplier equation. Also explain what the variables (M and MB; r, e and c) represent. [10]

Derivation of the money multiplier equation:

- Use the simple definition of money ($M1 = C + D$)
- Linking relationship: $M = m \times MB$, where M = money supply and MB is the monetary base; m is the money multiplier
- It is assumed that the desired level of currency (C) and excess reserves (ER) grows proportionally with demand deposits (D):
 - $c = C/D$ = currency ratio
 - $e = ER/D$ = excess reserves ratio
- Total amount of reserves in the banking system (R) is the sum of required reserves (RR) and excess reserves (ER)
 - Possible to state the total amount of required reserves: as

$$R = RR + ER \text{ and}$$
 - $RR = r \times D$ [r will be less than 1]
 - So, $R = (r \times D) + ER$
- Remember that $MB = C + R$, so now it is possible to derive an equation that links the amount of the monetary base to the levels of D and C :
 - $MB = C + R = C + (r \times D) + ER$
- **An important feature of this equation is that an additional dollar of C does not support an increase in D . An increase in the monetary base that is only in currency is not multiplied, whereas an increase that goes into deposits is multiplied.**
- Now derive the money multiplier in terms of the currency and excess reserve ratios as a portion of demand deposits:
 - $MB = (r \times D) + (e \times D) + (c \times D) = (r + e + c) \times D$
- Using the above equation write down the expression that links demand deposits D to the monetary base MB :

$$D = 1/(r + e + c) \times MB$$

- $M1 = C + D = (c \times D) + D = (1 + c)D$ and $D = 1/(r + e + c) \times MB$
- Substitute into equation: $M = mMB$: $M = (1 + c)/(r + e + c) \times MB$
- The money multiplier is m :

$$m = \frac{1 + c}{r + e + c}$$

4.2 **The South African Reserve Bank is seen as a relatively independent institution. Discuss the general case for, and against, central bank independence.** [10]

The following are points to consider **supporting the case for independence**:

A strong argument that supports independence is that subjecting a central bank to political pressures would cause an inflationary bias to monetary policy

- Because politicians tend to be motivated by self-interest (i.e. election) they are inclined to be short-sighted in regard to objectives. They are inclined to focus on finding short-term, popular solutions which may not have good long-term outcomes.
- An example: high money growth in the short run might lead to a drop in interest rates, but ultimately, as inflation heats up, will cause interest rates to rise.
- It is believed that a politically insulated (independent) central bank is more likely to be concerned with long-term objectives, such as a sound currency and stable price level.
- The political business cycle is also a reason for keeping the central bank independent. Expansionary policies are generally followed immediately prior to elections, and the bad consequences are only felt afterwards.
- The control of monetary policy is too important to leave to politicians. This can be stated in terms of the principal-agent problem. It is argued though that the principal –agent problem is worse for politicians than for the Fed.
- An independent central bank can pursue policies that may not be popular, but are in the public interest.

The following are the points to consider when arguing **the case against independence**:

- Control of monetary policy by an elite group who is answerable to no-one is considered undemocratic
- The current lack of accountability is a problem.
- In arguing for the independence of the central bank, it is then possible to also argue for the independence of other government organisations such as SARS.
- The public holds the president and Congress (in the USA) responsible for the economic well-being of the country but lacks the control over a very important element in determining the health of the economy.

- In order to achieve economic stability, monetary policy must be coordinated with fiscal policy.

Recent research seems to support the idea that the central bank should be independent: when central banks are ranked from least independent to most independent, inflation performance is found to be the best for countries with the most independent central banks. In addition countries with independent central banks are no more likely to have high unemployment or greater output fluctuations than those with less independent central banks.

The central bank in South Africa, SARB, has operational independence but not goal independence. The goals are set in conjunction with the government (Treasury) and SARB is accountable to Parliament (the people of South Africa).

4.3 Explain the South African Reserve Bank's accommodation policy in detail. In your answer, discuss the role of open market operations and liquidity shortages, the repo rate and repo auctions. [15]

Refer May/June 2011, question 4.3

4.4 List the five elements of inflation targeting. Also explain the advantages and disadvantages of inflation targeting. [15]

Inflation targeting involves several elements: (1) public announcement of medium term numerical targets for inflation; (2) an institutional commitment to price stability as the primary, long-run goal of monetary policy and a commitment to achieve the inflation goal; (3) an information-inclusive approach in which many variables are used in making decisions about monetary policy; (4) increased transparency of monetary policy strategy through communication with the public and the markets about the plans and objectives of monetary policymakers; (5) increased accountability of the central bank for attaining its inflation objectives.

Advantages of inflation targeting:

- Allows the monetary authorities to use all available information, not just one variable, to determine the best settings for monetary policy.
- It is readily understood by the public and highly transparent.
- It has the likelihood of reducing the problem of time-inconsistency of central bank trying to increase output and employment in the short run.

- It helps focus the political debate on what a central bank can do in the long run (control inflation).
- Encourages frequent communication with the public.

Disadvantages of inflation targeting (be sure you are able to describe each of the following):

- Delayed signals
- Too much rigidity
- Potential for increased output fluctuations
- Low economic growth

Part 6: Monetary theory

6.1 Explain why Keynes's liquidity preference theory predicts that both nominal income and interest rates affect the demand for money. [10]

Keynes' view was a major departure from Fisher's (interest has no effect on demand for money). Keynes' liquidity preference theory "postulated three motives for holding money, the transaction motive, the precautionary motive and the speculative motive. Although Keynes took the transactions and precautionary motives to be proportional to income, he reasoned that the speculative motive would be negatively related to the level of interest rates.

- By putting all three motives together Keynes was able to develop a demand for money equation.
- He distinguished between nominal and real quantities. Money is valued in terms of what it can buy.
- Keynes reasoned that people want to hold a certain amount of real money balances which would be related to income (Y) and interest rates (i): $Md/P = f(Y, i)$ [liquidity preference function].
- The above function can be explained as follows: the demand for real money balances Md/P is a function of i and Y .
- Keynes' model has an important implication: velocity is not constant and is in fact positively related to interest rates. His liquidity preference theory casts doubt on the classical quantity theory that nominal income is determined primarily by movements in the quantity of money.

6.2 **Briefly explain the Quantity theory of money (QT) by referring specifically to its assumptions and predictions. Also demonstrate that the QT can be transformed into a quantity theory of money demand. Does the assumption regarding the velocity of money (V) agree with its empirical analysis in most countries? [10]**

Equation of exchange is simply an identity. It does not tell us that when the money supply, M changes, nominal income ($P \times Y$) changes in the same direction. In fact the identity leads to the argument that an increase in M would be offset by a decrease in V which leaves $M \times V$ and therefore $P \times Y$ unchanged.

The identity has to be **converted into a theory** of how nominal income is determined.

Fisher's view that velocity is fairly constant in the short run, transforms the equation of exchange into the QUANTITY THEORY OF MONEY. This theory states that nominal income is determined solely by movements in the quantity of money: when M doubles, $M \times V$ doubles and so must $P \times Y$.

Classical economists believed that wages and prices were completely flexible (assumption) and that aggregate output (Y) would remain at full-employment level.

The quantity theory (QT) implies that if M doubles then P must double because Y and V are constant.

They believed that any change in M would lead to a change in the price level.

Movements in the price level resulted solely from changes in the quantity of money.

This theory implicitly assumed that the causal direction in the quantity equation runs from MV to PY .

Because the QT tells how much money is held for a given amount of aggregate income, it is considered to be a theory of the demand for money. Fisher's QT suggests that the demand for money is purely a function of income, and interest rates have no effect on the demand for money.

Empirical data has shown that velocity of money is not constant. V may be defined in two ways:

- $V = PY/M$ [$MV = PY$] and this is referred to as "income velocity of circulation".
- $V = PT/M$ [$MV = PT$] and is referred to as "transaction velocity of circulation".

- The transaction velocity measures the average number of times a given amount of money is spent over a given period. It reflects the number of transactions that need to take place for a given amount of finished output (Y) to be produced.

6.3 Assume that at an MPC meeting the South African Reserve Bank decides to lower the repo rate. What will be the impact of a lower repo rate on real production (Y) and prices (P). Motivate your answer by discussing both the interest rate and credit transmission channels in the South African context. [15]

When SARB changes the repo rate, it sets in motion a chain of economic events. Economists refer to this as the “transmission mechanism of monetary policy”. The main links of the transmission mechanism of monetary policy are: (i) interest rates; (ii) prices of other financial assets; (iii) credit channel

Interest rate channel: if the repo rate is decreased this will cause all interest rates to decrease. A decrease in interest rate leads to an increase in Investment spending (real fixed capital formation). Firms and households alter their investment and spending patterns. Real output (Y) will respond. Demand pressures can lead to an increase in prices (P).

Credit channel: this channel operates through bank lending. A decrease in the repo rate is expansionary monetary policy. This leads to an increase in bank reserves and bank deposits, thus increasing the amount of loans available. This increase in loans will cause fixed capital formation and consumer spending to rise. A significant implication is that monetary policy through this channel will have a greater effect on those more reliant on bank loans, such as smaller firms.

Credit also affects the balance sheets of households and firms. The higher net worth of firms and households from increased economic activity, leads to an increase in collateral available for loans and the banks’ potential losses from adverse selection decreases. The links are: decrease in the repo rate leads to an increase in price expectations and therefore an increase in cashflows. This in turn leads to a decrease in adverse select and moral hazard problems, an increase in lending, an increase in consumption spending (C) and an increase in output (Y).

6.4 Some observers believe that a more relaxed monetary policy (i.e. a lower repo rate) could boost economic growth and job creation. On the other hand, relaxing monetary policy could lead to higher inflation. Critically discuss the impact of higher inflation on productivity and on the distribution of income. [15]

If Milton Friedman is to be believed then “inflation is always and everywhere a monetary phenomenon”. This is correct insofar as it points to the fact that persistent price increases require an increase in the total money stock if the volume of transactions is not to shrink. However, it is not correct in implying that inflation is only caused by increased aggregate demand which can be brought about by expansionary monetary policy (lower repo rate). Cost factors can also lead to inflation (cost-push). Inflation is defined as a continuation of price increases whereby these increases feed on themselves.

Inflation damages real productivity when it turns economic agents away from productive activity and productive investment. There are three reasons for this: (i) productive investment of money and effort is discouraged because inflation adds an extra source of uncertainty to estimates of future profitability underlying investment decisions; (ii) inflation means that changes in nominal prices no longer reflect changes in relative prices. It distorts relative prices and adds to an atmosphere of instability and pessimism which discourages investment; (iii) inflation causes people to divert their effort and capital away from productive enterprise towards non-productive investment merely to protect the real value of their wealth.

Inflation has an adverse effect on income distribution. There are four main categories of people whose real income is negatively affected by inflation: (i) those who lack the bargaining power to increase their nominal incomes in accordance with the inflation rate; (ii) those people who hold money which loses value during times of high inflation; (iii) creditors are repaid in money units of lower purchasing power; (iv) through bracket creep everyone who pays taxes is affected. Higher nominal incomes force people into higher tax brackets.

An inflation rate that is higher than our main trading partners can also discourage foreign investment because the exchange rate will fall steadily. The return on investment must make up for this loss.

OCT/NOV 2009

Part 1: Definition and functions of money

Answer all questions in part 1:

1.1 Briefly distinguish between money and income. (2)

Economists define money as anything that is generally accepted in payment for goods and services or in repayment of debts. Money does not mean the same as wealth or income.

Income is the flow of earnings over a period of time.

1.3 Explain any TWO of the following money market instruments:

Treasury bills: short-term debt instrument issued by government. It is a primary security. It represents a claim on the government payable at some future date. TBs are fully secured and guaranteed by the government in SA.

Negotiable certificates of deposit: a debt instrument sold by a bank to depositors that pays annual interest of a given amount and at maturity pays back the original purchase price. Negotiable NCDs are sold in the secondary market.

Bankers' acceptances: a bank draft (a promise of payment) issued by a firm, payable at some future date, and guaranteed for a fee by the bank that stamps it. The firm issuing the instrument is required to deposit the required funds into its account with the bank to cover the draft.

Part 2: Financial markets

Answer any TWO questions from 2.1, 2.2 and 2.3:

2.1 Explain why the return on a bond will not necessarily be equal to the interest rate (yield to maturity) on that bond. Use the relevant formulae applicable to a two years coupon bond to substantiate your answer. Also explain the possibility of a negative return on a bond. (10)

The rate of return can be defined as payments to the owner plus the change in its value, expressed as a fraction of its purchase price. The return on a bond is not necessarily equal to the yield to maturity on a bond. The return on a security shows how well you have done by holding this security over a stated period of time and it can differ substantially from the interest rate

measured by the yield to maturity. Because of fluctuating interest rates, the capital gains and losses on long-term bonds can be large. [When an investor sells a financial instrument before its maturity date, the sale will be subject to market rates. These market rates mean that the instrument might be sold at a profit or a loss depending on whether prices have increased or decreased.]

Formula:
$$P = C/(1 + i) + C/(1 + i)^2 + F/(1 + i)^2$$

Negative interest rates imply that a person is willing to pay more for a bond today than he will receive for it in the future. In September 2008, interest rates on three-month treasury bills in Japan fell very slightly below zero for a brief period.

- 2.2 Briefly explain and illustrate graphically how the demand and supply curves for bonds are derived. Explain which of these curves can be respectively associated with the lenders and borrowers of funds. Illustrate graphically how these curves will be influenced by an increase in the expected inflation rate (reasons are not required). Indicate the predicted new equilibrium (P,Q) as well as the direction of change of the interest rate. [10]**

Draw a graph based on figure 1 in chapter 5. The following is a basis for the explanation. It can be shortened as required.

For the sake of simplicity consider a bond that has no coupon payments but pays a fixed amount at the maturity date.

Demand Curve:

- Assume a discount bond worth R1000.
- The formula to calculate the interest rate: $i = Re = (F - P)/P$
- i = interest rate; Re = expected return; F = face value of the discount bond; P = initial purchase price of the discount bond.
- Assume that the price paid for the bond is R900: the interest rate would be $(R1000 - R900) \div 900 = 11.11\%$;
Assume that the price paid for the bond is R800: the interest rate would be $(R1000 - R800) \div R800 = 25\%$
Assume that the price paid for the bond is R950: the interest rate would be $(R1000 - R950) \div R950 = 5.26\%$
- From the above it can be seen that when the price of the bond increases the interest rate decreases and when the price of the bond decreases then the interest rate

- Ceteris paribus all other factors, the lower the price (higher the interest) the greater will be the demand for that bond. This is as per the theory of asset demand.
- This implies a downward sloping demand curve for bonds.

Supply Curve:

- Assume all other variables except the price of the bond remain constant.
- Assuming the same amounts as in the example above, if the price of the bond decreases the interest rate increases.
- This higher return implies that this bond is relatively expensive to firms who wish to borrow by issuing bonds. Thus a firm is more likely to supply more bonds to the market when price is higher and interest rate is correspondingly lower.
- This implies a positive relationship between price and quantity supplied for bonds.

Market Equilibrium:

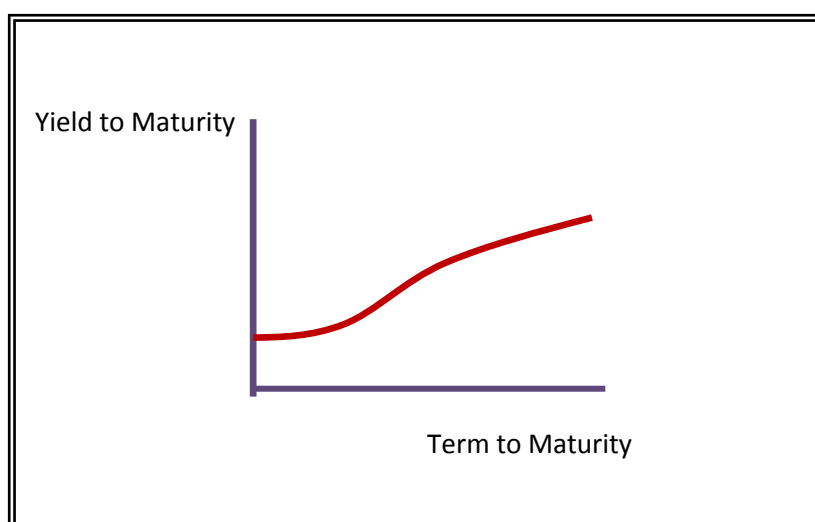
- This occurs when the amount that people are willing to buy (quantity demanded) equals the amount that people are willing to sell (quantity supplied) at a given price. The point where the market will settle.
- In the bond market this is achieved when the quantity of bonds demanded is equal to the quantity of bonds supplied: $B_d = B_s$.
- The concepts of excess demand and excess supply can be used to explain the establishment of the equilibrium price and quantity in the bond market.
- Excess demand means that more people want to buy bonds than others are willing to sell, this will drive the prices of bonds upwards.
- Excess supply means that more people wish to sell bonds than wish to buy bonds. This will drive the price of bonds downwards

Use the graph you have drawn to illustrate the effect of an increase in expected inflation rate. The demand curve would shift to the left as people would rather buy other assets rather than bonds. Illustrate what happens to equilibrium price and quantity.

2.3 The yield curve is a graphical representation of the term structure of interest rates. Draw a nominal yield curve and explain in detail what the yield curve signifies (its definition). Also list three empirical facts typical of the yield curve. (10)

When the yields on bonds with differing terms to maturity but the same risk, liquidity and tax considerations are plotted on a graph, this is called a yield curve. Normal yield curves are upward-sloping and this means that the long-term interest rates are above the short-term interest rates.

A normal yield curve:



The three empirical observations are:

- Interest rates on bonds of differing maturities move together over time.
- When short-term interest rates are low, yield curves are more likely to have an upward slope; when short-term rates are high, yield curves are more likely to slope downwards and be inverted.
- Yield curves almost always slope upward.

Part 3: Financial institutions

Answer question 3.1:

3.1 Briefly explain the meaning of asymmetric information and how this could lead to the problems of adverse selection and moral hazard in financial markets. Also indicate what measures government can take to alleviate the negative effects of asymmetric information. (10)

Asymmetric information refers to situations where one party's insufficient knowledge about the other party involved in a transaction makes it impossible to make accurate decisions when conducting transactions.

- Adverse selection is a problem arising from asymmetric information and occurs before the transaction takes place. Potential bad credit risks are the individuals that most actively seek out loans. Adverse risk increases the chances that a loan might be made to a bad credit risk and so lenders might decide not to make any loans.
- Moral hazard occurs after the transaction has taken place. It is the risk that one party to a transaction will engage in behaviour that is undesirable from the other party's point of view.
- The analysis of how the above asymmetric problems affect economic behaviour is referred to as **agency theory**.

Government regulation to increase information: government could be responsible for releasing relevant information. However, this could be a politically sensitive matter. Another way in which government may assist would be to regulate the securities markets in ways that encourage participants to reveal honest information about themselves. This would take the form of audits by reputable auditing firms.

Answer either question 3.2 or question 3.3

3.2 Explain why collateral is prevalent in debt contracts. Also explain why the net worth of the borrower functions in the same way as collateral. (5)

Collateral is property that is pledged to the lender to guarantee payment in the event that the borrower is unable to make debt repayments. In the case of debt contracts, even if a borrower defaults the value of the assets held as collateral would be able to cover the amounts that are owing. The fact that the borrower might have to give up valuable assets tends to reduce the moral hazard in debt contracts. Net worth (difference between assets and liabilities) of individuals can serve as cover (collateral) for a debt contract. If borrowers have a lot to lose they are less likely to default.

3.3 Explain why debt contracts are often complicated legal documents that place substantial restrictions on the behaviour of the borrower. (5)

Debt contracts require complicated restrictive covenants to lower moral hazard. There are four types of restrictive covenants that can help to reduce moral hazard risks in debt contracts, these are:

- Covenants to discourage undesirable behaviour
- Covenants to encourage desirable behaviour
- Covenants to keep collateral valuable.
- Covenant to provide information.

Part 4: Central banking and the conduct of monetary policy

Answer either question 4.1 or 4.2.

- 4.1 (a) Derive the money multiplier equation:
 $M = [1+c]/[r + e +c](MB)$. Explain its purpose as well as the meaning of all the variables. (7)**

Refer question 4.1 in May/June 2010 paper.

- (b) Briefly discuss the degree to which the central bank has control over M by referring to the variables in the equation as well as the composition of MB. (8)**

If the money supply is considered to be exogenous this means that the causal direction runs from changes in the money stock to changes in nominal output. Exogenous money presupposes that the money stock can be directly influenced or determined by agents other than the private nonbank sector, namely the central bank.

Most of the growth in money supply can be explained by growth in the demand for credit on the part of the nonbank public, the money supply is in fact mainly endogenous. On the basis of $M = mMB$, then causality runs from MB to M and the central bank does not control M directly but rather controls the interest rate and thereby influences M. As regards the components of the multiplier, the central bank would control the required reserve ratio (r) but both the other factors (excess reserves and currency ratio) would be decided by the banks and the nonbank public respectively.

- 4.2 Explain and graphically illustrate how the market for bank reserves functions in South Africa. (Hint: explain each of the curves (and its**

components), the point of equilibrium and how the SARB in principle conducts its monetary policy. (15).

Refer question 4.4 in May/June 2011 paper.

Part 6: Monetary theory

6.1 Briefly explain the Quantity theory of money (QT) by referring specifically to its assumptions and predictions. Also demonstrate that the QT can be transformed into a QT of money demand. Does the assumption regarding the velocity of money (V) agree with its empirical analysis in most countries? (10)

The quantity theory of money is derived from the equation of exchange. It states that the nominal income is determined solely by movements in the quantity of money. When the quantity of money (M) doubles, $M \times V$ doubles and so does $P \times Y$, the value of nominal income.

The classical economists believed that wages and prices were completely flexible (assumption) and so the level of aggregate output (Y) in an economy during normal times would remain at full-employment level and was therefore fairly constant. The QT implies that if M increases then there will be an increase in P, because V and Y are assumed to be constant.

The quantity theory of money provided an explanation of movements in the price level: movements in the price level result solely from changes in the quantity of money.

Because the QT tells how much money is held for a given amount of aggregate income, it is considered to be a theory of the demand for money. Fisher's QT suggests that the demand for money is purely a function of income, and interest rates have no effect on the demand for money.

Empirical data has shown that velocity of money is not constant. V may be defined in two ways:

- $V = PY/M$ [$MV = PY$] and this is referred to as "income velocity of circulation".
- $V = PT/M$ [$MV = PT$] and is referred to as "transaction velocity of circulation".

- The transaction velocity measures the average number of times a given amount of money is spent over a given period. It reflects the number of transactions that need to take place for a given amount of finished output (Y) to be produced.

6.2 Briefly explain why the ISLM model may be regarded as unrealistic. Focus particularly on the interpretation of endogenous and exogenous variables within the ISLM model and on how the money supply is determined in South Africa. Which additional assumption regarding the LM curve would improve the relevance of the ISLM model for monetary policy in South Africa? [10]

Some academics and economists argue that the ISLM model should no longer be used in economic theory because it is unrealistic. A number of factors need to be considered in this regard:

- (i) Any economic model is a simplification of reality and so all economic models can be called unrealistic.
- (ii) The intended purpose of the ISLM model is to show the links between the major macroeconomic variables and it shows how the real components of Y are related to each other. [$Y = C + I + G + NX$]. It provides an “elegant framework” to determine how changes in one variable (exogenous variables) impact on other (endogenous) variables. [M = money supply; Y = total income/output; C = consumption spending by households; G = government spending; I = Investment spending; NX = net exports; i = interest rate.]
- (iii) Exogenous variables in the case of the ISLM model refer to those that affect certain variables in the model but are not, in turn, affected by any of the variables in the model. Endogenous variables are those which are affected by other variables in a model. An important assumption is made that money supply (M) is exogenous, while income (Y) and interest rate (i) are endogenous. In SA at present the SARB controls the interest rate making it exogenous and not the money supply, therefore, the assumption that money supply is exogenous is not applicable at all, money supply is, in fact, endogenous.
- (iv) The ISLM model assumes that the aggregate price level is constant because there is no variable within the model that represents the aggregate price level. Despite this assumption being unrealistic, it

does not impact on the use of the ISLM model as long as it is used for short-periods with low inflation.

- (v) The main problem stems from the assumption that the interest rate is endogenous to the money market, and money supply is exogenous.
- (vi) If the model was adapted to account for this reality, the LM curve would be reflected as a straight line (horizontal, elastic) at the interest rate fixed by the central bank. When this is done the model does lose some of its “neatness and elegance”.

In conclusion, the ISLM model no longer provides a good representation of reality but nevertheless remains the main paradigm in undergraduate macroeconomic theory.

6.3 The debate between the early Keynesians and the early monetarists regarding the importance of money is essentially a debate between the approaches of using “structural model” versus “reduced-form” evidence. Discuss. [15]

How important is monetary policy to fluctuations in an economy?

- Monetarists tend to focus on reduced-form evidence and find that changes in money supply are very important to economic fluctuations.
- Keynesians, focus on structural model evidence based on the components approach to determinants of aggregate demand, and are less likely to find monetary policy important.

Early Keynesian evidence on the importance of money

- Early Keynesians held the view that monetary policy did not matter at all. In their opinion changes in money supply had not effect on aggregate output and consequently did not affect the business cycle.
- Modern Keynesians accept that monetary policy has an affect on economic activity.
- The following three pieces of **structural model evidence** supported the views of the early Keynesians:
 - Keynesians really only considered the $\Delta M \rightarrow \Delta i \rightarrow \Delta I \rightarrow \Delta Y$ link.
 - During the Great Depression interest rates on US Treasury securities fell to extremely low levels and yet did not cause Investment spending to increase. Keynesians argued that this was easy (expansionary) monetary policy. So monetary policy was unable to explain the severe contraction in the US economy.

- Early empirical studies found no link between movements in nominal interest rates and investment spending. Because the Keynesians considered this one of the channels (link between money sector and real economy) they found it very weak and therefore insignificant.
- Surveys of business people revealed that decisions on how much to invest in new physical capital are not influenced by market interest rates, again revealing that this link was weak.
- Consequently most economists paid little attention to the effects of monetary policy before the mid-1960s.

Objections to the early Keynesian approach:

- Led by Milton Friedman and group of economists from University of Chicago.
- Objected to Keynesian interpretation on the grounds that the structural model used by the early Keynesians was severely flawed.
- They argued that the monetary policy during the Great Depression had in fact been contractionary. This contraction had been characterized by a large number of bank failures and consequent reduction in money supply.
- How about the low interest rates, surely this was an indication of expansionary policy? This argument was dealt with by noting that there were two levels of securities, namely high-grade corporate bonds and low-grade bonds. Interest rates on high-grade bonds were low but interest rates on low-grade bonds were at the highest levels ever.
- This example highlights the weakness of a model such as the structural model used by the Keynesians.
- An important second reason why the early Keynesian structural model evidence was misleading: during periods of deflation, a low nominal interest rate does not necessarily indicate that the cost of borrowing is low. Evidence indicates that this is in fact what happened during the Great Depression. Real interest rates were in fact high during this period and therefore monetary policy was in fact tight.
- Monetarists also objected to the weak link argument. They argued that a weak link between nominal interest and investment does not rule out a strong link between real interest rate and investment spending.
- Monetarists also argue that the interest-rate effect on investment spending might be only one of many channels through which monetary policy affects aggregate spending.

Early monetarist evidence on the importance of money

- Milton Friedman and his followers published a series of studies based on **reduced-form evidence** that promoted the case for a strong effect of money on economic activity.
- In general, reduced-form evidence can be broken down into three categories:
 - Timing Evidence: looks at whether the movements in one variable typically occur before another; conclusions reached on this basis is that money growth causes business cycle fluctuations but its effect on the business cycle operates with “long and variable lags”. Studies had revealed that, on average, the peak in the rate of money growth occurred 16 months before the peak in the level of output. It is easy to misinterpret timing relationships.
 - Statistical Evidence: examined the correlations between money and aggregate output or aggregate spending by performing formal statistical tests. When Friedman and Meiselman conducted the test to see which is more highly correlated with Y: M (money supply) or A (aggregate spending), they discovered that the monetarist model won. However, later studies indicated that there is no “clear-cut victory” for neither the Monetarists nor the Keynesians.
 - Historical Evidence: examines specific past episodes to see whether movements in one variable appear to cause another. The monetarist historical evidence has been very influential in gaining support for the monetarist position. [Friedman and Schwartz’s *A Monetary History*]. Makes this stronger evidence than the others: several episodes occur in which changes in the money supply appear to be exogenous events and so are almost like controlled experiments: as a result the *post hoc, ergo propter hoc* principle is far more likely to be valid. This means that if the decline in the growth rate of the money supply is soon followed by a decline in output in these episodes then much stronger evidence is presented that money growth is the driving force behind the business cycle.

SELECTED QUESTIONS FROM THE STUDY GUIDE

- 1 Explain briefly what a common stock is, what purpose it serves, and how it affects business investment decisions. (3)

A common stock refers to a share of ownership in a company (corporation). The owner of the stock has a claim on the earnings of the company (corporation). The stock is an important factor in business investment decisions, because the price of shares affects the amount of funds that can be raised by selling newly issued stock to finance investment spending.

2 List two ways in which the quantity of money may affect the economy. (2)

There is evidence to support the fact that money plays an important role in generating business cycles and evidence exists that the rate of money growth has declined before every recession.

Empirical data indicates that an increase in the supply of money (quantity of money) is linked to increases in prices (inflation).

3 List and define three (3) commonly used measures of the aggregate price level.

The three measures of aggregate price level are:

- GDP deflator is defined as nominal GDP divided by real GDP.
- PCE deflator is the nominal personal consumption expenditures divided by real PCE.
- CPI is the consumer price index and is expressed as a price index with the base year equal to 100.

4. Explain the functions performed by financial intermediaries and how they can promote economic efficiency in financial markets. (8)

The basic function of financial markets is to channel funds from savers who have an excess of funds to borrowers (spenders) who have a shortage of funds. Financial markets can do this either through direct finance, or through indirect finance which involves a financial intermediary. The intermediary acts by channelling funds from the surplus unit to the deficit unit and helps to overcome some of the problems that exist such as transactions costs and asymmetric information.

This channelling of funds helps improve the economic welfare of everyone in society because it allows funds to move from people who have no productive investment opportunities to those who have such opportunities. In this way financial markets contribute to economic efficiency. In addition the channelling of funds can directly benefit

consumers by allowing them to make purchases when they need them most.

5 Explain the broad purpose of government regulation of the financial system. (6)

The government regulates the financial system for two main reasons:

(i) to increase the amount of information available to investors and so reduce the problem of asymmetric information. Asymmetric information gives rise to the problems of adverse selection and moral hazard which can prevent the financial system in an economy from performing efficiently. [In South Africa one of the main reasons for regulating the financial system is to protect consumers who do not have as much knowledge of many of the financial products as do the suppliers.]

(ii) ensuring the soundness of financial intermediaries. Asymmetric information can lead to the widespread collapse of financial intermediaries. This is known as a financial panic. Such financial panic can cause the collapse of financial institutions and it can produce large losses for the public and serious damage to the economy. Various types of regulation have been introduced in an attempt to prevent this from happening.

6. Distinguish between nominal and real interest rate (3)

The real interest rate is defined as the nominal interest minus the expected rate of inflation. The real interest rate reflects the real cost of borrowing and is likely to be a better indicator of the incentives to borrow and lend.

The nominal interest rate ignores the effects of inflation and is frequently the interest rate which is generally referred to in an economy.

7. Explain how Keynes' liquidity preference framework can be used to explain the effects of an increase in income, a rise in the price level and an increase in the money supply (assume that all other economic variables remain constant). Then explain why an increase in money supply does not necessarily lead to a decrease in interest rates over the longer term. (12)

The liquidity preference framework is based on the assumption that there are two main categories of assets that people use to store wealth: money and bonds. In addition it is assumed that money receives no return while

interest represents the opportunity cost of money and shows the return that would be received if wealth was held in the form of bonds. The total wealth in the economy is therefore equal to the sum of money and bonds. The liquidity preference framework uses the demand and supply of money to determine interest rates.

In Keynes's liquidity preference framework two factors cause the demand curve for money to shift: income and the price level.

Increase in income: referred to as the income effect. Any increase in income leads to an increase in the demand for money for the following reasons:

- As an economy expands and income rises, wealth increases and people want to hold more money as a store of value.
- As an economy expands, people will want to transact more and this will also cause the demand for money to increase.

The conclusion is therefore reached that a higher level of income causes the demand for money at each interest rate to increase and the demand curve to shift to the right.

Price-level effect: A rise in price levels means that people will have to hold more money in order to transact. That is they will increase the nominal amount of money they hold. The conclusion is, therefore, that a rise in the price level causes the demand for money at each interest rate to increase and the demand curve to shift to the right.

Increase in the money supply: assume that the money supply is completely controlled by the central bank. An increase in money supply implies that the money supply curve shifts to the right. The interest established at the new equilibrium point will be at a lower rate of interest, *ceteris paribus*, in the short-term. This is referred to as the liquidity effect.

Increase in money supply does not necessarily lead to a lower interest rate in the longer term:

- An increasing money supply has an expansionary influence on the economy. National income and wealth will increase and the income effect of an increase in the money supply leads to an increase in the interest rate.

- An increase in the money supply can also cause the overall price level in an economy to increase. An increase in the price level will also result in an increase in the interest rate.
- The higher inflation rate (i.e. increasing prices) that results will also lead to an increase in interest rates.

The conclusion that may be reached from the above is that there are four possible effects on interest rates when money supply increases: the liquidity effect, the income effect, the price-level effect and the expected inflation effect. The liquidity effect indicates that an increase in money supply will lead to a decrease in the interest rate. The other effects work in the opposite direction and are likely to dominate. Therefore, an increase in the money supply leads to higher, rather than lower interest rates.

[Note the difference between the price-level effect and expected inflation effect:

price-level effect remains even after prices have stopped rising, whereas the expected inflation effect disappears]

8. Briefly explain the meaning of asymmetric information and how this could lead to the problems of adverse selection and moral hazard financial markets. (6)

The problem of asymmetric information arises when one party has insufficient knowledge about the other party involved in a transaction which makes it impossible to make accurate decisions. The problem of asymmetric information gives rise to two types of problems

- Adverse selection: this is when asymmetric information occurs before the transaction. Potential bad credit risks are the most likely parties to seek out loans. Because it is difficult to tell the good credit risks from the bad, lenders might decide not to make any loans.
- Moral hazard: this occurs after the transaction has occurred. The lender runs the risk that the borrower might will engage in activities that are undesirable from the perspective of the lender and may endanger the ability of the borrower to pay the loan back.

This analysis is often referred to as the agency theory and forms the basis for the eight facts that explain the financial system works.

9. **Explain in general why indirect financing is more important than direct financing and in particular, why banks are the most important source of external finance for financing businesses. Then comment on the two statements: “The role of banks in lending will probably decline in future” and “The more established a firm is, the more likely it will issue securities to raise funds”. (10)**

According to the statistics from the USA, direct financing (since 1970s) is used in less than 10% of the external funding of American business. This position is changing in the USA. In most other countries the amount of financing raised through direct financing is even less. This is an indication that direct financing is much less important than indirect financing in most economies. For this reason the role of financial intermediaries is very important.

Financial intermediaries, particularly banks, are the most important source of all external funds used to finance business. They help to overcome the problems of adverse selection which prevents the securities market from being effective in channeling funds from savers to borrowers. However, banks' share of external funds for businesses in industrialized countries have been declining in recent years.

“The role of banks in lending will probably decline in future”: due to improvements in information technology in the USA, the lending role of financial institutions such as banks has declined. The simultaneous decline of costs and income advantages of banks has resulted in reduced profitability of traditional banking and an effort by banks to leave this business and engage in new and more profitable activities.

“The more established a firm is, the more likely it will issue securities to raise funds”: It is a fact that well-known corporations find it much easier to raise finance in the securities market than do the smaller businesses. People and markets are better informed on these companies and it will therefore be easier for such companies to find funds directly when required.

10. **Explain why moral hazard explains why stocks are not the most important source of financing for businesses and why debt contracts may be preferable. (Hint: in your answer refer, among others, to the principal agent problem). (12)**

Separation of ownership (shareholders) and management (do not own shares) in companies, give rise to the **principal-agent problem**. This is a

type of moral hazard problem. Managers (agents) may act in their own interests rather than in the interests of the shareholders (principals). The degree of the problem will be affected by the level of integrity of the agents involved. Internationally and even locally, managers have frequently been accused (and found guilty) of diverting funds for their own private benefit. Managers might also follow strategies that allow them to increase their own personal power in a company, rather than for material benefit, or even in the interests of the company itself.

An equity contract is a claim on profits in all situations, whether the firm is making or losing money. If a contract is structured so that moral hazard would exist only in certain situations, there would be less need to monitor managers, and the contract would be more attractive than the equity contract. The debt contract has exactly these attributes because it is a contractual agreement by the borrower to pay the lender fixed amounts at periodic intervals. When the firm is making high profits, the lender simply receives the contracted amounts and does not need to know the actual profits that are being made. Furthermore, the lender does not need to know all the details of the activities that are being pursued by the borrower and will be happy as long as the interest payments are made.

The less frequent need to monitor firms and thus the lower cost of state verification helps explain why debt contracts are used more frequently than equity contracts to raise capital.

11. **Explain why the underdeveloped financial systems in developing and transitional economies face several difficulties that restrict their efficiency, and how certain practices in developing and transitional countries reduce economic efficiency. (6)**

In general underdeveloped financial system leads to a low state of economic development and economic growth. The main difficulties faced are:

- in many countries the system of property rights (rule of law, constraints on government expropriation, etc.) functions poorly, making it difficult to use these tools to help solve the adverse selection and moral hazard problems.
- A poorly developed or corrupt legal system may make it extremely difficult for lenders to enforce restrictive covenants. Lenders are therefore less likely to lend and this will decrease the opportunity for investment.

- Governments often use the financial systems to direct credit to themselves or to favoured sectors of the economy by, for example, setting artificially low interest rates on certain types of loans.
- Banks in many transition and developing countries are owned by their governments and because of the absence of the profit motive, these state-owned banks have little incentive to allocate their capital to the most productive uses. Often the primary loan customer is the government.
- Many developing countries have an underdeveloped regulatory apparatus that prevents the provision of adequate information to the marketplace, e.g. weak accounting standards.

12 Write a short essay (maximum one page) on the Great Depression in the USA (1929-1933) and the role that the financial sector played. (10)

In response to the doubling of stock prices in 1928 and 1929 on the US stock market. Federal Reserve officials viewed the high stock prices as the result of speculation and therefore dangerous for the economy. The central monetary authorities (Federal Reserve officials) implemented a tight monetary policy to raise interest rates. The outcome was the spectacular crash of the US stock market in October 1929. It lost more than 60% of its value.

While there was a fairly quick reversal of the losses by mid 1930, the crash had far reaching effects. These included adverse shocks to the agricultural sector, a continuing decline in the stock market after middle of 1930 and a sequence of bank collapses from October 1930 to March 1933. The decline in stock prices and the increase in uncertainty created by the domestic contraction made adverse selection and moral hazard problems worse in the credit markets. The level of financial intermediation had been reduced by the loss of banks and this intensified the problems and decreased the ability of financial markets to channel funds to firms with productive investment opportunities. The volume of outstanding commercial loans fell by about 50% and investment spending collapsed (by about 90% compared to 1929 level).

It is generally believed that it was the steep drop in prices that kept the economy from recovering quickly. This decline in prices triggered debt deflation in which net worth fell because of the increased burden of indebtedness borne by firms. The decline in net worth and the resulting increase in adverse selection and moral hazard problems in the credit

markets led to a prolonged economic contraction. Unemployment rose to 25% of the labour force. This economic contraction is considered one of the worst in history.

13 Briefly explain why the price stability goal in South Africa is desirable (despite other pressing economic problems) and the role of the nominal anchor. Also explain the nature of the time-inconsistency problem. (15)

In most countries, the goal of price stability (low and stable inflation) is increasingly seen as the primary goal of monetary policy. This is because a rising price level (inflation) causes uncertainty. Such uncertainty is believed to hamper economic growth. Because South Africa faces such a serious unemployment problem, it is often argued that monetary policy should not focus on price stability but rather on other macroeconomic objectives such as economic growth and full employment and that inflation is the “cost” of economic growth and increased employment.

According to Mishkin, there is no trade-off between inflation and economic growth in the long term. While in the short term high inflation may be tolerable, it can have devastating effects on an economy in the long term. It distorts markets, makes planning more difficult, promotes unproductive activities, discourages investment and savings and has undesirable distributional effects on the participants in an economy.

By focusing on a nominal variable such as the inflation rate or money supply, increases in the general price level can be limited in order to achieve price stability. Adherence to a nominal anchor that keeps the nominal variable within a narrow range promotes price stability by directly promoting low and stable inflation expectations. Nominal anchor is also important because it can limit time-inconsistency problem.

The time-inconsistency problem occurs when monetary authorities attempt to conduct monetary policy in a discretionary way which produces poor long-run outcomes. For example they might pursue an expansionary monetary policy which to boost economic growth in the short run, but the best policy might be not to pursue expansionary monetary policy so as to ensure inflationary conditions do not arise in the long run.

14 Derive the simple multiple deposit creation model (formula: $\Delta D = 1/r\Delta R$). Explain its meaning, the underlying logic of the process, its simplifying assumptions and its critique.

In the case of the USA, when the Federal Reserve supplies the banking system with additional reserves, the deposits increase by a multiple of this amount, this process is called multiple deposit creation.

Assumptions of the model (process):

- In the case of the single bank: a single bank will not make loans that exceed the value of the excess reserves it has before making the loan.
- In the case of many banks, or the banking system: whether a bank chooses to use its excess reserves to make loans or to purchase securities, the effect on deposit expansion is the same.

The workings of the model:

- In the case of the single bank: a single bank cannot by itself generate a multiple expansion of deposits. It cannot make loans greater in amount than its excess reserves because the bank will lose these reserves as the deposits (money made available) created by the loan find their way to other banks and the bank will then lose its reserves.
- In the case of the banking system: although one bank may lose excess reserves to another bank, these reserves do not leave the banking system. As a result the process of money creation continues as reserves move from bank to bank. This multiple increase in deposits is called the simple deposit multiplier. It is dependent upon the required reserve ratio and the formula for the multiple expansion of deposits can be written as follows:

$$\Delta D = 1/r \times \Delta R$$

Where: ΔD = change in total cheque deposits in the banking system

r = required reserve ratio

ΔR = change in reserves for the banking system

Critique of the model:

- The simple model of multiple deposit creation has serious deficiencies. Decisions by depositors to increase their holdings of currency or of banks to hold excess reserves will result in a smaller expansion of deposits than the simple model predicts. All four players – the central bank, banks, depositors and borrowers – are

important in the determination of the money supply. This leads to the derivation of a more complex money multipliers.

- The simple model seems to imply that the central bank (the Fed) has complete control over the level of deposits through (r) and the level of reserves (R). This depends, however, whether the proceeds from loans are deposited or kept as currency.
- If the proceeds are used to raise the level of currency then demand deposits (D) will not increase by as much as the “multiplier” might suggest.
- If a single bank decides not to grant loans to the full extent of its excess reserves then the full expansion does not occur.

15. **Briefly explain the arguments for a reversed causality, that is, “deposit creation leads to reserve holding” ($D \rightarrow R$) could be more realistic. (15)**

Mishkin’s analysis assumes that the reserve holdings of banks leads to deposit creation. Many other economists argue that in fact “deposit creation leads to reserve holding” and that this better describes what really happens. This is referred to as reverse causality.

- In a modern money system, cash reserves consist of money issued by the central bank which is mainly in the form of deposits which are kept with the SARB. Commercial banks are dependent upon the central bank for their cash.
- The central bank provides the banking system with its normal cash needs.
- The central bank can choose between two strategies: control the amount of cash it provides and allow the cash fund rate (repo rate) to find its own level; alternatively it can fix the cash funds rate and allow the amount of cash reserves it makes to find its own level. The second strategy is the one used: central banks seek to set the cash fund rate at a certain target level.
- For this reason there is a price constraint, but no quantity constraint on the amount of cash the central bank offers to the banking system.
- An individual bank that is prudent is most likely assured of the required cash reserves at the prevailing cash fund rate. For this reason it can grant all the credit and issue all the deposits required and then seek to obtain cash reserves. This means that D leads to R (reverse causality).
- This implies that changes in r, c and e do not cause a change in the impact of R on D but rather a change in the impact of D on R.

- If r increases banks would need more reserves for deposits created and since the central bank will provide these reserves.
 - If the currency ratio (c) increases, the central bank will have to provide more cash (MB) into the system
 - If the value of excess reserves (e) increases the central bank will also have to provide more cash (MB).
- Banks hold few excess reserves (ER). This seems to confirm the reversed causal direction view. In South Africa, particularly, banks do not have to comply with the cash reserve requirements on a day-to-day basis but only over a month period. This further removes the rationale for holding excess reserves.

16. Briefly explain the meaning of monetary targeting and the lessons learnt from the application of monetary targeting the US, Japan and Germany as it was applied from 1970s – 1990s. What are the main advantages and disadvantages of monetary targeting? (15)

In following a monetary targeting strategy, the central bank announces that it will achieve a certain value of the annual growth rate of a monetary aggregate.

Although policies of monetary targeting was followed in the USA, Germany, Japan and others in the 1970s it was quite different from the type of monetary targeting recommended by Milton Friedman. The central banks did not adhere to strict rules for monetary growth.

USA: In 1979 the Fed switched to an operating procedure that focused on nonborrowed reserves and control of the monetary aggregates and less on the federal funds rate. However, it had little success in achieving the monetary targets. In 1982 the Fed decreased its emphasis on monetary targets and in 1993 it abandoned this approach.

Japan: In 1974 Japan experience a large increase in the inflation rate (it increased to greater than 20%). It was believed that this was accommodated by the growth in money supply (also in excess of 20%). As a result in 1978, the central bank of Japan began to announce “forecasts” at the beginning of each quarter for M2 and CDs. The Bank of Japan’s monetary policy performance during the 1978 – 1987 period was much better than the Fed’s. Money growth in Japan slowed and was much less variable than in the USA. The result was a more rapid stop to inflation being achieved with less variability in real output than in the

USA. During the period 1987 to 1989 there were concerns about the appreciation of the Yen and so the Bank of Japan increased the rate of money growth. Many blame the speculation in Japanese land and stock prices on this increase in money growth. To reduce speculation, the Bank of Japan switched to a tighter monetary policy aimed at slower money growth. The aftermath was a substantial decline in land and stock prices. The resulting weakness of the economy led to deflation which promoted further financial instability. Critics have argued that Japan's monetary policy has been overly restrictive and this has contributed to the stagnation of the economy over the past few years.

Germany: Germany's central bank (Bundesbank) chose to focus on a narrow monetary aggregate called central bank money. In 1988 this was switched back to M3. The key fact about the monetary targeting regime in Germany is that it was not a Friedman type monetary targeting rule. The Bundesbank allowed growth outside of its target ranges for periods of two to three years. The monetary targeting regime in Germany demonstrated a strong commitment to clear communication of the strategy to the general public. Monetary targeting was primarily a method for communicating strategy of monetary policy focused on long-run considerations and the control of inflation.

Advantages of monetary targeting:

- information on whether the central bank is achieving its target is known almost immediately.
- Can send almost immediate signals to the public and markets about the stance of monetary policy.
- These signals help fix inflation expectations and produce less inflation.
- Help to constrain monetary policyholders from falling into the time-inconsistency trap, by calling for almost instant accountability for monetary policy to keep inflation low.

Disadvantages of monetary policy:

- The above only occurs if the following exist:
 - Strong and reliable relationship between goal variable and the targeted monetary aggregate. If this relationship is weak monetary targeting will not work.

17. **Briefly explain the Quantity theory of money (QT), that is, its assumptions and predictions. Demonstrate that the QT can be**

transformed into the Quantity theory of money demand. Does the assumption regarding V agree with the empirical findings? (10).

The quantity theory of money is derived from the equation of exchange. It states that the nominal income is determined solely by movements in the quantity of money. When the quantity of money (M) doubles, $M \times V$ doubles and so does $P \times Y$, the value of nominal income.

The classical economists believed that wages and prices were completely flexible (assumption) and so the level of aggregate output (Y) in an economy during normal times would remain at full-employment level and was therefore fairly constant. The QT implies that if M increases then there will be an increase in P, because V and Y are assumed to be constant.

The quantity theory of money provided an explanation of movements in the price level: movements in the price level result solely from changes in the quantity of money.

Because the QT tells how much money is held for a given amount of aggregate income, it is considered to be a theory of the demand for money. Fisher's QT suggests that the demand for money is purely a function of income, and interest rates have no effect on the demand for money.

Empirical data has shown that velocity of money is not constant. V may be defined in two ways:

- $V = PY/M$ [$MV = PY$] and this is referred to as "income velocity of circulation".
- $V = PT/M$ [$MV = PT$] and is referred to as "transaction velocity of circulation".
- The transaction velocity measures the average number of times a given amount of money is spent over a given period. It reflects the number of transactions that need to take place for a given amount of finished output (Y) to be produced.

- 18. Explain Friedman's approach of his modern quantity theory of money and which factors determine the demand for M/P. Then explain why changes in interest rates, according to Friedman, have little effect on the demand for money and why the money demand function is stable. (15)**

Milton Friedman developed his quantity theory of money in 1956. Friedman believed that the demand for money should be influenced by the same factors that influenced the demand for any other assets. He then applied the theory of asset demand to the demand for money.

The theory of asset demand indicates that the demand for money should be a function of the resources available to individuals and the expected returns on other assets relative to the expected return on money. Like Keynes, Friedman recognised that people want to hold a certain amount of real money balances .

The factors that Friedman argued would affect the demand for money were:

- Permanent wealth (Friedman's measure of wealth)
- Expected return on money
- Expected return on bonds
- Expected return on equity
- Expected inflation rate

Friedman did not take the expected return on money to be a constant. He argued that changes in interest rate would result in the difference between the return on bonds and the return on money remaining relatively constant (incentive terms for holding money remain fairly constant). As a result the demand for money would not be influenced by interest rates. So Friedman's demand for money function is one in which permanent income is the primary determinant of money demand.

Friedman also suggested that the random fluctuations in the demand for money are small and that the demand for money can be predicted accurately by the money demand function. When combined with his view that the demand for money is insensitive to changes in interest rates, this means that velocity is highly predictable.

In conclusion, Friedman's theory of demand is based on the theory of asset demand and he argues that the demand for money will be a function of permanent income and the expected returns on alternative assets relative to the expected return on money. The final outcome of Friedman's theory is that velocity is highly predictable and therefore money is the primary determinant of aggregate spending.

19. **Explain the meaning of the transmission mechanism of monetary policy in South Africa in general, describe its main links, explain how it influences domestic inflation and why monetary policy is subject to lags. (12)**

The transmission mechanism of monetary policy refers to the role that interest rates play in linking the financial sector with the real sector of the economy. This is seen in the processes that are set in motion when the SARB changes the repo rate.

The main links are:

- the operational instrument of monetary policy which is the repo rate. This has a direct effect on other variables in the economy (other interest rates, exchange rate, money and credit and other asset prices).
- Pressure of demand relative to the supply capacity of the economy is a key factor influencing domestic inflationary pressures.
- If market interest rates, the exchange rate, credit or other asset prices do not respond meaningfully to changes in the repo rate then monetary policy will have little effect.

In South Africa the repo rate affects the economy through a number of channels:

- Interest rate channel. Any change initially influences the interest on retail financial products. Almost immediately after the repo is changed, domestic banks adjust their lending rates. Firms and individuals respond to the changes in interest rates by altering their investment and spending patterns.
- Other financial asset prices: prices of foreign exchange act as a channel for the transmission of monetary effects. When the SA interest rate falls, deposits denominated in rand become less attractive than deposits in foreign currencies and the rand depreciates. The lower rand makes domestic goods cheaper causing a rise in net exports and hence aggregate output. The depreciation of the rand will also cause the price of imports to increase and becomes inflationary. Monetary policy can also affect the economy through its effects on the valuation of equities. When monetary policy is relaxed, the public finds that it has more money to spend, and one place this can be spent is the stock market. A higher demand for shares leads to an increase in prices. The combination of higher prices with higher fixed capital formation leads to an increase in output (Y). Household wealth can be affected by the repo rate and is also a powerful channel.

- Credit: this operates through bank lending. Expansionary monetary policy increases bank reserves and bank deposits, thus increasing the amount of loans available. This increase in loans will cause fixed capital formation and consumer spending to rise. Credit also affects the balance sheets of households and firms and arises from asymmetric information in credit markets.

20. Provide a perspective on Friedman's proposition that inflation is always and everywhere a monetary phenomenon. Evaluate the empirical evidence in this regard, that is, that of German (1921 – 1923) and that of Latin American countries (1980 – 1990). (10)

Milton Friedman believed that because inflation was caused by high growth rate of money supply, the reverse was the solution: keep the growth rate of money supply low and inflation would be prevented.

Reduced-form evidence shows a high correlation between the inflation rate and the growth rate of the money supply. In the case of German hyperinflation (1921 – 1923) the German government printed large amounts of money in order to make available the cash required to reconstruct Germany after World War I. Evidence shows that as the money supply increased so did prices.

More recently, rapid inflation in many countries seem to have links with increases in money supply. This is particularly the case in the Latin American countries that had highest growth rates in money supply and the highest inflation rates.

Mishkin indicates that if inflation is viewed as a continuing and rapid increase in the price level, almost all economists agree with Friedman. The issue to be considered is why and how does inflationary monetary policy come about. The intention is not to create inflation but rather to achieve some significant macroeconomic objective, e.g. economic growth. The final conclusion indicated by Mishkin is that the two underlying reasons are the adherence of policymakers to a high employment target and the presence of persistent government budget deficits.