ECS2602

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GOODS MARKET MODEL

- **Endogenous variables** - depends on other variables within the model
- consumption depends on income >> endogenous
- **exogenous variables** - constant, not explained within the model, taken as a given

The full model will consist of four sectors: households, firms, the government, and the foreign sector. Households earn income from firms, which they spend on private consumptions and savings. Firms produce goods sold on the goods market, and pay the revenue to households for factors of production. The government collects taxes which finance transfers and public consumption. Goods are also exported to and imported from the foreign sector. The first version of the model, however, is simplified as far as possible. It contains only the household- and firm sectors. It is closed in the sense of having no trade with the rest of the world, and private in the sense of having no government. According to the system of national accounts, GDP, denoted by Y, can be alternatively expressed in terms of production, expenditure, or income. The national account balance identity define GDP from the expenditure approach. It states that firm production, Y, will be used for either household consumption, C, or investments, I.

$$Y = C + I$$

Total Demand for Goods, (*Z*) (total = aggregate)

The total amount of goods and services demanded in the goods market. This total demand for goods and services determines the level of income and output in the economy.

Total amount of goods: (total = aggregate)

All goods and services produced even if they replace depreciated or worn out products.

Gross domestic expenditure (GDE)

The total value of spending within the borders of a country including imports but excluding exports, since spending on exports takes place outside the borders of the country.

Consumption Function

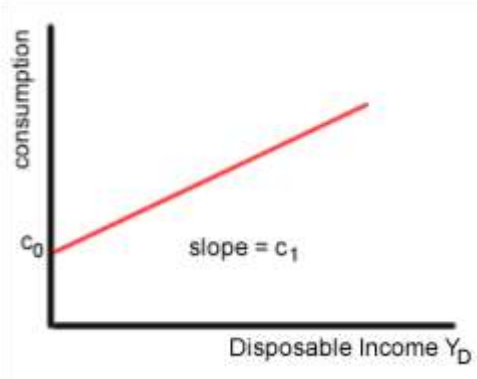
This is the spending by private firms and households. Households are assumed to consume a fixed proportion of their income. Since income is equal to production (Y), this simple rule can be expressed by the following consumption function:

$C = c_o + cY_d$

c_o- **autonomous consumption**, which is the consumption independent of income level and is the intercept or vertical component of the consumption curve

cY_d- is the **induced consumption**, the spending which is directly linked to income level; **disposable income** (Y_d) - income remaining after paying taxes, receiving gov't transfers

The parameter c, called the marginal propensity to consume (MPC), specifies how much is consumed out of an income increase. It is assumed to be constant and known, and to lie in the interval $0 < b < 1$. It is the slope of the consumption curve



Investment

Investments I are assumed to be constant, in the sense of being independent of production (or income).

$I = \bar{I}$

Placing a bar above the 'I' in investment, refers to the investment as a given, and does not respond to changes in income.

Real investment:

Spending on capital stock such as machinery, buildings, inventories e.t.c with the hope of a making a future profit. This increases the production capacity.

Government spending, (*G*)

Money spent by the government to stimulate the economy – like books for schools, personnel costs, bridges, roads etc.

The combination of Government spending (***G***) and Taxes (***T***) forms the fiscal policy.

The reason for assuming ***G*** and ***T*** to be exogenous variables is different to the reasons for ***I***. The reasons for treating Government and Taxes as exogenous variables is based on two distinct arguments:

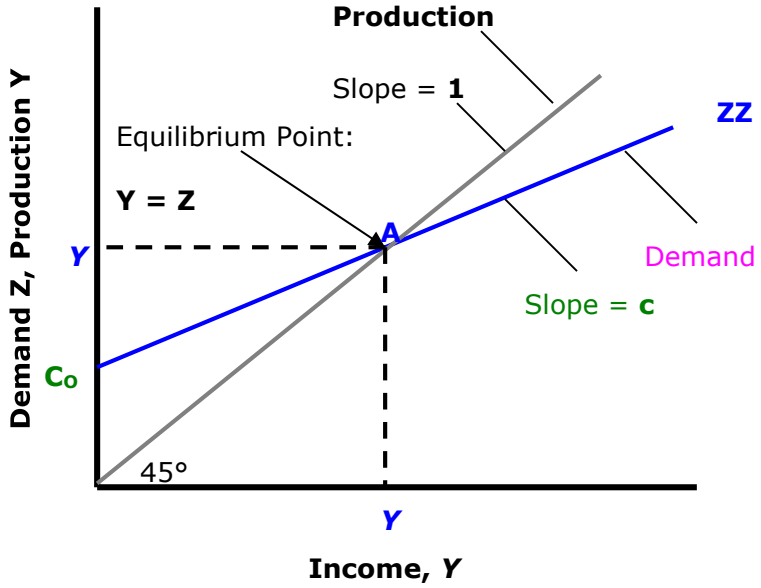
Governments do not behave with the same consistency as consumers or firms, so there is no reliable rule for ***G*** and ***T*** to which a formula can be written as was done with consumption. However there are certain predictable behavioral concepts in ***G*** and ***T***.

One of the tasks of the most important tasks in macroeconomics is to think about the implications of alternative spending (***G***) and tax (***T***) decisions, and what implications these decisions would have.

Exports are treated as autonomous

Imports are composed of induced and autonomous components as done is ECS1601

Equilibrium



NB: at equilibrium the following condition is held: Total spending in the economy= Total Income in the economy

IMPACT OF FISCAL POLICY TO EQUILIBRIUM

Fiscal policy is the government's policy in respect of the nature, level and composition of government spending, taxation and borrowing, aimed at pursuing particular economic goals. The main instrument of fiscal policy is the budget, and the main policy variables are government spending and taxation.

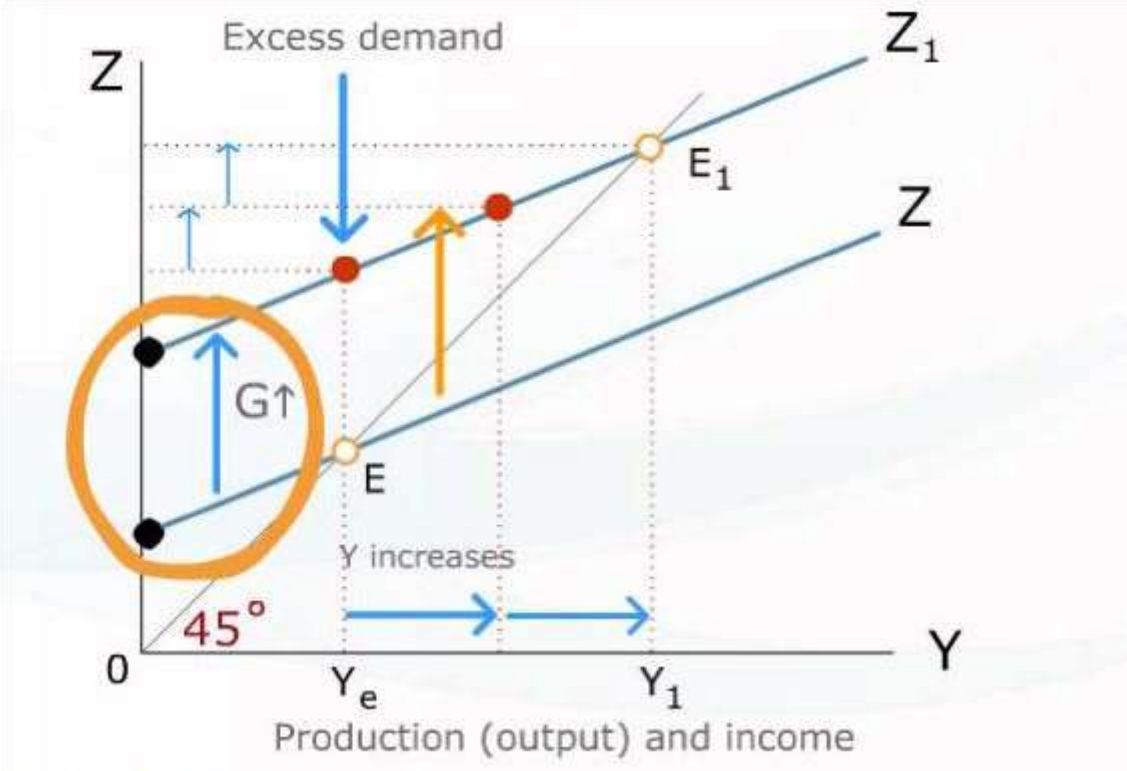
Expansionary Fiscal Policy

An **expansionary fiscal policy** is used to stimulate or expand economic activity by increasing the demand for goods. For fiscal policy to be expansionary it must increase the demand for goods which then increases production and income. This can be achieved by increasing government spending and/or by reducing taxation.

Effect of increasing G

We first consider the impact of increased government spending. An increase in government spending implies that government buys more goods from firms in the economy, for instance more text books for schools, medicines for hospitals, cement for buildings, etc. Firms respond by increasing their production of goods and services, to which end they employ more factors of production and households' income increases, with the result that they increase their consumption spending, thus increasing demand further, which stimulates the production of goods and services so that households' income increases further.

The multiplier process is in operation and the increase in government spending stimulates production and income in the economy.

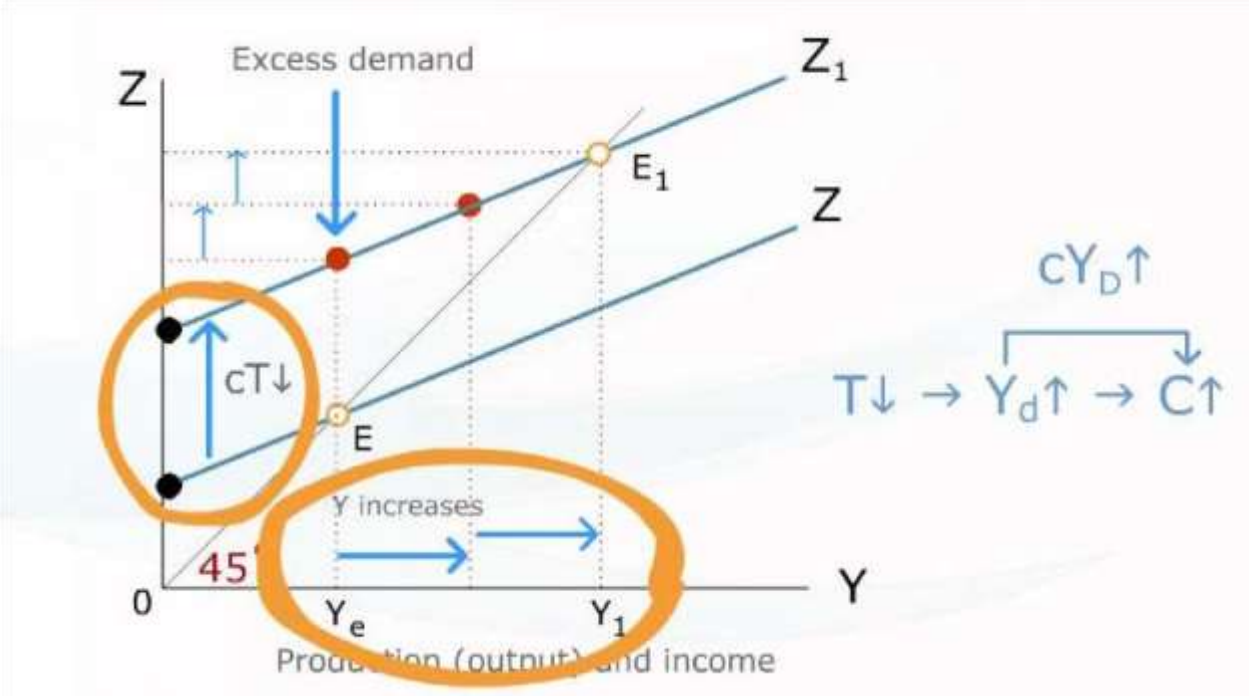


Using a chain of events the impact of an increase in government spending can be describe as follows:

G↑ → Z↑ → Y↑

(The opposite is true in the case of contractionary fiscal policy e.g. decrease in government spending.)

Effect of reducing T



Lower taxation increases autonomous spending and the vertical intercept increases equal to the marginal propensity to consume times the decrease in taxation and the demand for goods curve shifts upwards. The shift in the vertical intercept does not reflect the full extent of the decrease in taxation. Households increase their spending as their disposable income increase but not by as much as the increase in disposable income.

At the original level of production and income Ye excess demand develops on the goods market which stimulates production and therefore causes a further increase in household income, which causes a further increase in consumption spending and a further increase in the demand for goods, which again increases production, income and the demand for goods.

The process continues until a new equilibrium is reached at point E1 where a higher equilibrium income of Y1 is attained. Thus lower taxation has a multiplier effect on production and income.

Contractionary Fiscal Policy

A **contractionary fiscal policy** is used to cool down economic activity. For fiscal policy to be contractionary it must decrease the demand for goods which lowers production and income.

This can be achieved by reducing government spending and/or by increasing taxation.

Effect of decrease in G

We first consider the impact of a lower government spending. Government spending is reduced by buying less goods from firms in the economy. Firms respond by curbing production. As they decrease their production of goods they employ less factors of production and the income of households decrease. Households respond to this decrease in income by decreasing their consumption spending.

Lower consumption spending implies a further decrease in the demand for goods and producers react to this lower demand by producing less goods and services and income of households decreases further. The multiplier process, compared to an increase in government spending is now in the opposite direction, and the decrease in government spending has a contractionary impact on the level production and income in the economy.

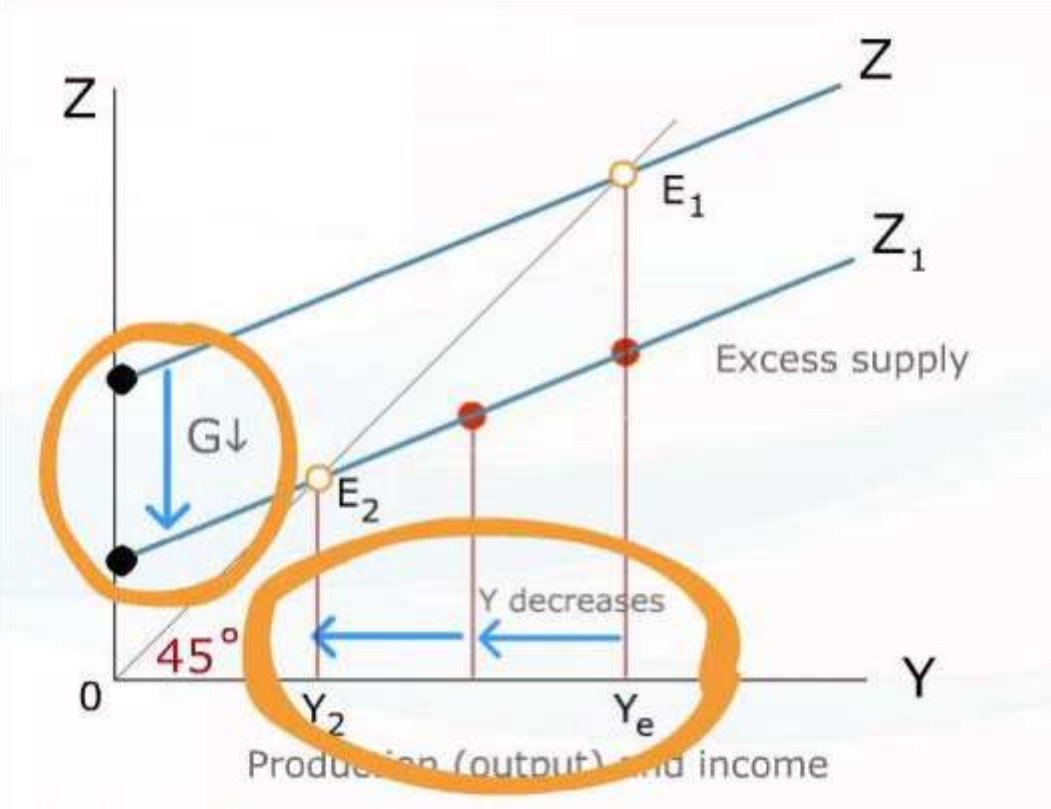
Using a chain of events the impact of a decrease in government spending can be describe as follows:

$G\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$

A decrease in government spending G (a) decreases the demand for goods Z, since government spending is a component of the demand for goods. A decrease in the demand for goods decreases the level of production and income, since the demand for goods determines the level of output and income. A decrease in the level of income decreases consumption spending by households since consumption spending is a positive function of the level of income.

The decrease in consumption spending causes a further decrease in the demand for goods. The multiplier process is in operation but in an opposite direction compared to an increase in government spending.

The impact of lower government spending is reflected as follows by the goods market model:



Effect of increase in T

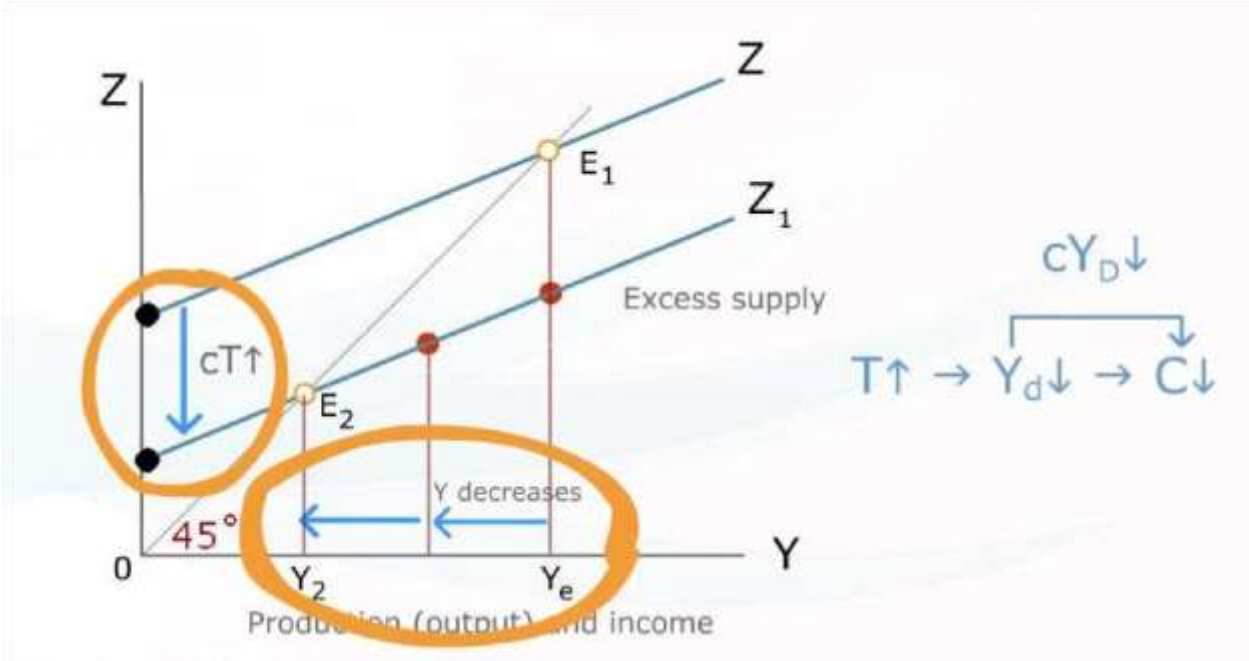
Higher income taxes decrease households' disposable income with the result that consumption spending and therefore the demand for goods decreases. Firms respond by reducing their production which further reduces households' income which causes another round of decreases in consumption, demand and production. The multiplier process is in the opposite direction compared to a decrease in taxation.

In terms of an events chain the impact to an increase in taxation can be described as follows:

T↑→Z↓→Y↓

Higher income taxes reduce disposable income and therefore decrease consumption spending and the demand for goods. Firms respond by decreasing their production and thus reducing income. The decrease in income further decreases disposable income, consumption spending and the demand for goods.

The multiplier process is in operation.



The goods market diagram shows that higher taxation reduces autonomous spending so that the vertical intercept decreases by an amount equal to the marginal propensity to consume times the increase in taxation, and the demand for goods curve shifts downwards. The reason why the decrease in the vertical intercept is less than the decrease in taxation is because households spend less as their disposable income declines, but to a lesser extent than their decrease in disposable income. At the original level of production and income Ye an excess

supply develops on the goods market. Producers respond by decreasing production and consequently households' income declines again. The decrease in income causes a further decrease in consumption spending and a further decrease in the demand for goods which again decreases production, income and the demand for goods.

The process continues until a new equilibrium is reached at point E2 with a lower equilibrium income of Y2. The increase in taxation has a multiplier effect on production and income. From the above analysis it is clear that a contractionary fiscal policy pursued by decreasing government spending and increasing taxation can be used to reduce the demand for goods and the level of production and income in the economy. This will have the effect of increasing the level of unemployment.

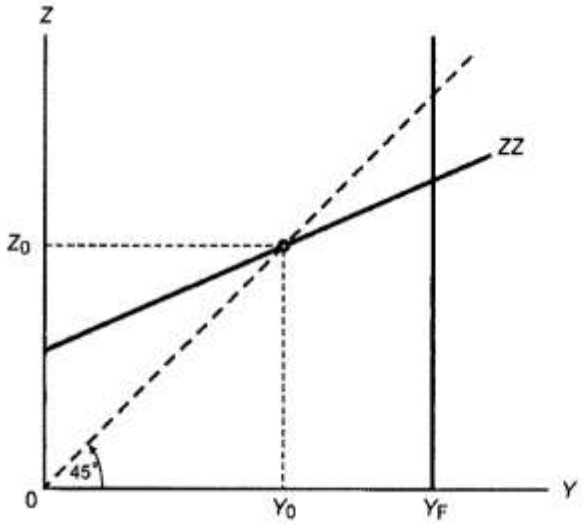
PRACTICE OF THE CONCEPT FROM PAST PAPERS

May 2012

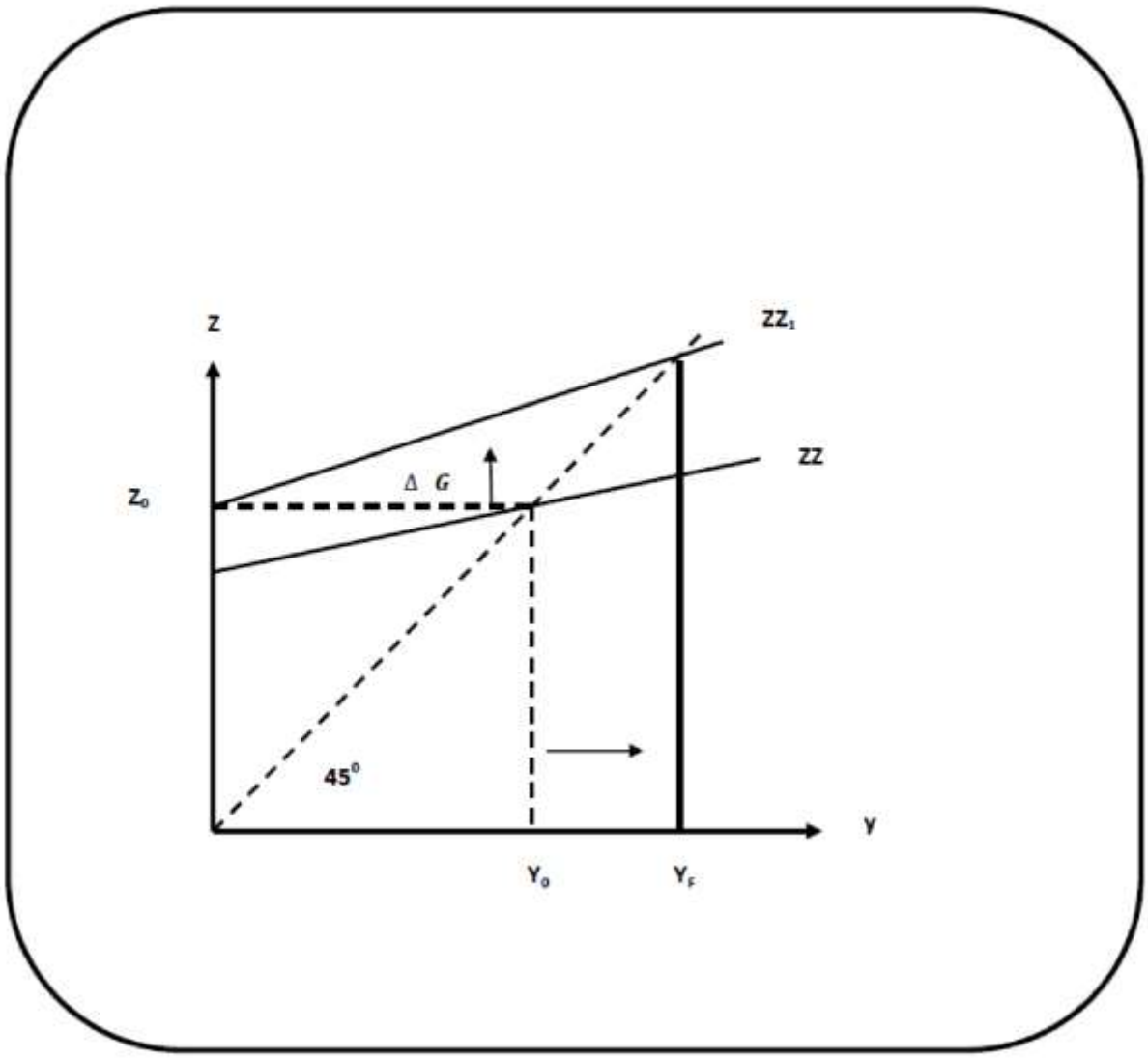
QUESTION 2/VRAAG 2 (4 marks/4 punte)

Use the following goods market model to explain how fiscal policy can be used to ensure full employment Indicate any shift and/or movement on the diagram (4)

Maak gebruik van die onderstaande goederemarkmodel om te verduidelik hoe fiskale beleid gebruik kan word om volle indiensneming te verseker Toon enige verskuiwing en/of beweging op die diagram aan (4)



Question 2



An expansionary fiscal policy can be used in one of the following ways:

1. Increase in government expenditure

2. Decease in taxation

Nov 2012

QUESTION 2/VRAAG 2 (2 marks/2 punte)

Distinguish between induced consumption and autonomous consumption **(2)**

Onderskei tussen geïnduseerde verbruik en outonome verbruik **(2)**

Induced consumption is spending by households and private firms which is directly dependent on income level.

Autonomous Consumption is the spending which is independent of income level.

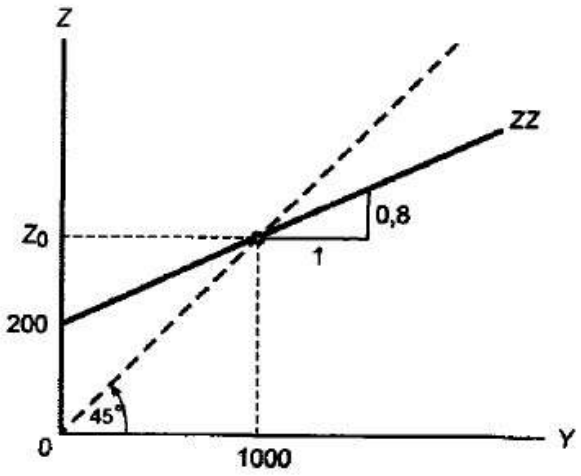
QUESTION 3/VRAAG 3 (6 marks/6 punte)

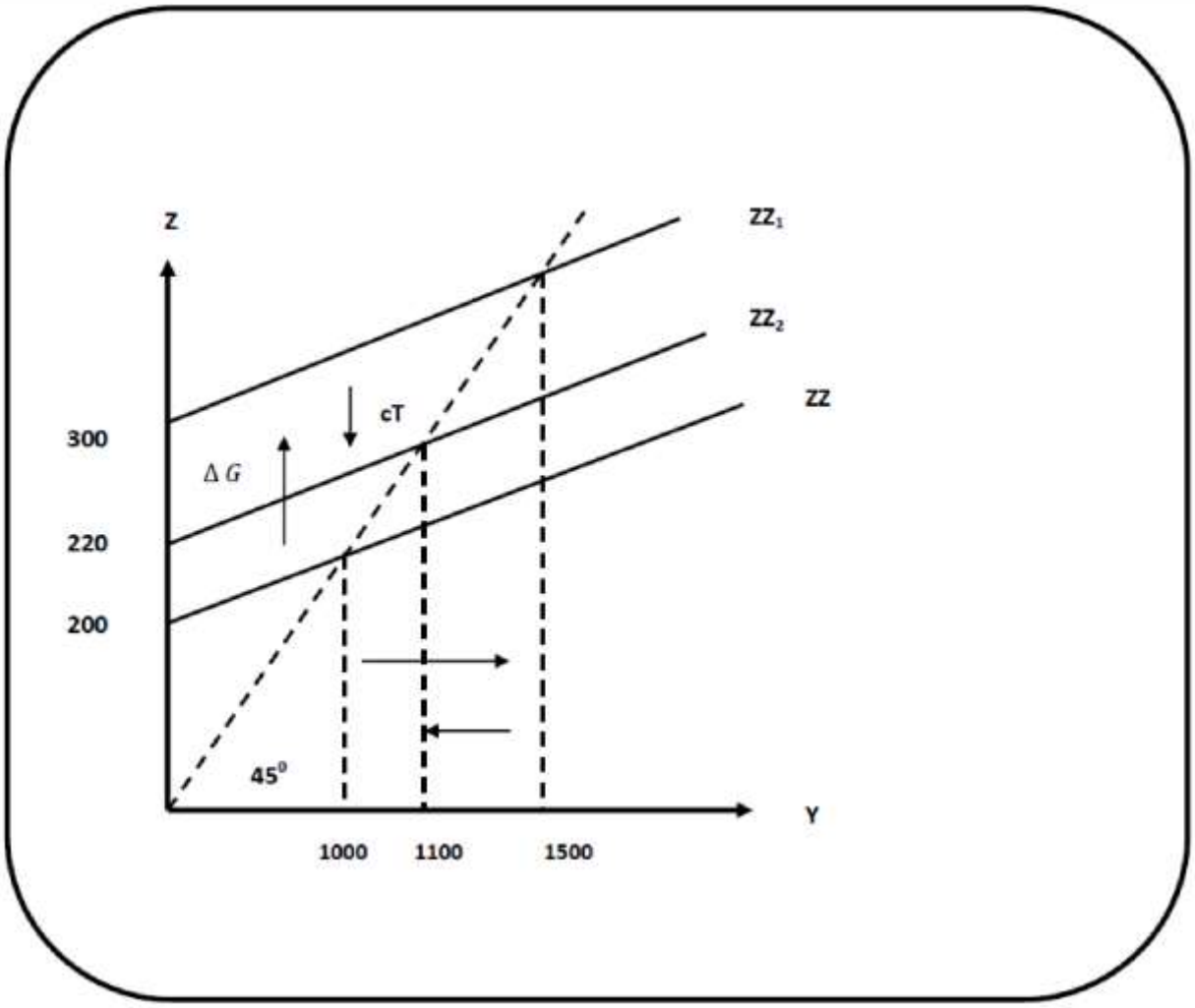
Use the following goods market model to explain the impact of an increase in government spending of a 100 and an increase in taxation of 100 on the equilibrium level of income Show your calculations

(2)

Gebruik die onderstaande goederemarkmodel om die impak te verduidelik van 'n toename van 100 in owerheidsbesteding en 'n toename van 100 in belasting op die ewewigsproduksie- en -inkomepeil Toon u berekeninge

(2)





$\propto = \frac{1}{1-0.8} = 5$

$Y = \propto \bar{Z} = 5 \text{ X } 300 = 1500$

$C\,\bar{1} = -,8x100 = -80$

$Y = \propto \bar{Z} = 5X220 = 1100$

If both government expenditure and tax increase by 100, the output will increase to 1100.

May/June 2013

QUESTION 1/VRAAG 1 (6 marks/6 punte)

a Differentiate between gross domestic expenditure and expenditure on gross domestic product (2)

a Onderskei tussen bruto binnelandse besteding en besteding op bruto binnelandse produk (2)

b Briefly explain why investment is positively related to the level of output and income (2)

b Verduidelik kortliks waarom investering positief verwant is aan die produksie- en inkomepeil (2)

Question 1

(a) Gross domestic expenditure involves the demand or expenditure by those in a domestic country. It entails, C,1,G,IM.

Expenditure on gross domestic product refers to spending goods and services produced within a country. In includes exports and exclude imports.

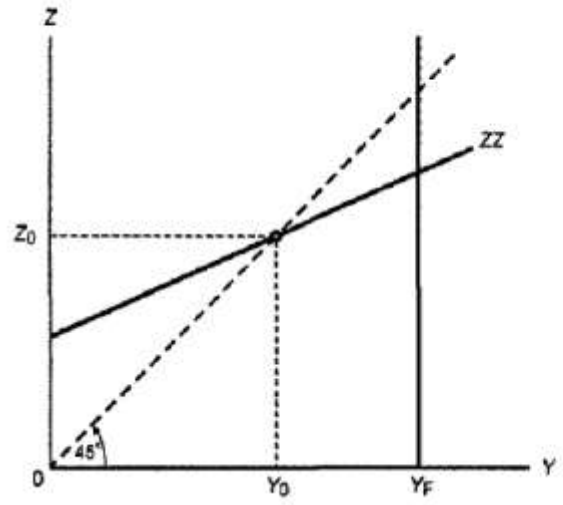
(b) Investment is a component of demand, if investment increase total demand increase. As a result the firms increase their production to meet new demand. Finally output increase.

1 ↑ ⟹ Z ↑ ⟹ y ↑

QUESTION 2/VRAAG 2 (5 marks/5 punte)

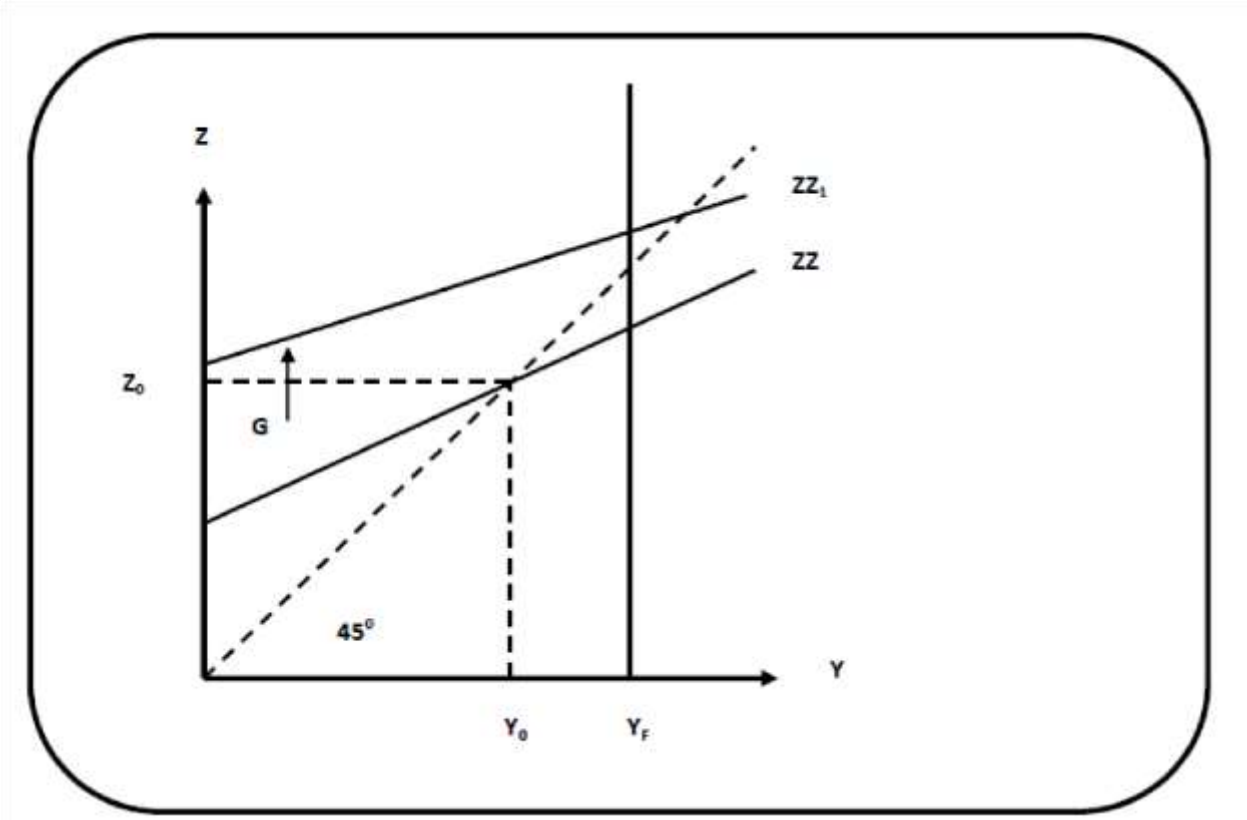
Use the following goods market model to illustrate and explain how government spending and taxation measures can be used during an economic recession to increase the level of output and income Clearly indicate any shift and/or movement on the diagram

Maak gebruik van die onderstaande goederemarkmodel om te illustreer en te verduidelik hoe owerheidsbesteding- en belastingmaatstawwe tydens 'n ekonomiese resessie gebruik kan word om die produksie- en inkomepeil te verhoog Toon duidelik enige verskuiwing en/of beweging op die diagram aan



An increase in government spending, will raise total demand. The firms will respond by raising production and output increases. By chain of events:

G ↑ ⇒ Z ↑ ⇒ y ↑



SECTION B

QUESTION 1/VRAAG 1 (15 marks/15 punte)

a Use the goods market model to explain the impact of an increase of 50 in government spending and an increase of 50 in taxes on the level of output and income. Illustrate any shift and/or movement on the diagram below and show all your calculations (6)

Question 1 (a)

Refer to Nov 2012 , Section A, Question 3

Nov 2013

QUESTION 1/VRAAG 1 (2 marks/2 punte)

Distinguish between financial investment and real investment (2)

Onderskei tussen finansiele investering en reele investering (2)

Question 1

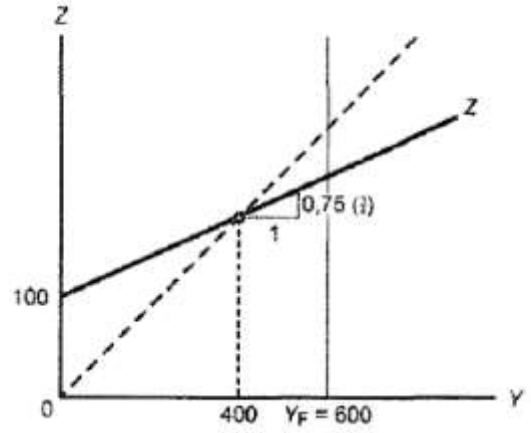
Financial investment involves investment in financial assets such as shares and bonds. This does not create production capacity.

Real Investment is spending on additions to the capital stock (machinery, structures, inventories)

QUESTION 5/VRAAG 5 (6 marks/6 punte)

1 Use the following goods market model to explain how government spending can be used to ensure full employment Comment on the size of government spending needed to reach full employment (5)

1 Gebruik die onderstaande goederemarkmodel om te verduidelik hoe owerheidsbesteding gebruik kan word om volle indiensneming te verseker Lewer kommentaar op die grootte van owerheidsbesteding wat nodig is om volle indiensneming te bereik (5)



Question 5

(i) Increase in government spending needed to reach full employment (Δ G)

Income Gap = 600 – 400 = 200

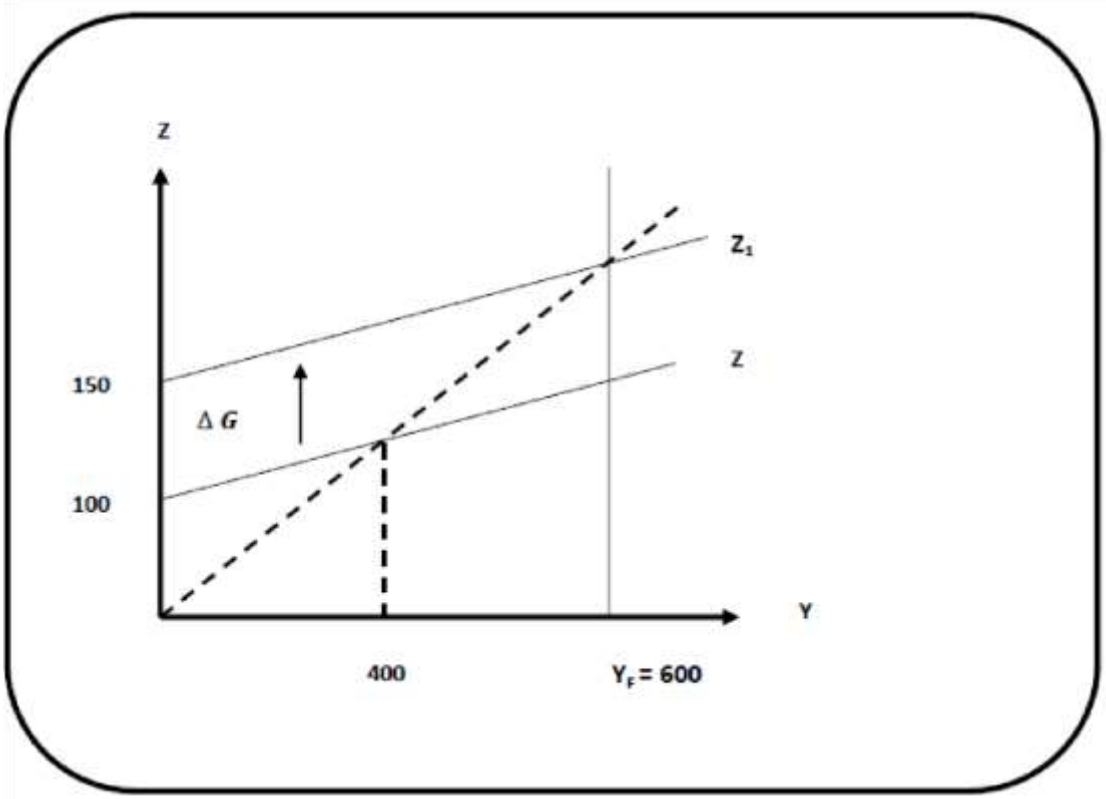
$$\propto = \frac{1}{1-3/4} = 4$$

$$y = \propto \bar{Z}$$

$$200 = 4\ \Delta\ G$$

$$\frac{200}{4} = \Delta\ G$$

$$\Delta\ G = 50$$



ii Name one other fiscal policy instrument to ensure full employment Indicate the direction of change (1)

(ii) The other instrument is a decrease in taxation.

FINANCIAL MARKETS

The money market is an economic model describing the supply and demand for money in a nation. Consumers and businesses have a demand for money, including

cash and checking and savings accounts, and they use financial institutions for this purpose. Economists illustrate money demand using a demand curve, just like they do in the market for products and services.

Wealth

In this financial market model, there are two ways in which financial wealth can be kept -namely in bonds (for instance treasury bills and/or money). By keeping your financial wealth in the form of bonds, you will earn interest on it. Keeping it in the form of money you earn no interest at all. The opportunity cost of holding your financial wealth in the form of money is therefore the interest that you could have earned by keeping it in bonds. The higher the interest rate, the higher the opportunity cost of holding money and the less money people would wish to hold as an asset. At a high interest rate, people will switch from money to bonds - and they therefore demand a lower quantity of money. A negative or inverse relationship therefore exists between the interest rate and the quantity of money demanded. The higher the interest rate, the lower the quantity of money demanded and the lower the interest rate, the higher the quantity of money demanded.

Money Demand

The demand curve for money illustrates the quantity of money demanded at a given interest rate. Notice that the demand curve for money is downward sloping, which means that people want to hold less of their wealth in the form of money the higher that interest rates on bonds and other alternative investments are.

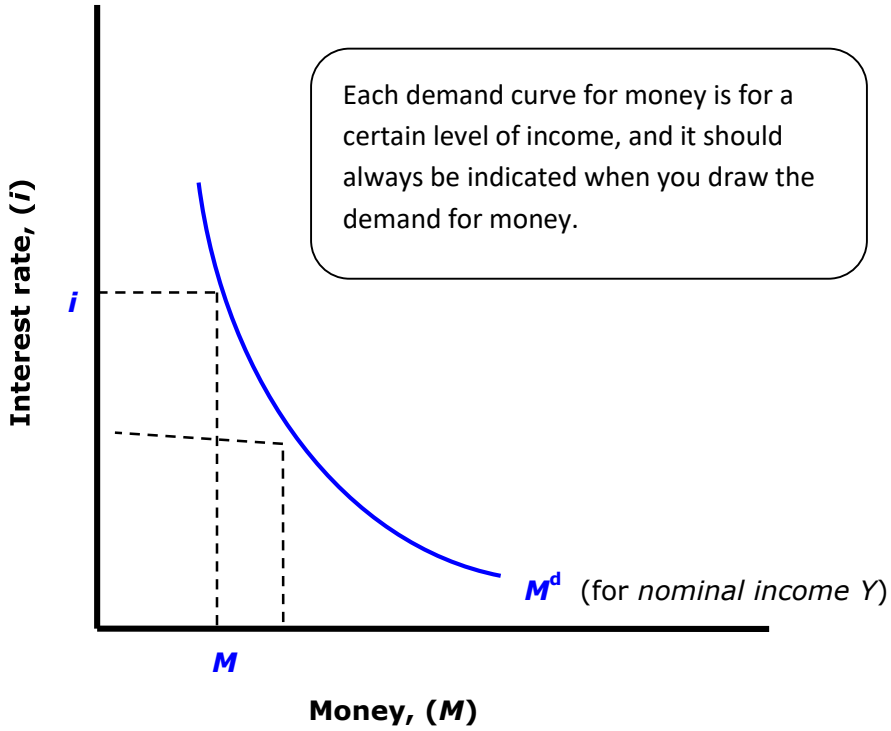
Factors of money demand

The demand for money is influenced by two factors - namely the level of output "Y" and the interest rate "i". Between the demand for money and the level of output, a positive relationship exists. If the level of output increases, the demand for money increases as well, and if the level of output decreases, the demand for money decreases. Between the demand for money and the interest rate, a negative or

inverse relationship exists. An increase in the interest rate decreases the quantity of money demanded, and a decrease in the interest rate increases the quantity of money demanded. Let's first deal with the relationship between the level of output and the demand for money.

Interest Rates and the Demand for Money

There is negative relationship between interest rates and money demand. This is why we have a downward sloping demand curve as shown below. The quantity of money people hold to pay for transactions and to satisfy precautionary and speculative demand is likely to vary with the interest rates they can earn from alternative assets such as bonds. When interest rates rise relative to the rates that can be earned on money deposits, people hold less money. When interest rates fall, people hold more money. The logic of these conclusions about the money people hold and interest rates depends on the people's motives for holding money.

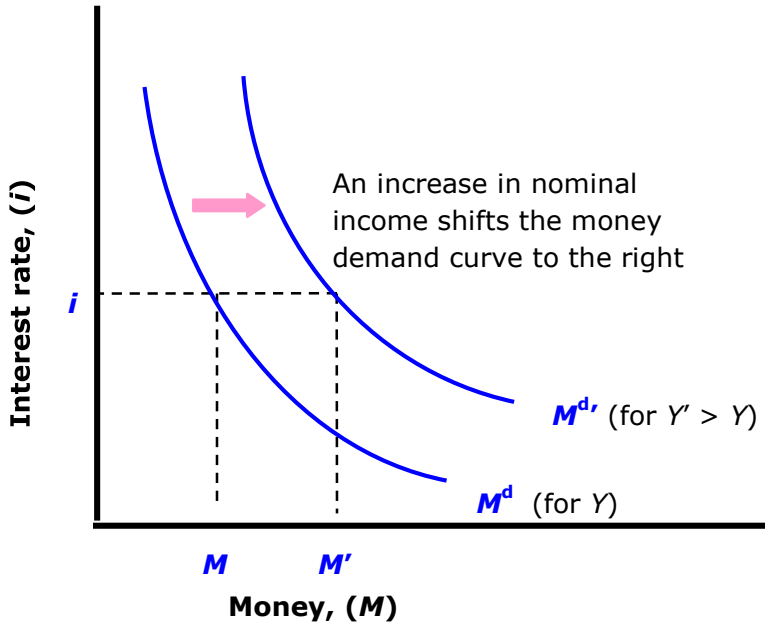


On the vertical axis the interest rate is measured, and on the horizontal axis the quantity of money demanded. The demand for money curve is downward sloping - indicating that a negative relationship exists between the interest rate and the

quantity of money demanded. An increase in the interest rate from "i1" to "i2" causes a decrease in the quantity of money demanded from "Md2" to "Md1" as people switch from money to bonds, while a decrease in the interest rate causes an increase in the quantity of money demanded as people switch from bonds to money. In other words - a change in the interest rate causes a movement along a given demand for money curve.

Income

There is positive relation between income and money demand. If income increases money demand will shift to the right.



Other Determinants of the Demand for Money

(these are not a focus of this module but might be worth knowing them)

We draw the demand curve for money to show the quantity of money people will hold at each interest rate, all other determinants of money demand unchanged. A change in those "other determinants" will shift the demand for money. Among the most important variables that can shift the demand for money are the level of income and real GDP, the price level, expectations, transfer costs, and preferences.

Real GDP

A household with an income of $10,000 per month is likely to demand a larger quantity of money than a household with an income of $1,000 per month. That relationship suggests that money is a normal good: as income increases, people demand more money at each interest rate, and as income falls, they demand less.

An increase in real GDP increases incomes throughout the economy. The demand for money in the economy is therefore likely to be greater when real GDP is greater.

The Price Level

The higher the price level, the more money is required to purchase a given quantity of goods and services. All other things unchanged, the higher the price level, the greater the demand for money.

Expectations

The speculative demand for money is based on expectations about bond prices. All other things unchanged, if people expect bond prices to fall, they will increase their demand for money. If they expect bond prices to rise, they will reduce their demand for money.

The expectation that bond prices are about to change actually causes bond prices to change. If people expect bond prices to fall, for example, they will sell their bonds, exchanging them for money. That will shift the supply curve for bonds to the right, thus lowering their price. The importance of expectations in moving markets can lead to a self-fulfilling prophecy.

Expectations about future price levels also affect the demand for money. The expectation of a higher price level means that people expect the money they are holding to fall in value. Given that expectation, they are likely to hold less of it in anticipation of a jump in prices.

Expectations about future price levels play a particularly important role during periods of hyperinflation. If prices rise very rapidly and people expect them to continue rising, people are likely to try to reduce the amount of money they hold, knowing that it will fall in value as it sits in their wallets or their bank accounts. Toward the end of the great German hyperinflation of the early 1920s, prices were doubling as often as three times a day. Under those circumstances, people tried not to hold money even for a few minutes—within the space of eight hours money would lose half its value!

Transfer Costs

For a given level of expenditures, reducing the quantity of money demanded requires more frequent transfers between non-money and money deposits. As the cost of such transfers rises, some consumers will choose to make fewer of them. They will therefore increase the quantity of money they demand. In general, the demand for money will increase as it becomes more expensive to transfer between money and non-money accounts. The demand for money will fall if transfer costs decline. In recent years, transfer costs have fallen, leading to a decrease in money demand.

Preferences

Preferences also play a role in determining the demand for money. Some people place a high value on having a considerable amount of money on hand. For others, this may not be important.

Household attitudes toward risk are another aspect of preferences that affect money demand. As we have seen, bonds pay higher interest rates than money deposits, but holding bonds entails a risk that bond prices might fall. There is also a chance that the issuer of a bond will default, that is, will not pay the amount specified on the bond to bondholders; indeed, bond issuers may end up paying nothing at all. A money deposit, such as a savings deposit, might earn a lower yield, but it is a safe yield. People's attitudes about the trade-off between risk and yields

affect the degree to which they hold their wealth as money. Heightened concerns about risk in the last half of 2008 led many households to increase their demand for money.

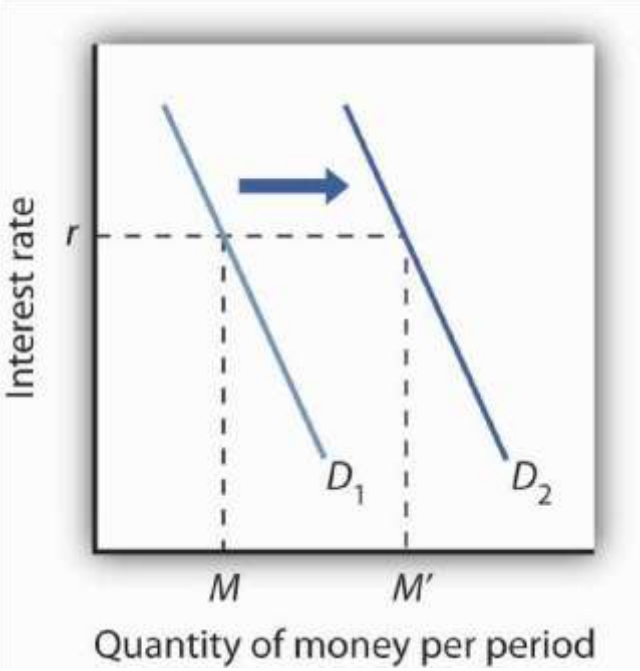
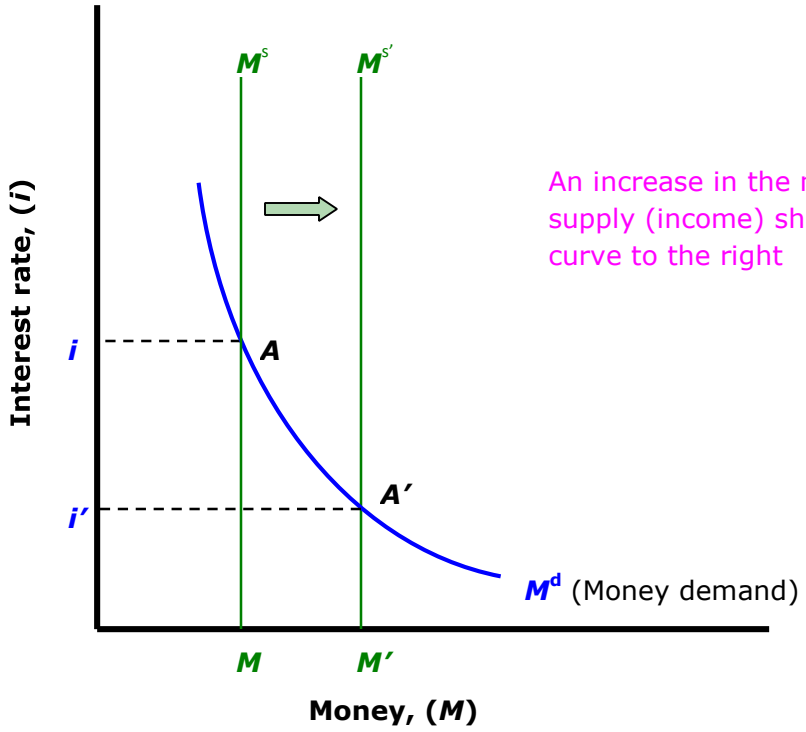


Figure "An Increase in Money Demand" shows an increase in the demand for money. Such an increase could result from a higher real GDP, a higher price level, a change in expectations, an increase in transfer costs, or a change in preferences

Equilibrium in financial markets and the impact of monetary policy

If the central bank wishes to decrease the money supply in order to increase the interest rate in the financial market, it must convince financial market participants to switch from money to Treasury bills. This requires a lower price for Treasury bills which implies a higher interest rate.

In the graph below, the effects of an increase in the money supply on the interest rate is shown. The initial equilibrium is at point ***A***, with an interest rate, ***i***. An increase in the money supply, from $M^s = M$ to $M^{s'} = M'$, leads to a shift of the money supply curve to the right, from M^s to $M^{s'}$. The equilibrium moves from ***A*** down to ***A'***, and the interest rate decreases from ***i*** to ***i'***.



An increase in the money supply (income) shifts the curve to the right

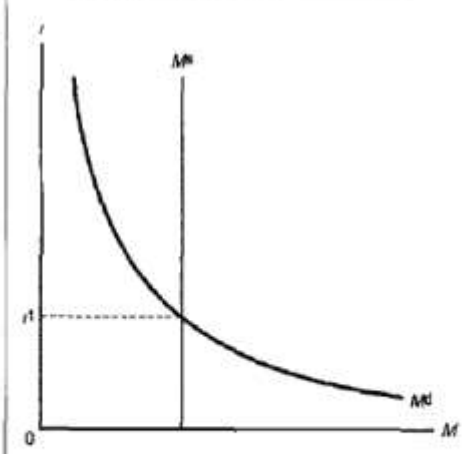
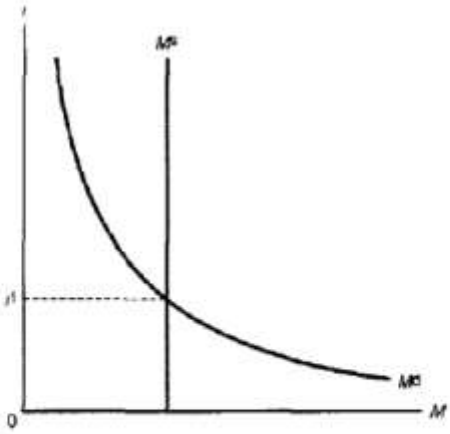
PRACTICE OF THE CONCEPT FROM PAST PAPERS

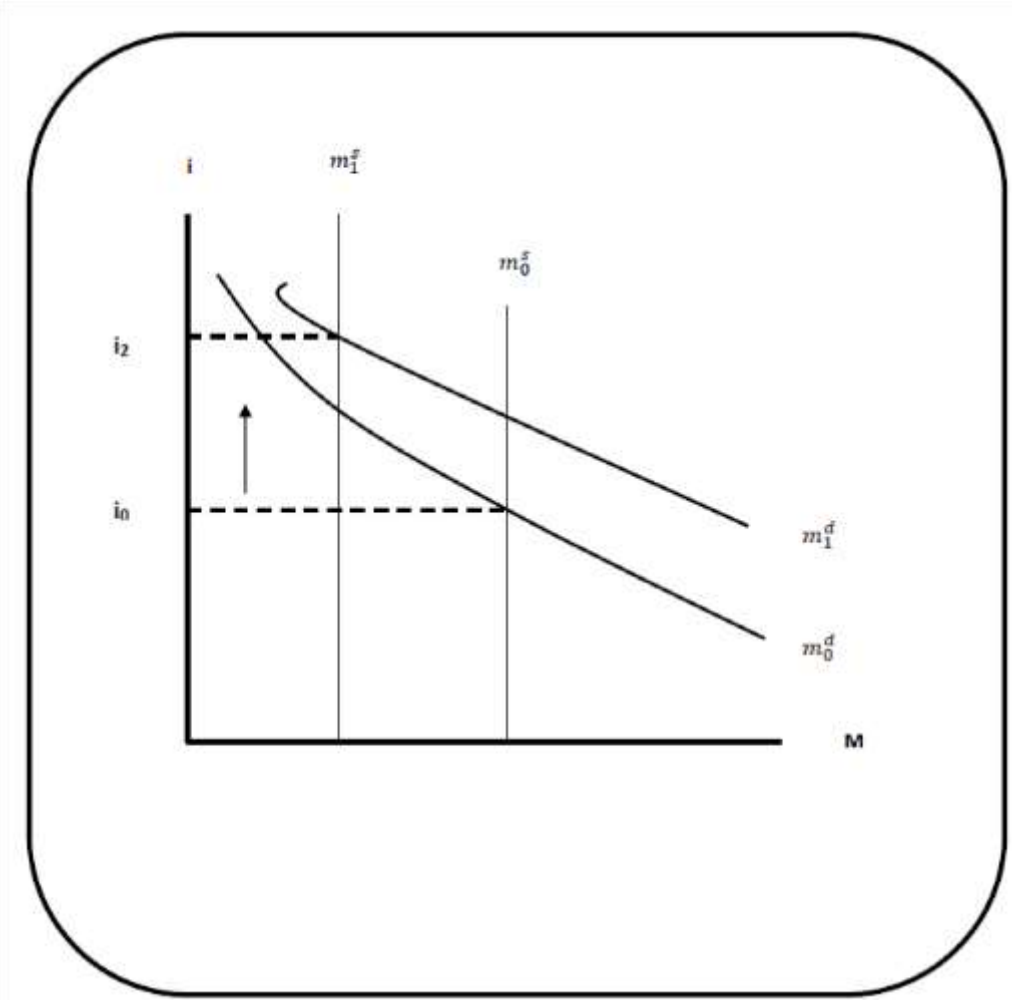
May 2012

QUESTION 3/VRAAG 3 (6 marks/6 punte)

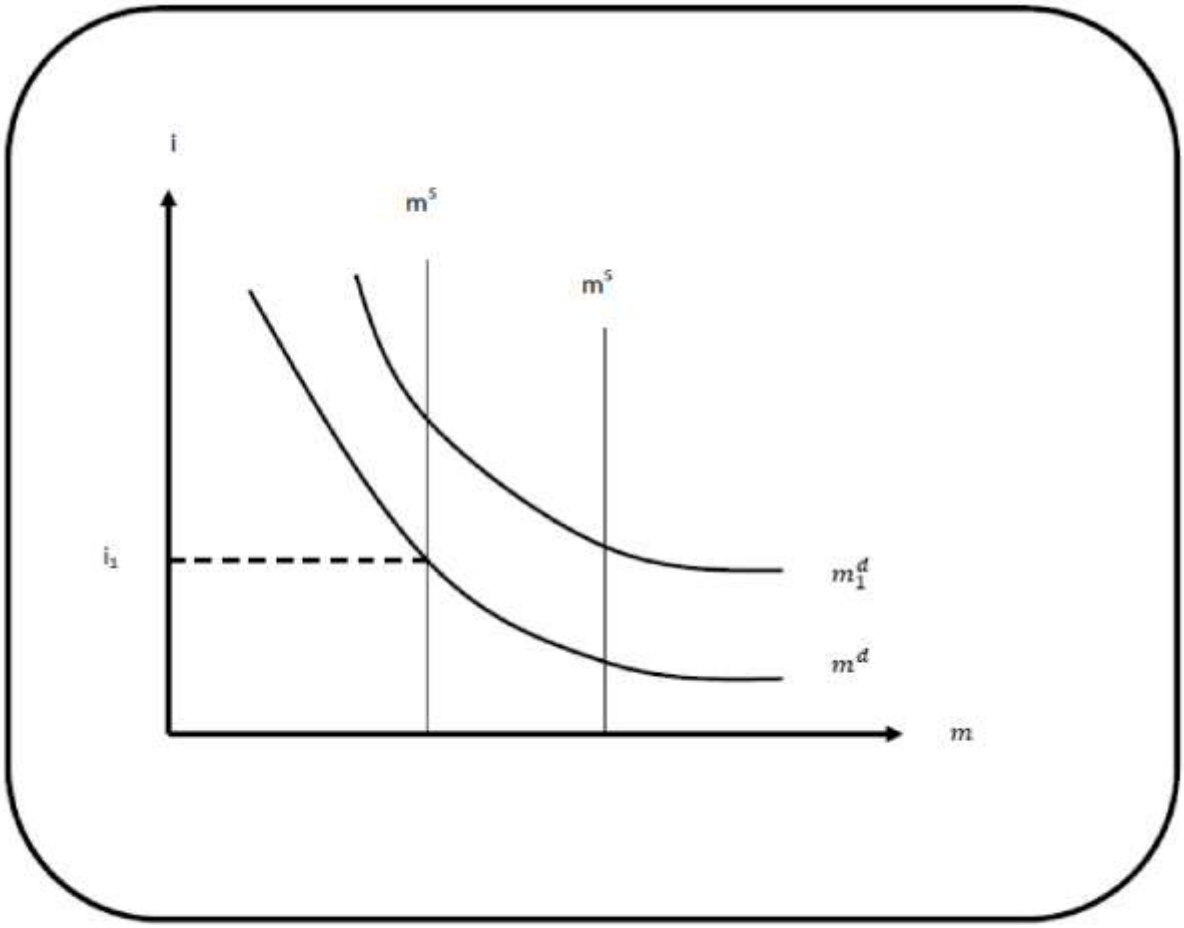
Use the following diagrams of the financial market to illustrate and explain the impact on the equilibrium interest rate (6)

Maak gebruik van die volgende diagramme van die finansiele mark om die impak op die ewewigsrentekoers te illustreer en te verduidelik (6)

(a) An increase in income with simultaneous contractionary open market operations by the central bank 'n Toename in inkome met gelyktydige beperkende opemarkbedrywighede deur die sentrale bank	(b) An increase in income with simultaneous expansionary open market operations by the central bank 'n Toename in inkome met gelyktydige ekspansionistiese opemarkbedrywighede deur die sentrale bank
	
Impact on the equilibrium interest rate: Impak op die ewewigsrentekoers:	Impact on the equilibrium interest rate: Impak op die ewewigsrentekoers:



(b) Impact : increase equilibrium interest rate



Impact : Uncertain on interest rate.

Nov 2012

No question on financial market.

May 2013

No long question about financial market.

Nov 2013

QUESTION 2/VRAAG 2 (2 marks/2 punte)

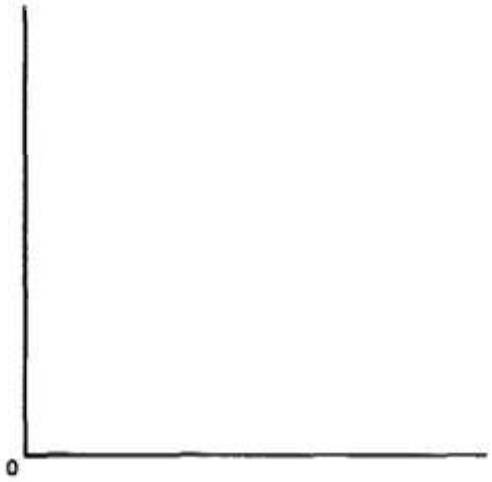
Briefly describe the impact an increase in the interest rate has on the demand for money curve (2)

Increase in interest rate will cause an upward movement along money demand curve. If interest rate increase the quantity of money demanded decreases.

QUESTION 6/VRAAG 6 (6 marks/6 punte)

Use the financial market model to explain what happens to the interest rate if income increases and the money supply decreases (6)

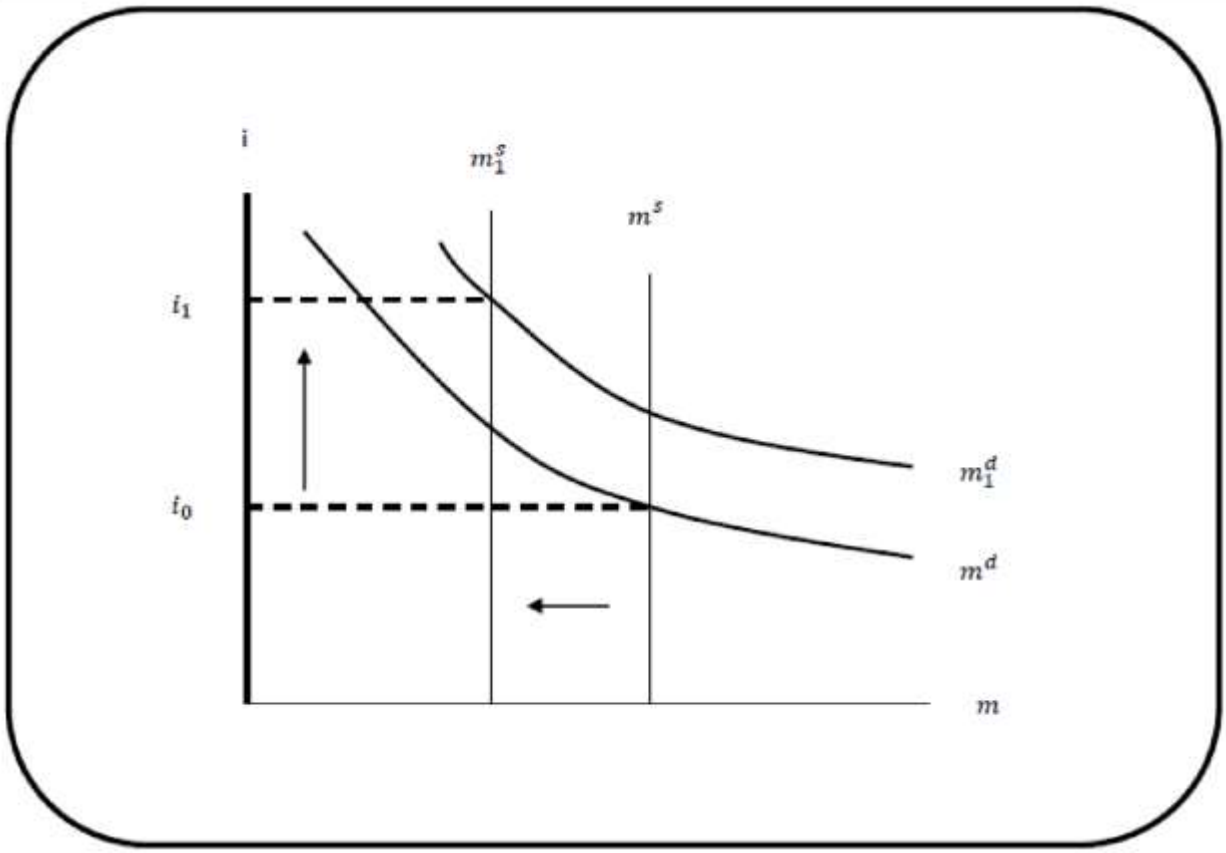
Gebruik die finansiele markmodel om te verduidelik wat gebeur met die rentekoers indien inkome styg en die geldvoorraad daal (6)



The impact is a definite increase in interest rate because both have impact of raising interest as on these chains of events:

Y ↑ ⟹ m^d ↑ ⟹ i ↑

m^s ↓ : s_b ↑ ⟹ P_B ↓ ⟹ i ↑



IS-LM MODEL

The **IS–LM model** (**I**nvestment **S**aving–**L**iquidity Preference **M**oney Supply) is a macroeconomic tool that demonstrates the relationship between interest rates and real output, in the goods and services market and the money market. The intersection of the IS and LM curves is the "general equilibrium" where there is simultaneous equilibrium in both markets. (Source Wikipedia)

The **IS/LM model** is a macroeconomic tool that demonstrates the relationship between interest rates and real output in the goods and services market and the money market. The intersection of the IS and LM curves is the "General Equilibrium" where there is simultaneous equilibrium in both markets.[1] IS/LM stands for Investment Saving / Liquidity preference Money supply. (Source: www.princeton.edu)

The IS/LM model was born at the econometric conference held in Oxford during September, 1936. Roy Harrod, John R. Hicks, and James Meade all presented papers describing mathematical models attempting to summarize John Maynard Keynes' *General Theory of Employment, Interest, and Money*. Hicks, who had seen a draft of Harrod's paper, invented the IS/LM model (originally using the abbreviation "LL", not "LM"). He later presented it in "Mr. Keynes and the Classics: A Suggested Interpretation" (source: investopedia)

Model for a closed economy

First assume that the economy is closed. This will help us better understand the basic model; later we will proceed with the more complicated version when there are International transactions on goods and capital.

IS

The total supply of goods in an economy is what we call output: *Y*. The total demand is what the agents do with all those goods: either they consume (*C*), invest (*I*), or the government consumes them (*G*). Imposing the fact that the supply of goods is equal to the demand of goods requires:

$Y=C+G+I$

We can rearrange this equation such that we equate savings to investment

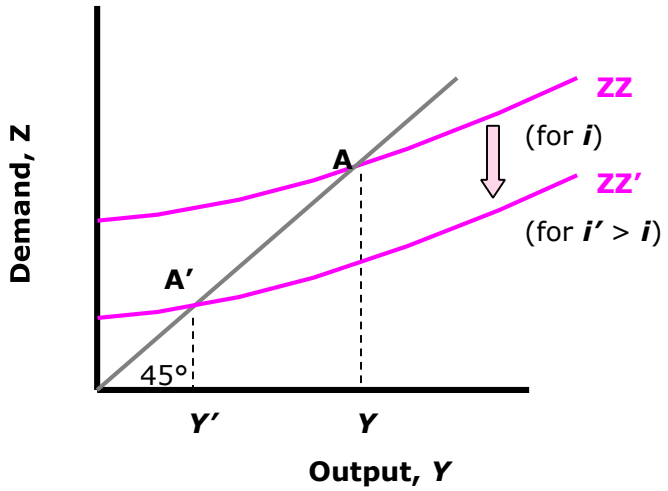
Y-C-G=I

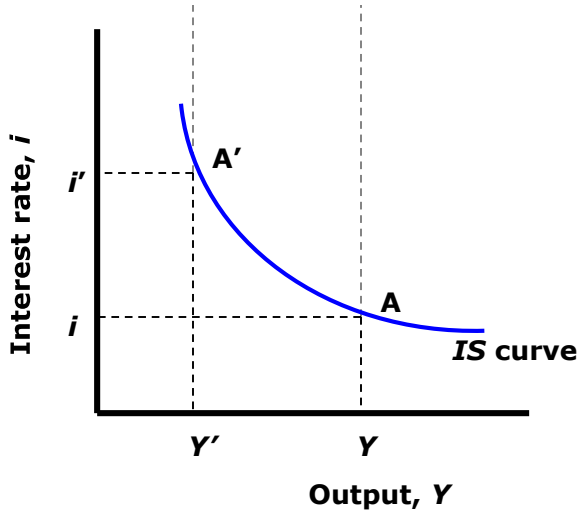
As can be seen, on the left-hand side we have the total income generated (*Y*) in the economy minus the expenses (*C+G*). This reflects the savings made by consumers and government. On the other hand, the right hand side is the investment. Isn't this interesting? When we impose that the supply of goods has to be equal to the demand of goods, immediately it has the implication that total savings are equal to investment.

This represents the IS in the model.

Deriving the IS curve

What happens when the interest rate changes? An increase in the interest rate causes a decrease in investment spending, this leads to a decrease in output which further decreases consumption and investment, through the multiplier effect.

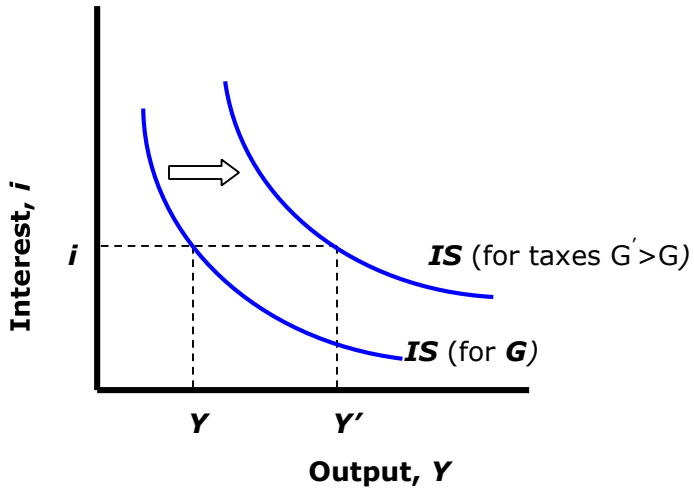




Equilibrium in the goods market implies that an increase in the interest rate leads to a decrease in output. This relation between the interest rate and the output is represented by a downward-sloping curve called the ***IS* curve**.

The effect of an increase in government spending G.

Let's see how a change in the exogenous government spending G leads to a shift to the right of the entire IS curve: intuitively, a higher G will spur the economy and shift the IS curve out.



Equilibrium in the goods market implies that an increase in the interest rate leads to a decrease in output.

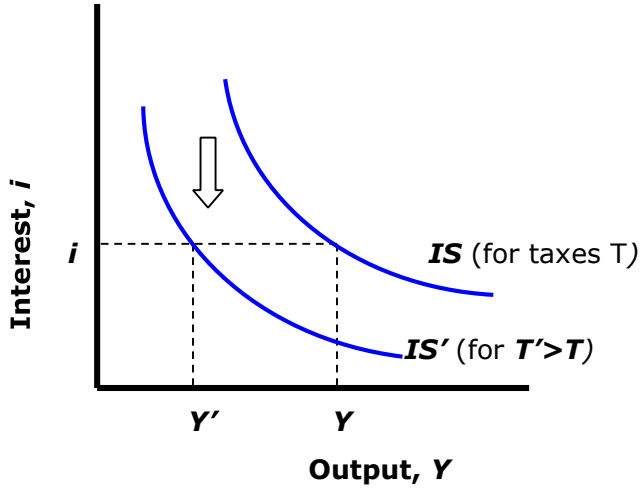
This relation between the interest rate and the output is represented by a downward-sloping curve called the ***IS* curve**.

What happens when we increase G from G to G'? The national supply of savings is reduced as public savings fall with the increase in G. This reduction in national

savings leads, for the initial income Y', to a higher rate of interest r'' In fact, for any level of initial income Y, a higher G leads to lower savings and higher interest rates. So the IS' curve shifts up or, what amounts to the same thing, shifts to the right to the new IS'' curve in the right side.

The effect of an increase in taxes T

You might guess that this shifts the IS curve to the left or down and you'd be right .as shown in diagram below. An increase in taxes T (from T' to T'') has the following effects. First, it leads to an increase in public savings (a reduction in the budget deficit) that causes a shift to the right of the curve S representing total national savings. However, the increase in taxes reduces disposable income (Y-T) and causes a reduction in private savings; this is the shift of the savings curve to left side. On net, the increase in taxes leads to a increase in national savings; an increase in taxes by one dollar increases public savings by one dollar but reduces private savings only by the marginal propensity to save out of income. Such marginal propensity to save is (1-c)<1, i.e. one minus the marginal propensity to consume. For example if b=0.8, the marginal propensity to save is (1-c)=0.2; so a fall in disposable income of one dollar (because of higher taxes) reduces private savings by 20 cents. Since private savings fall less than the increase in public savings, total savings go up as shown by the move of the savings function.



The higher savings cause a reduction in the interest rate and an increase in national investment. In fact, for any level of the initial income Y, a higher T leads to higher savings and lower interest rates. So the IS curve shifts down or, what amounts to the same thing, shifts to the left to the new IS'' curve in the right side.

LM

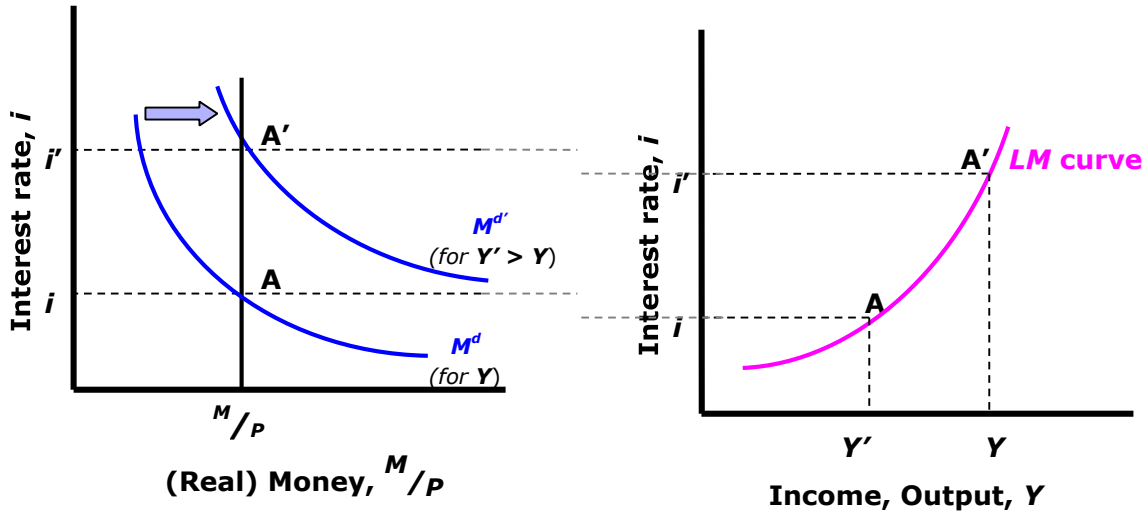
Now let's concentrate on the other market: the equilibrium on the monetary side. Assume there are only two assets: currency and government bonds. Money does not earn interest, but the government bonds carry the market interest rate: *i*. Currency, however, has a role in the economy given that it allows people to perform transactions that otherwise could have not been implemented (pay cabs, buy coffee, etc.)

We assume the supply of currency is determined by the central bank: *M*. The demand for currency is then determined by what the consumers decide to do with their holdings. We assume consumers solve a portfolio problem and allocate part of their wealth (which is proportional to income: *Y*) as currency and the rest is saved in bonds.

We should expect two things: first, when the interest rate increases a smaller proportion is held in currency. The intuition is that the opportunity cost of holding cash increases and individuals should shift part of their portfolio toward bonds. Second, when wealth increases individuals should hold more cash. In other words, the shares assigned to money might change with increases in wealth but not in such a way that will overcome the initial impact.

In other words, we should expect that an increase in the interest rate reduces the demand for money, and that an increase in output will increase the demand for money. You can think of this demand as a transactional demand for money. The more transactions there are, the larger the cash required to perform them.

Derive the LM Curve

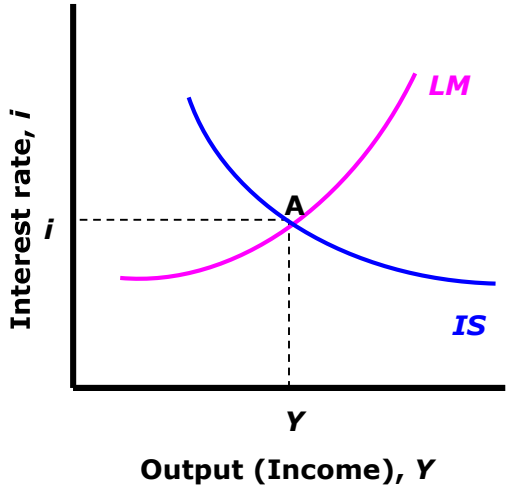


IS-LM: The model

Let's now put both schedules together. As any respectable model in economics, there is a downward and an upward schedule. And as it should be expected, they intersect once, and we tend to like this point. This model indicates what is the unique combination of output and interest rates that is consistent with both equilibrium in the goods market and equilibrium in the money market.

In this model, I have depicted how the schedules move when there is a change in fiscal or monetary variables. The arrows reflect how the curves move when there is an increase in the variable highlighted. In summary, an expansionary monetary policy reduces the interest rate and increases output in the short run. On the other hand, an expansionary fiscal policy (either an increase in expenditures or a tax-cut) increases the interest rate and output. Finally, a decrease in the marginal propensity to save (an increase in *c*) increases the interest rate and output.

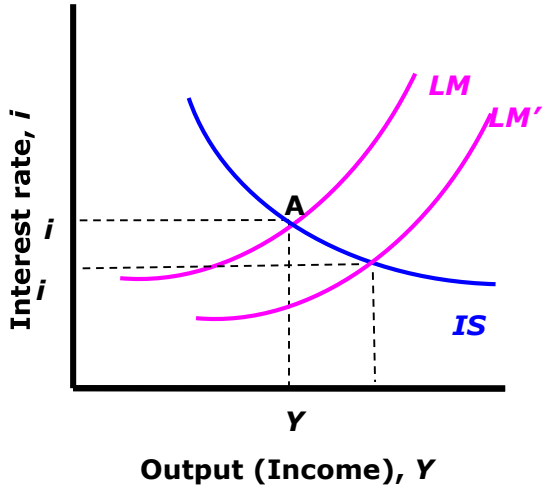
- Equilibrium in the Financial Markets implies that an increase in output leads to an increase in the interest rate. This is represented by the **LM curve**.
- Equilibrium in the Goods Markets implies that an increase in the interest rate, leads to a decrease in output. This is represented by the **IS curve**.
- The Financial and Goods market are in equilibrium only at point **A**, where the ***IS*** and ***LM*** curves intersect.



Impact of monetary and fiscal policy

Expansionary Monetary Policy

An expansionary monetary policy occurs when the money supply increases. This can occur through the buying of bonds (treasury bills) by the monetary authorities. There are two important steps in the monetary transmission mechanism. The first step deals with the impact of monetary policy on the financial market where it creates portfolio disequilibrium and the second step with the impact a change in the interest rate have on the demand for goods and the equilibrium level of output and income on the goods market.



Impact on the financial market

Through its open market operations the monetary authorities purchases bonds in exchange for money, thus increasing the money supply. In the financial market an increase in the nominal money supply shifts the real money supply curve M/P to the right to M_1/P. An excess supply of money develops and a portfolio disequilibrium exists. Too get rid of this excess supply of money wealth holders adjust their portfolios by starting to buy bonds. The increased demand for bonds raises the price of bonds and, as a result, the interest rate falls.

In the IS-LM model this is represented by a downward shift of the LM curve.

Impact on the goods market

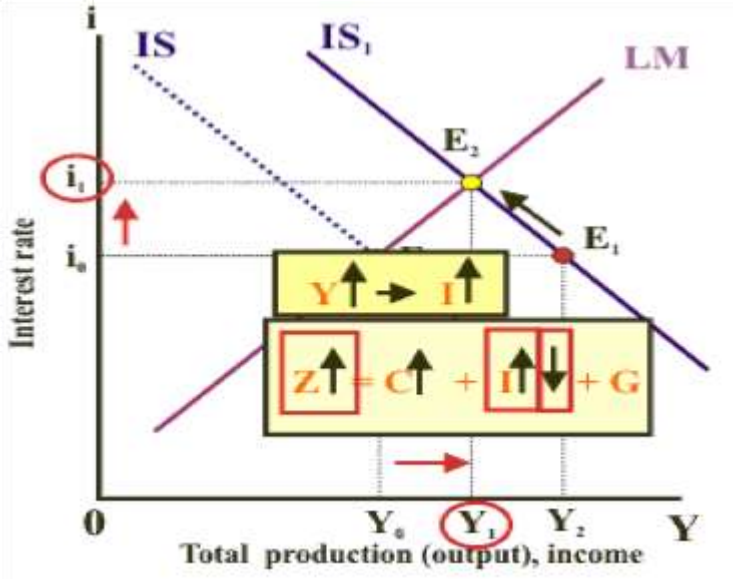
On the goods market the decrease in the interest rate causes an increase in the level of investment spending. The increase in investment spending causes an increase in the demand for goods and the level of output and income rises. This increase in the level of output causes a further increase in investment and a higher equilibrium level of output and income is reached on the goods market.

In the IS-LM model this is represented by a movement along the IS curve.

Fiscal Policy

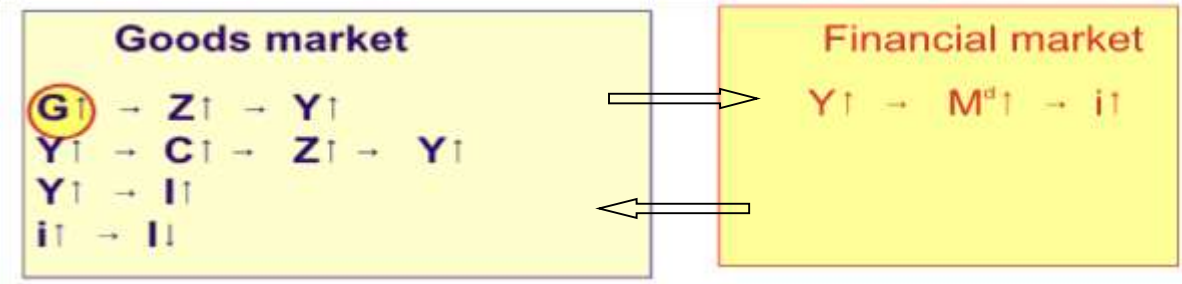
Expansionary fiscal policy

An expansionary fiscal policy occurs when government spending increases and/or taxes decreases. Let's take case of a **decrease in taxation** and see how it affects the IS-LM model. The IS-LM model takes account of a goods market, shown as the IS curve, and a financial market shown as the LM curve. You first decision is which market is impacted first – is it on the goods market or the financial market? Fiscal policy impacts the goods market first while monetary policy the financial market first.



A clear similar diagram is in the study guide

Chain of events



Impact on the goods market

On the goods market lower taxation increases households' disposable income. Households react by increasing their consumption spending, thus increasing the demand for goods, since the demand for goods is equal to C + I +

G. On the goods market the demand for goods is therefore higher and the demand curve shifts upwards. Firms in turn react to this increase in demand by increasing their production and therefore income increases and the multiplier process is in operation. This increase in income also leads to an increase in investment spending since investment spending is a positive function of the interest rate.

In the IS-LM model this is represented by a rightward shift of the the IS-

curve. Initially the level of income increases to Y_2, given an interest rate of i_0. This increase in income is due to the higher demand for goods which is the result of higher consumption spending and investment spending.

However this is not the end of the story since changes are going to occur in the financial market.

Impact on the financial market

On the financial market the increase in production and income which occurred in the goods market causes an increase in the demand for money as more transactions are being done. The demand for money curve shifts to the right and the interest rate rises since the supply of money is fixed.

Back to the goods market

On the goods market the increase in the interest rate decreases investment spending since investment spending is a negative function of the interest rate. In the IS-LM model a movement from E_1 to point E_2 occurs and a new goods market and financial market equilibrium are reached with a higher interest rate and a higher level of output than before the decrease in taxation.

The end result

Comparing point E with point E_2 you can see that at point E_2 both the interest rate and level of output are **higher** than before the decrease in taxation. The interest rate is higher in keeping with a higher output that increases the demand for money. Output is higher due to a higher demand for goods. The demand function C + I + G shows a clear increase in consumption spending which is due to lower income taxation and the multiplier effect. Investment spending first increases, due to the increase in output, but then decreases, due to the increase in the interest rate. Which effect dominates is uncertain and the change in investment spending is indeterminate.

PRACTICE OF THE CONCEPT FROM PAST PAPERS

IS-LM MODEL

This section is the dominating part of the module and expect a lot from this topic in your examination.

May 2012

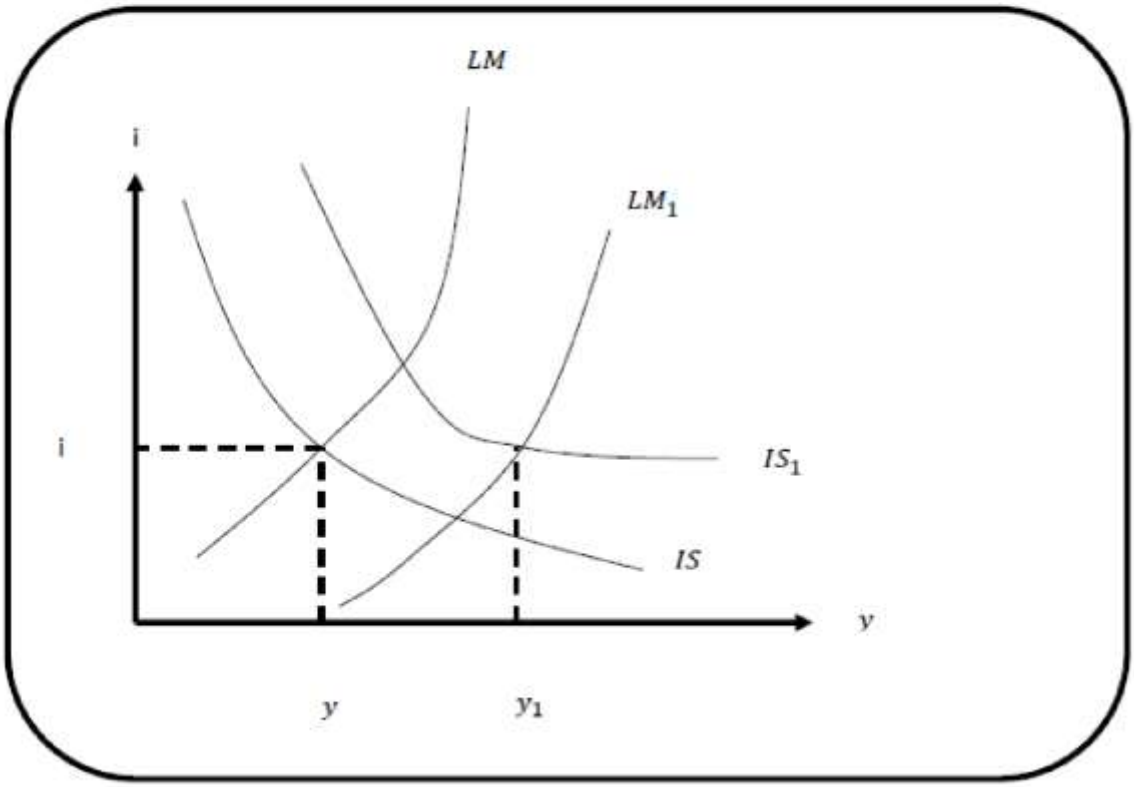
QUESTION 4/VRAAG 4 (8 marks/8 punte)

In response to the Great Recession many countries used monetary and fiscal policies in an attempt to deal with the impact of the recession on the level of output and income and unemployment Use the IS-LM model to eplain the impact of these policies on

1 the level of output and income
2 the budget balance of government
3 unemployment (8)

Question 4

The countries should make use of expansionary fiscal and monetary policies simultaneously. The impact is depicted by the diagram below.



1. Definitely the level of output will increase

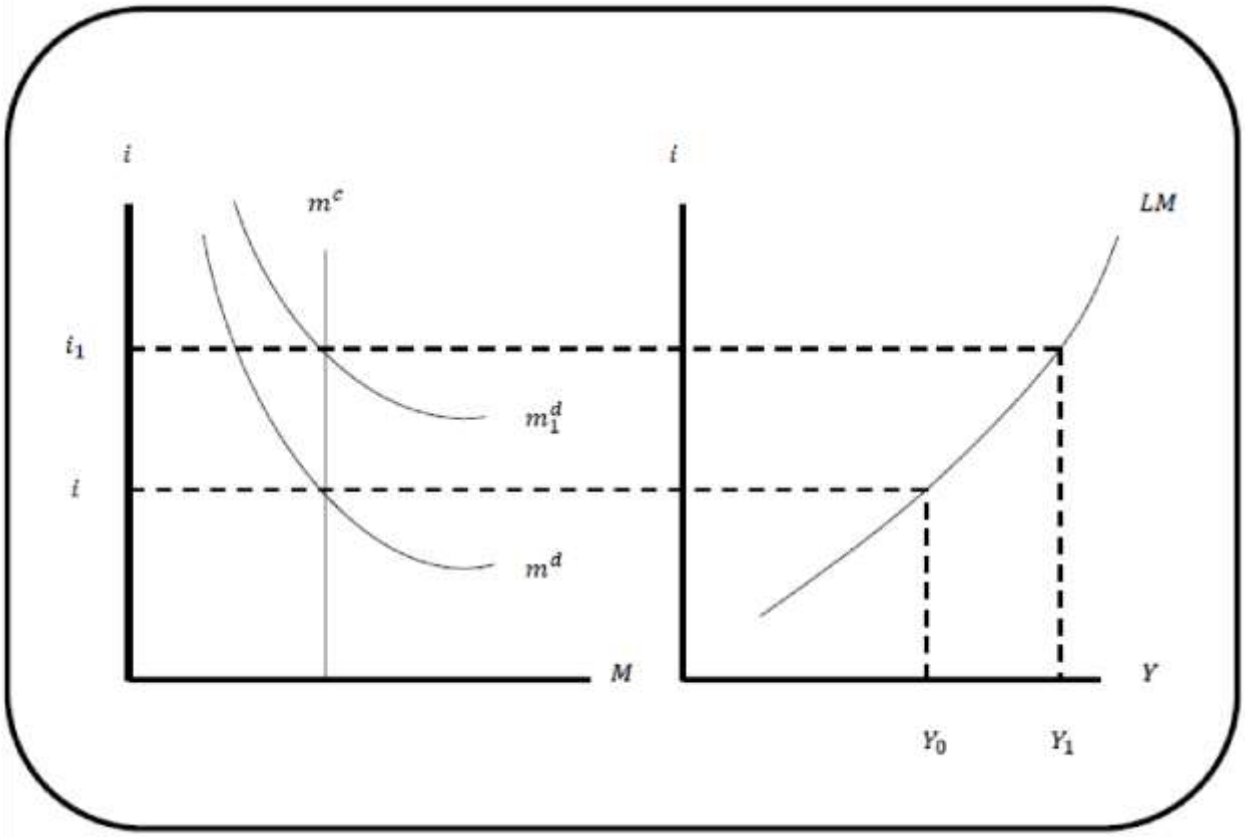
G ↑ ⟹ Z ↑ ⟹ Y ↑ (expansionary fiscal policy)

P_B Expansionery monetary policy shift LM to right

2. Expansionery Fiscalpolicy is most likely to increase budget deficit if taxes do not increase.
3. Unemployment will decrease as a result of increase in production and of increase in production and output.

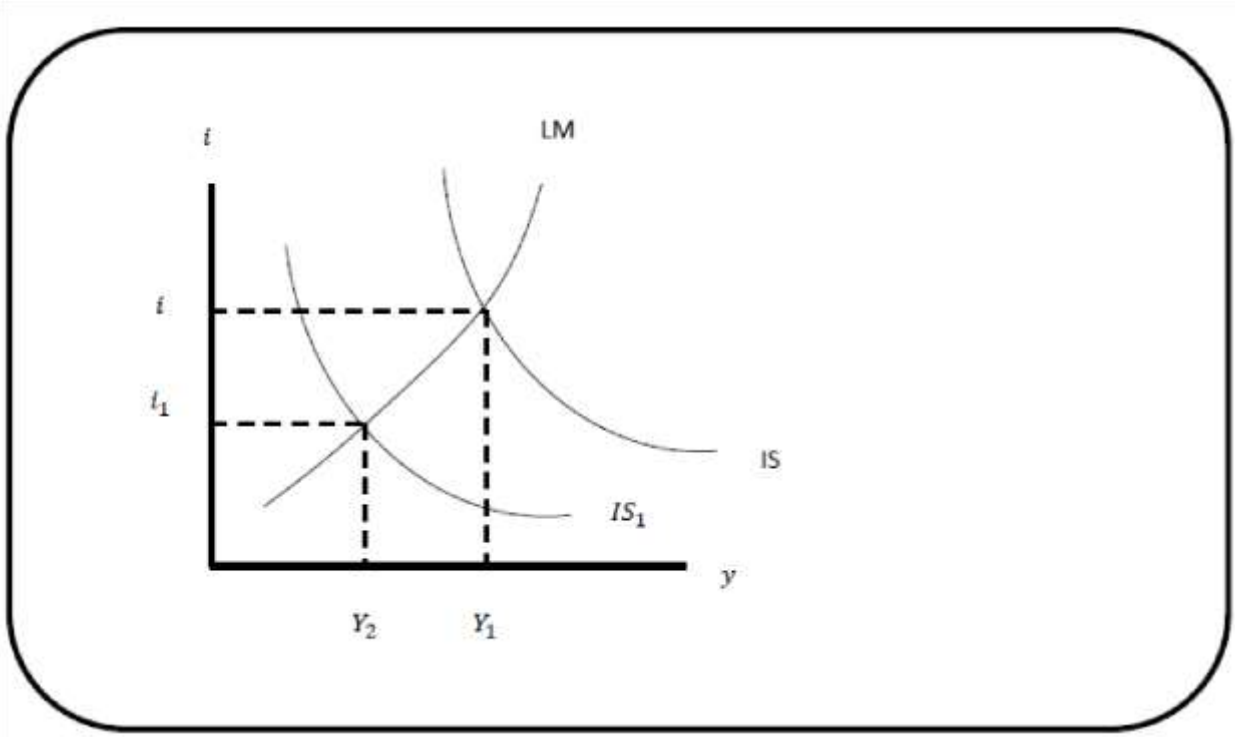
QUESTION 1/VRAAG 1 (15 marks/15 punte)

a Derive the LM curve by using appropriate diagrams and in words (6)
a Lei die LM-kromme af deur gebruik te maak van toepaslike diagramme en in woorde (6)



b Use an IS-LM model to compare the impact of a contractionary fiscal policy with that of an expansionary monetary policy (6)

Contractionary Monetary Policy



The impact can be summarised as :

Impact in goods market

T ↑ ⟹ Y_D ↓ ⟹ C ↓ ⟹ Z ↓ ⟹ Y ↓

A decline in output reduces investment because the level of sales decrease.

⟹ Y ↓ ⟹ I ↓

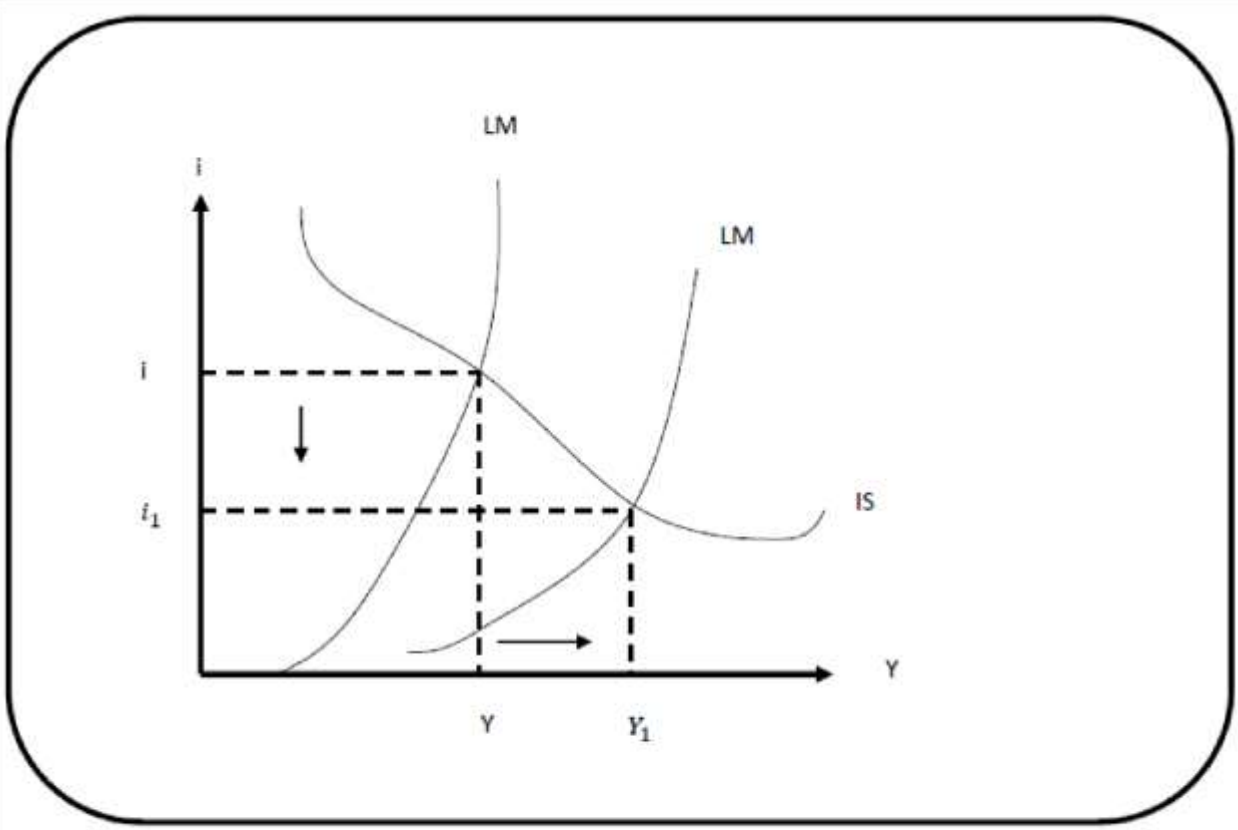
Impact on financial market

Decrease in output reduce demand for money and reduce interest rate also.

⟹ i ↓ ⟹ I ↑ ⟹ Z ↑ ⟹ Y ↑

End result

A decrease in interest rate and equilibrium output and income level.



Impact on financial market

m ↑ ⟹ $^{m}/_{p}$ ↑ ⟹ i ↓

Impact on goods market

⟹ i ↓ ⟹ I ↑ ⟹ Z ↑ ⟹ Y ↑

Y ↑ ⟹ I ↑

Y ↑ ⟹ C ↑

This is so through the multiplier process in operation

End result

Equilibrium level of output is higher and interest rate is lower.

c Use an events chain to eplain how the negative impact of a budget deficit reduction on the level of output can be counteracted by monetary policy in the IS-LM model (3)

(c) Expansionary monetary policy can be used to counter the effect: The chain of events is:

$M \uparrow \Rightarrow {}^{M}/_{P} \uparrow \Rightarrow i \downarrow$

$\Rightarrow i \downarrow \Rightarrow I \uparrow \Rightarrow Z \uparrow \Rightarrow Y \uparrow$

$Y \uparrow \Rightarrow I \uparrow$

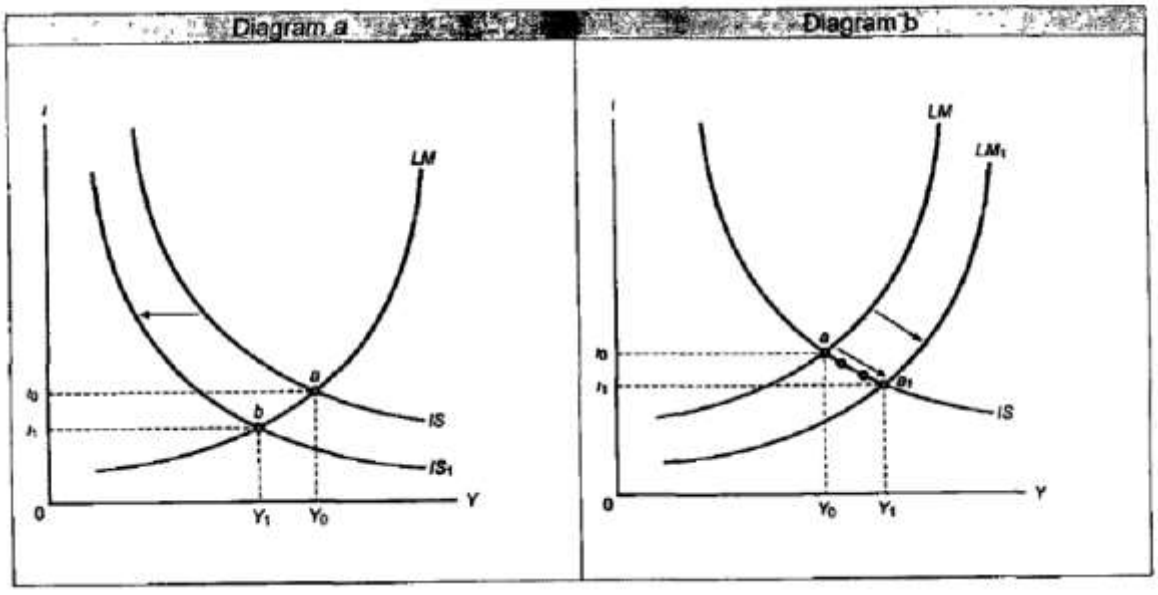
$Z \uparrow = C \uparrow + 1 \uparrow + G$ **(Page 94 study guide)**

Nov 2012

QUESTION 4/VRAAG 4 (5 marks/5 punte)

In diagram a the impact of a contractionary fiscal policy is illustrated while the impact of an expansionary monetary policy is illustrated in diagram b

In diagram a word die impak van 'n beperkende fiskale beleid geïllustreer terwyl die impak van 'n ekspansionistiese monetêre beleid in diagram b geïllustreer word



Question 4

(i) For contractionery fiscal policy interest rate is lower because, adecrease in government spending reduces total demand and output declines. A decrease in income reduce demand for money and interest rate falls.

For expansionary monetary policy, an increase in nominal money supply raise increase demand for bonds and price of bonds. Resultantly interest rate falls.

(ii) Impact on investment
Contractionary fiscal policy
Impact is indeterminate : decrease because Y is lower but increase because i is lower and Y is higher (page 98 study guide)

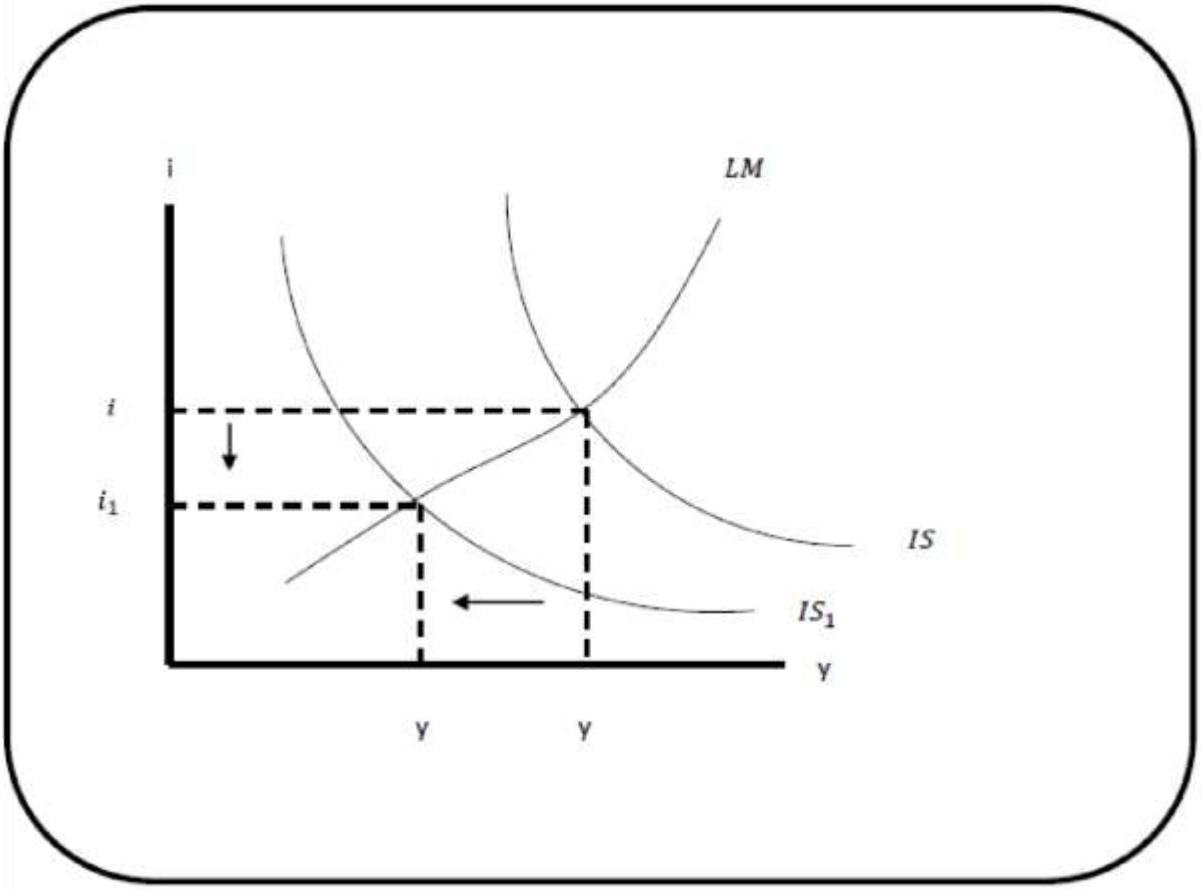
QUESTION 1/VRAAG 1 (15 marks/15 punte)

In 2009 policy makers in South Africa used fiscal and monetary policies to deal with the impact of the Great Reccesion on the South African economy

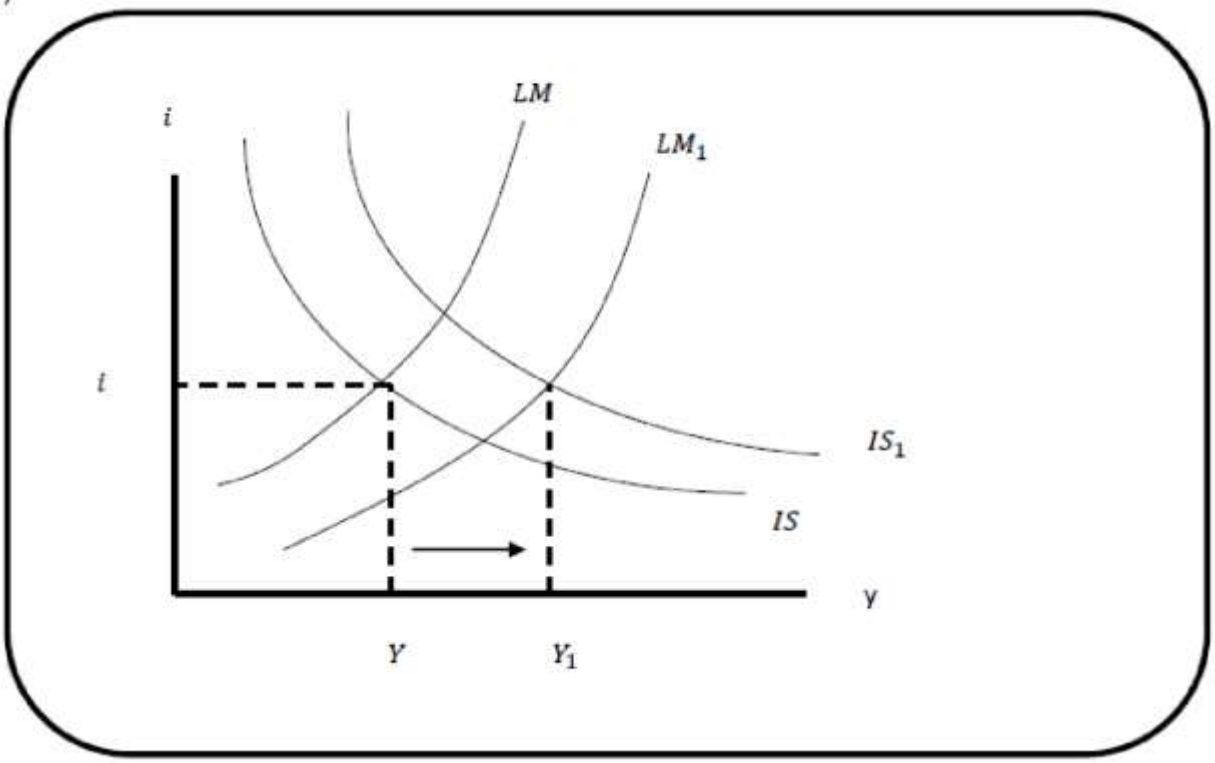
Use the IS-LM model to explain

(a) The impact of the Great Recession on the South African economy
(b) How fiscal and monetary policies were used to deal with this impact
(c) For some countries the Great Recession causes unsustainable budget deficits Use the IS-LM model to explain how these countnes can make use of fiscal and monetary policies to decrease the budget deficit and increase the level of output and income

Recession in economy reduces demand in the economy and is signalled by left shift of IS curve in IS – LM model.



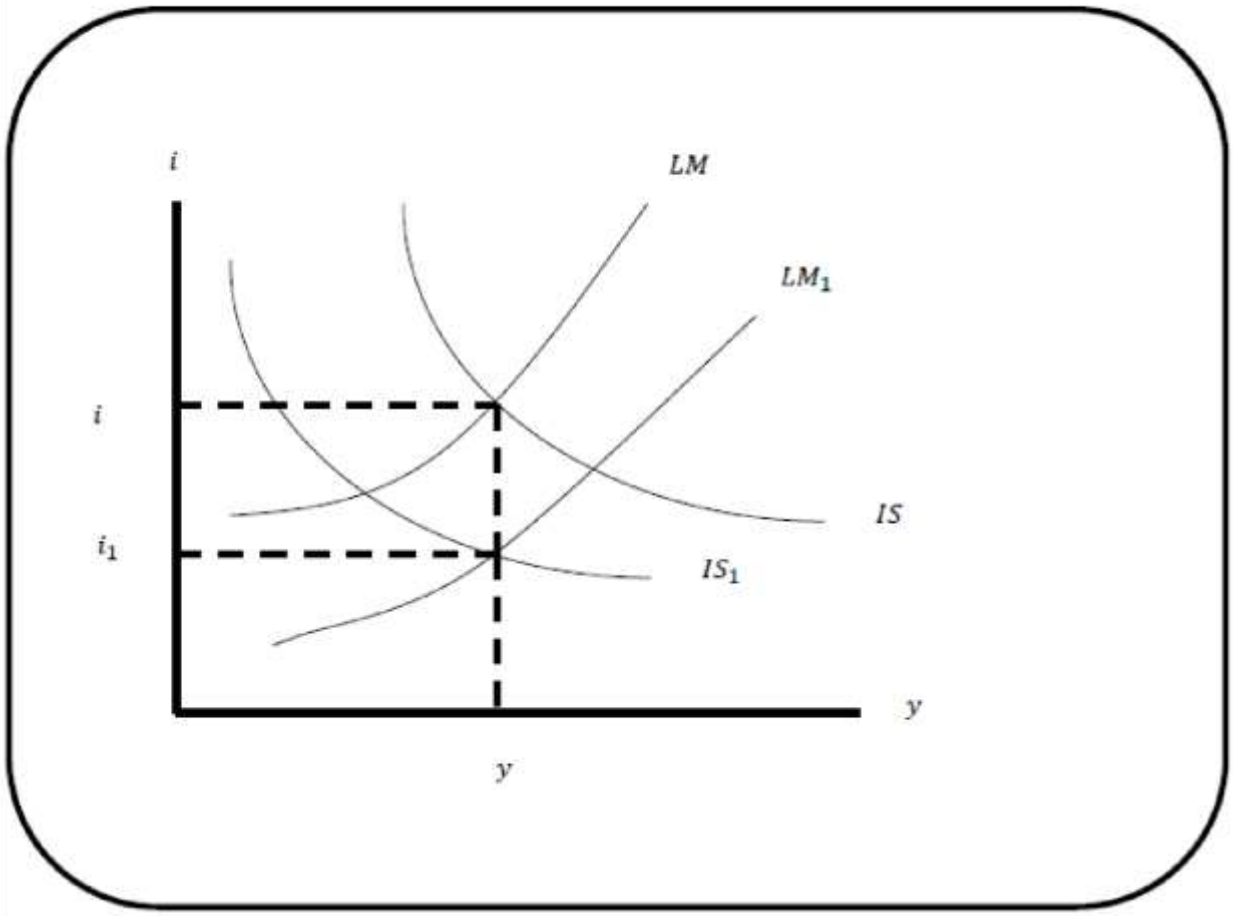
(b)



Make use of expansionary fiscal and monetary policies.

Impact of on interest rate is inderteminate,but income increases.

(c)



A mix of contractionery fiscal policy which reduce budget deficit and expansionary monetary policy to counter an initial decrease in output.

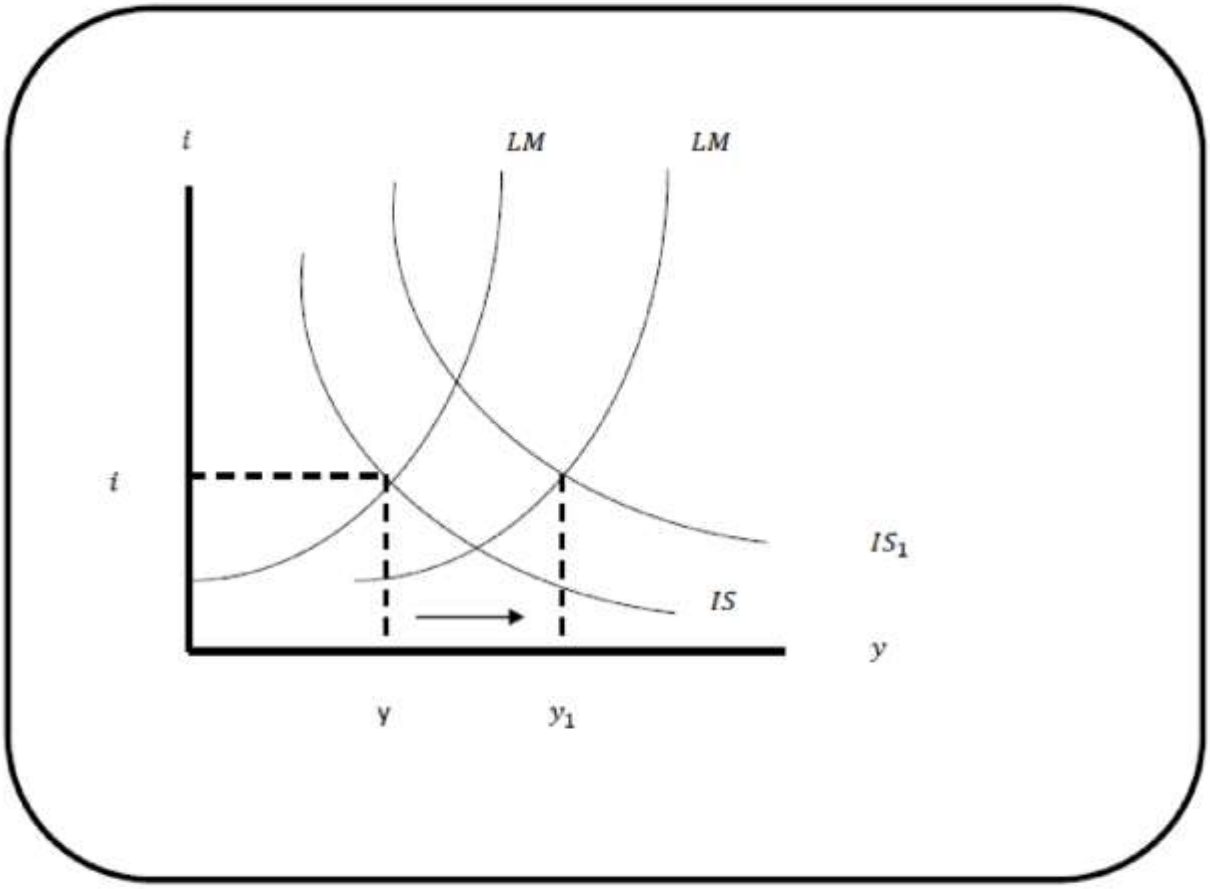
The end result on income is heavily depended on whether the economy is more sensitive to fiscal (demand) policy or the monetary policy. If its more sensitive to monetary changes then equilibrium income will increase.

May 2013

c Use an IS-LM model to explain how stabilisation polices can be used during an economic recession (6)

Question 1 (c)

Stabilising policies to be used are expansionary fiscal and monetary policies.



Definitely the end result is an increase in output and employ,ent. The impact of policies on interest rate is indeterminate.

QUESTION 2/VRAAG 2 (15 marks/15 punte)

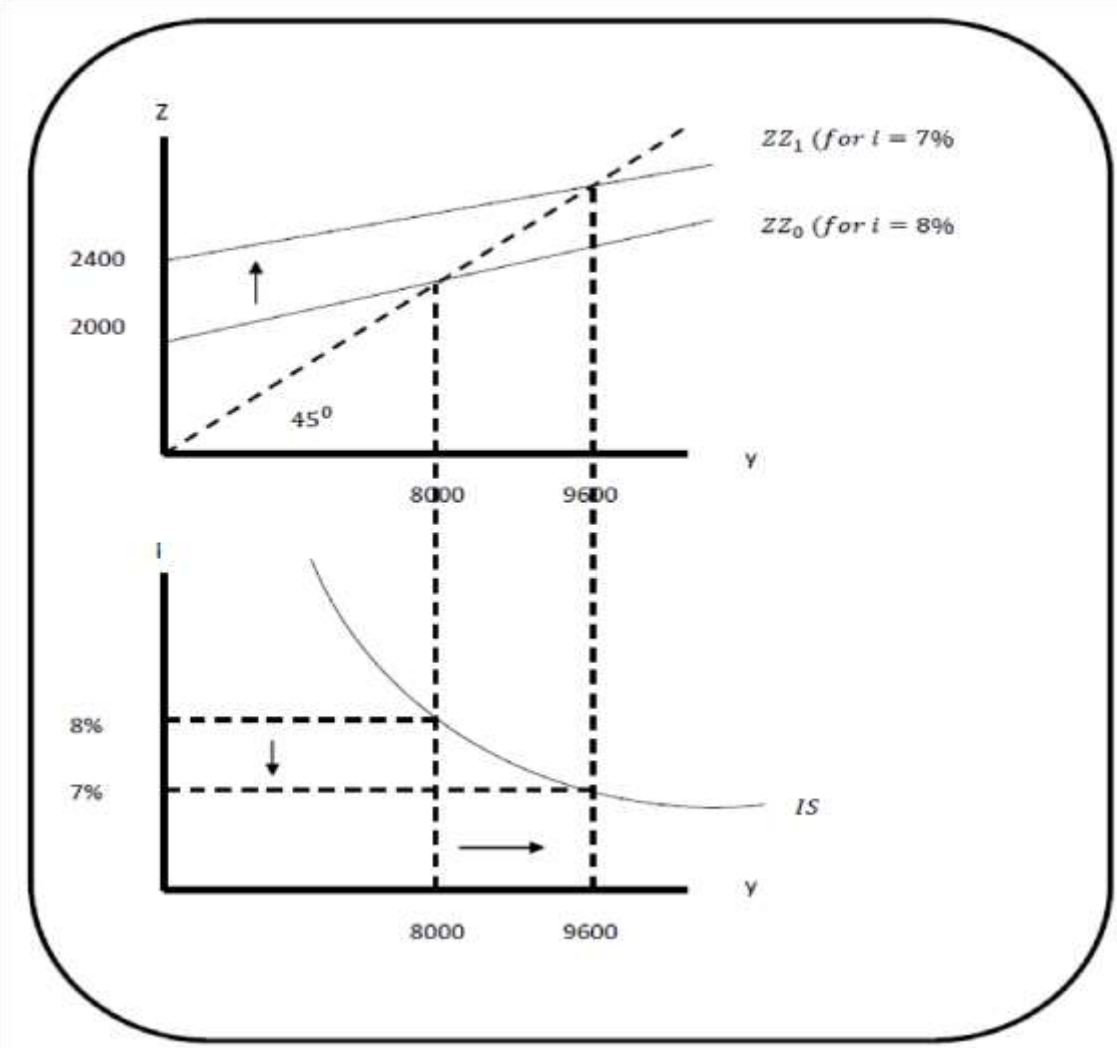
a Use the following information to graphically derive the IS curve
A decrease in the interest rate from 8% to 7% increases investment by 400
The level of autonomous spending before the decrease in the interest rate is 2 000
The multiplier is 4
Clearly indicate any change in direction and values (5)

Question 2

$\propto = 4$ $y = \propto \bar{z}$

y= 4 x 2000 = 8 000

y = 4 x 2400 = 9600


Z
ZZ_1 (for i = 7%
ZZ_0 (for i = 8%
2400
2000
45^0
Y
8000
9600
I
8%
7%
IS
Y
8000
9600

Nov 2013

QUESTION 1/VRAAG 1 (15 marks/15 punte)

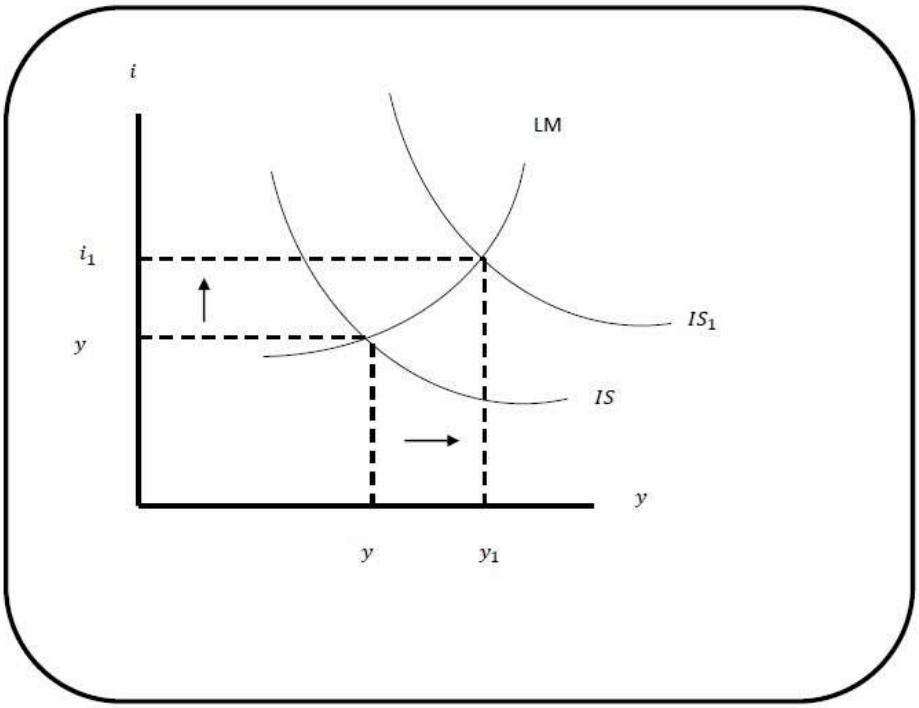
a Explain and illustrate by using two different diagrams the impact of an expansionary fiscal policy in

a Verduidelik en illustreer deur twee verskillende diagramme te gebruik die impak van 'n ekspansionistiese fiskale beleid op

i The goods market model (3)
i Die goederemarkmodel (3)

ii The IS-LM model (4)
ii Die IS-LM-model (4)

Question (a) (ii) Expansionary Fiscal Policy



a During the recession in 2009 the level of output and income declined in the South African economy

a Gedurende die resessie in 2009 het die produksie- en inkomepeil in die Suid-Afrikaanse ekonomie afgeneem

i Use the IS-LM model to explain how stabilisation policies were used during the recession to increase the level of output and income (6)

Question 2 (a) Refer to May/June 2013, Section B, Q 1c

OPENNESS IN GOODS, FINANCIAL AND IS-LM MODEL

PRACTICE OF THE CONCEPT FROM PAST PAPERS

May 2012

QUESTION 2/VRAAG 2 (15 marks/15 punte)

Use the **IS-LM model for an open economy** to explain the possible impact of a contractionary monetary policy and an expansionary fiscal policy on the

a Level of output and income
b Interest rate
c Financial account of the balance of payments
d Exchange rate
e Trade balance

(Indicate the direction of change and give a reason for the change)

Section B

QUESTION 2 (a)

Variable	Expansionary Fiscal Policy	Contractionery Monetary Policy
Interest rate	Increases	decrease
Exchange rate	Appreciates	depreciates
Exports & imports	Experts decrease Imports increase	Exports increase Imports increase
Trade balance	Worsens	improves

Nov 2012

NOV 2012

SECTION B

Question 2

Refer to Nov. 2013 Question 3b and May 2013 Question 3

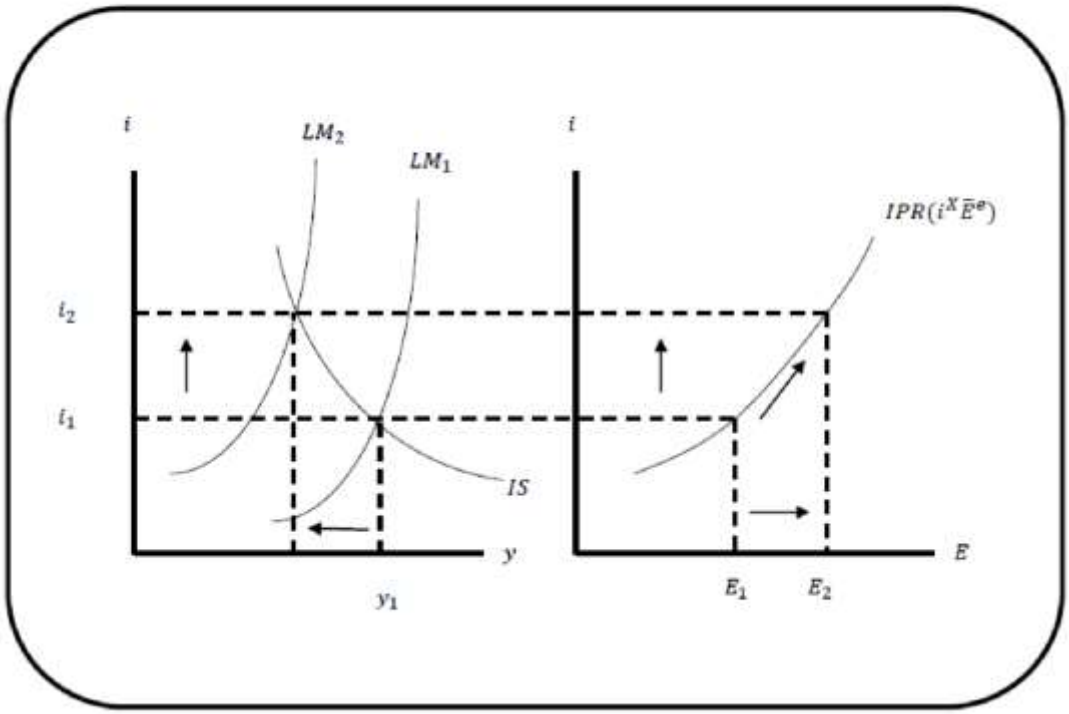
May 2013

QUESTION 3/VRAAG 3 (11 marks/11 punte)

Use an IS-LM model for an **open economy** to illustrate and explain why a contractionary monetary policy leads to a decline in the level of output and an increase in the trade deficit

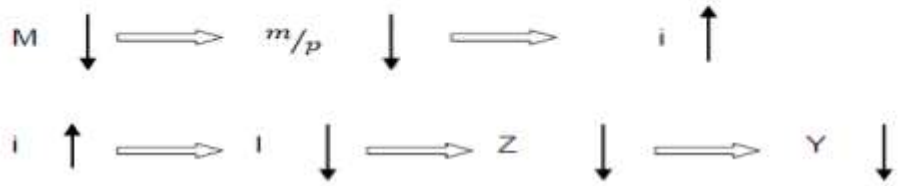
SECTION A

Question 3



Impact

(i) Goods Market and Financial Market



Trade Balance

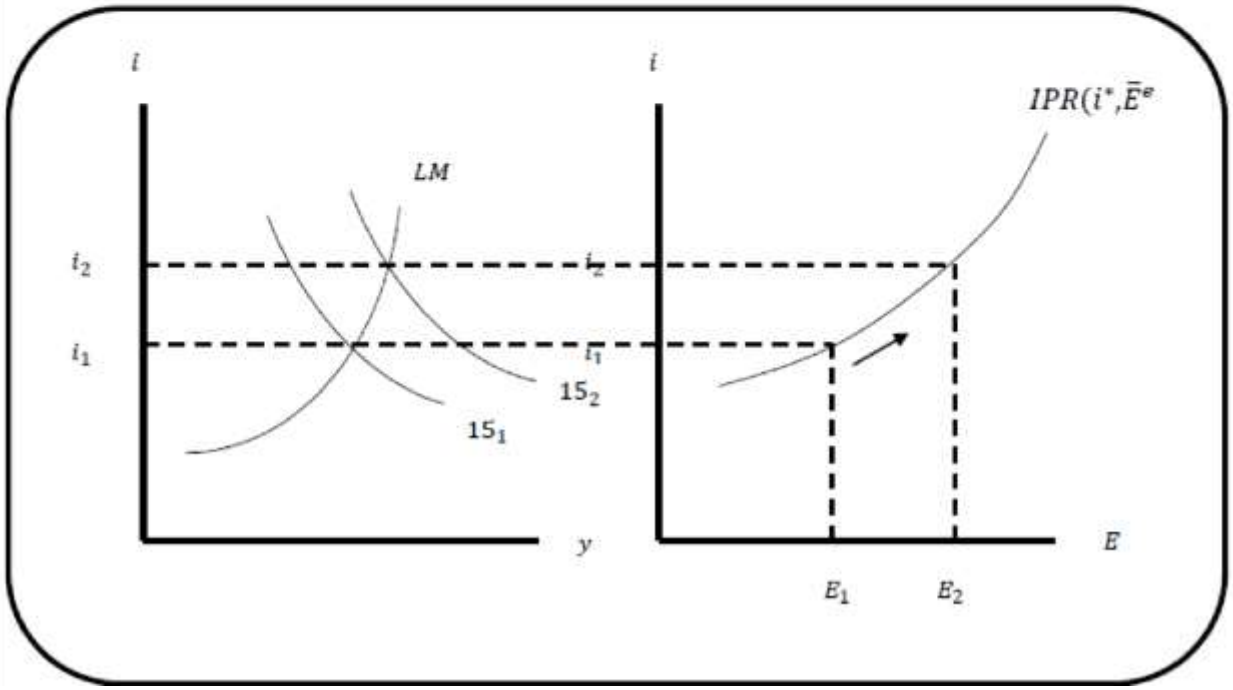
Rise in interest rate cause an increase exchange rate which reduces experts. The trade balance worsens.

Nov 2013

b Use the **IS-LM model for an open economy** to explain the possible impact of a decrease in government spending on the i) interest rate, ii) the level of output and income, iii) the financial account of the balance of payments, iv) the exchange rate and v) the trade balance (9)

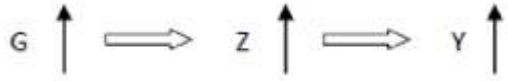
SECTION B

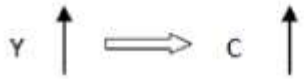
Question 2 (b)



(i) Interest rate will increase, its impact on financial market is

(ii) Increase the level of output and income





(iii) The financial account balance improves ,if domestic interest rate increases there will be net cash in flow in the economy.

(iv) Normal exchange rate increases

(v) The trade balance deteriorate / decrease.

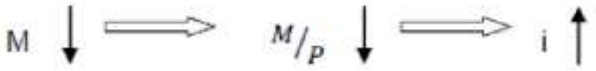
b Use the **IS-LM model for an open economy** to explain the impact of contractionary monetary policy on the financial market, the goods market, the financial account of the balance of payments, the exchange rate and the trade balance (9)

Question 3 (b)

The impact of contractionery monetary policy:

(i) Financial Market

Decrease in nominal money supply decreases real money supply and increase interest rate.



(ii) Goods Market

Increase in interest rate causes a decline in investment the demand decreases and also the level of output and income.

Due tomultiplier effect ,it leads to further decline in investment and output

(iii) Financial Account

Rise in interest rate cause an increase in capital inflows, and the financial account balance improves.

(iv) The nominal exchange rate increases and the domest currency appreciate

(v) Trade balance

Net exports decreases and worsen the trade balance

(Page 136 study guide)

LABOUR MARKET

(***How to read this chapter? Note that there are some attachments inserted along this topic, they are not in the order of discussion but they help in terms of graphs and equations. You can easily identify them by different fond and colors used***)

The purpose of this labor market model is to give us an idea of what determines the supply of goods and services. The main considerations in this regard are the behavior of labor and firms. Firms are responsible for the production of goods and services and are a major factor in determining the price level. Their behavior will be explained in the price-setting relation.

The wage paid to labour to produce goods and services are an important part of the production costs. The behavior of labour is summed up in the wage-setting relation; and it is this price and wage setting behaviour that determines the supply of goods and services in the economy.

Let's first trace the behaviour of labour by looking at how it influences wage setting, and therefore the cost of production in the economy

Bargaining Power

This section we take a closer look at some of the important factors that influence the behaviour of workers when negotiating for wages. The labour-market model reflects that wage bargaining is done in terms of a nominal wage, but the object is to obtain a certain real wage.

The nominal or money wage is the amount of money actually received by a worker per hour, day, week, month or year while the real wage is the quantity of goods and services that can be purchased with the nominal or money wage.

For a given nominal wage an increase in the general price level causes a decline in the real wage, which means that less can be bought. By contrast a lower general price level causes an increase in the real wage so that with a given nominal wage more goods can be bought.

The factors that impact on the nominal bargained wage are:

If workers expect the price level to increase in the future they will bargain for a higher nominal wage in order to protect their purchasing power. The expected price level and the bargained nominal wage is therefore positively correlated in that an increase in the expected price level increases the bargained nominal wage while a decrease in the expected price level decreases the bargained nominal wage.

The unemployment rate influences workers' bargaining power in that rising unemployment erodes their bargaining power since they are more likely to lose their jobs and the probability of finding another job is lower when unemployment is high. At the same time it increases the bargaining position of firms in the economy since it is easier for them to find replacements.

The unemployment rate and the bargained nominal wage are therefore negatively correlated. The higher the unemployment rate the less is workers' bargaining power and the lower the nominal bargained wage. On the other hand, the lower the unemployment rate the greater the workers' bargaining power and the higher the bargained nominal wage.

Workers' bargaining position is affected by institutional factors such a labour laws and regulations, minimum wages and unemployment benefits. More specifically, the more difficult it is to fire workers the better their bargaining position will be. Similarly, workers' bargaining position improve with better unemployment benefits which lower the cost of being unemployed.

Our nominal wage equation can now be written as follows: on following attached pages

The nominal wage W equals the expected price level Pe and is a function of the unemployment rate u and a catchall variable z that represents the institutional factors. Between the expected price level and the nominal wage a positive relationship exists, while a negative relationship exists between the rate of unemployment and the nominal wage.

We can now derive a relationship between the real wage and the unemployment rate.

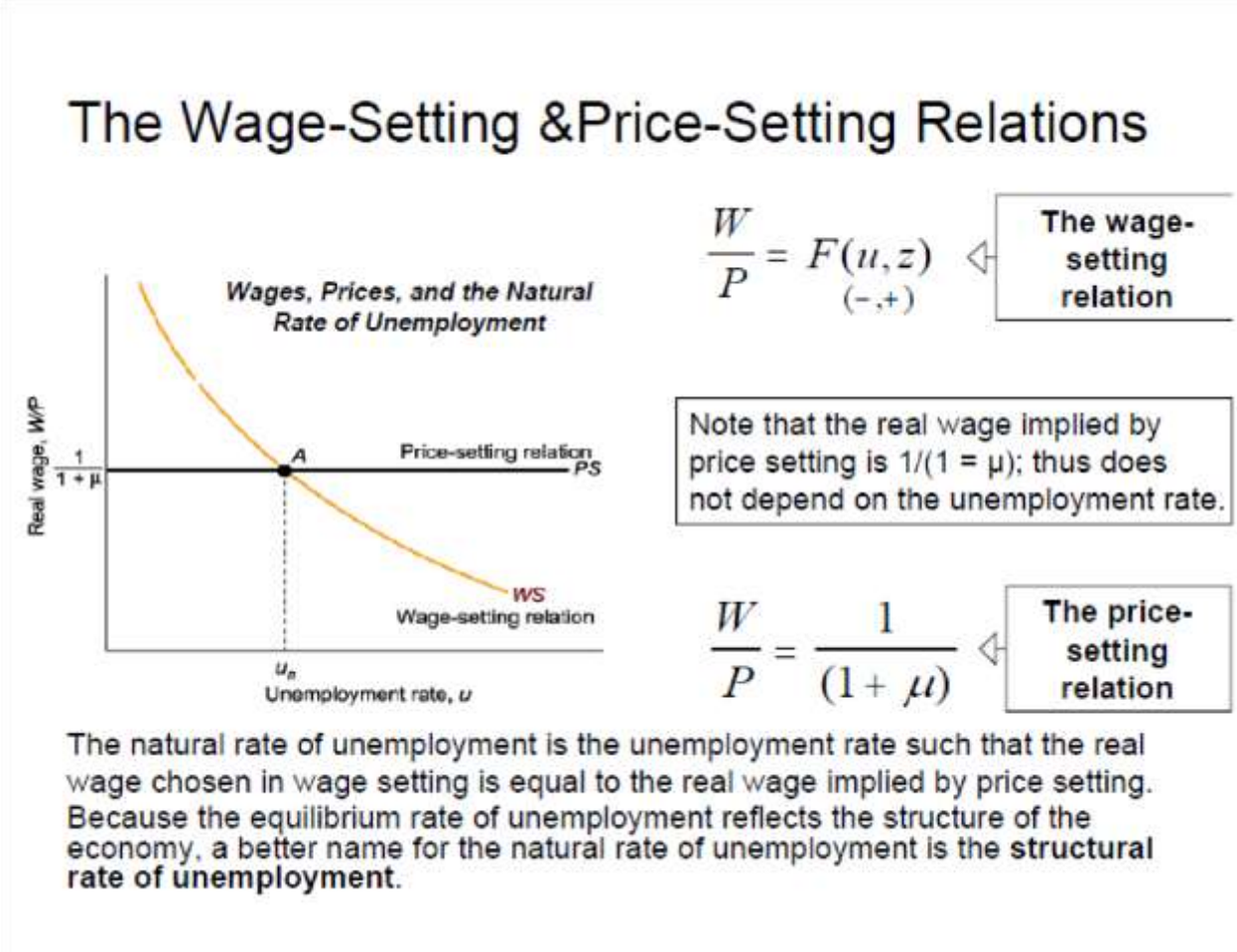
Real Wage & Unemployment rate

To derive a relationship between the real wage and the rate of unemployment we assume that all other things are unchanged and that the expected price level and the actual price level is the same.

Dividing both sides by the price level P, our real-wage equation shows that a negative relationship exists between unemployment and the real wage for the simple reason that workers' bargaining power declines with rising unemployment. The higher the unemployment rate the lower the real wage they will be able to bargain for.

This relationship can now be presented with the aid of a diagram to follow on attachments.

Price Setting and Wage Setting



The unemployment rate is measured on the horizontal axis and the real wage on the vertical axis. The real wage setting relationship WS shows a downward slope indicating that the higher the unemployment rate the lower the real wage that workers can bargain for because it weakens workers' bargaining position.

This real wage setting relationship does not tell us what the actual real wage is but what the targeted or desired real wage is that they will try to achieve at different unemployment rates.

What the actual real wage will be depends on the price-setting behaviour of firms in the economy, which is the topic of the next section.

Price Setting

This model is based on the assumption that that prices are set on a cost-plusprofit basis. The price level is therefore a function of the cost of production and a markup, which is determined by the market power that firms have. Assuming that firms have some market power and that wages are the only production cost, the equation for price determination can be written as:

Price is equal to a markup over labour cost.

This relationship tells us that if the wage cost increases and the markup is unchanged the price level will increase. The price level will rise at the same rate as wages. In other words a 10% increase in wage cost will lead to a 10% increase in the price level.

The actual real wage paid to labour is determined by the way that prices are set in the economy and is captured by the price-setting relation. While workers try to bargain for a higher real wage the real wage they actually receive will depend on the price level, which is beyond their control – it is in the hands of the firms.

Let's see what happens if workers can bargain for a 12% increase in their nominal wages, which would mean that, if granted, firms production cost would rise 12%. Given that their markup stays the same, firms will raise their prices 12%. The real wage, which is the nominal wage divided by the price level, stays the same since the nominal wage and the price level both rose 12%. Workers cannot increase their real wage by bargaining for a nominal wage increase since this particular model only

allows them to negotiate a higher real wage if they can force firms to reduce their markup. A lower markup means a lower price level and for a given nominal wage it implies a higher real wage. In economics this is referred to as the battle for the markups.

In our diagram the price-determined real wage is shown as a horizontal line and indicates that the level of unemployment has no impact on the markup of firms.

With the real wage-setting relationship and the price-setting relationship behind us we should now consider equilibrium in the labour market.

Equilibrium Real Wages and Unemployment

Eliminating W/P from the wage-setting and the price-setting relations, we can obtain the equilibrium unemployment rate, or natural rate of unemployment, u_n:

$$F(u_n, z) = \frac{1}{1+\mu}$$

The equilibrium unemployment rate (u_n) is called the **natural rate of unemployment**.

The positions of the wage-setting and price-setting curves, and thus the equilibrium unemployment rate, depend on both z and u.

- At a given unemployment rate, higher unemployment benefits lead to a higher real wage. A higher unemployment rate is needed to bring the real wage back to what firms are willing to pay.
- By letting firms increase their prices given the wage, less stringent enforcement of antitrust legislation leads to a decrease in the real wage.

At this point the real wage that workers bargain for is the same as the real wage implied by the price setting of firms. The level of unemployment at which this occurs is known as the natural level of unemployment.

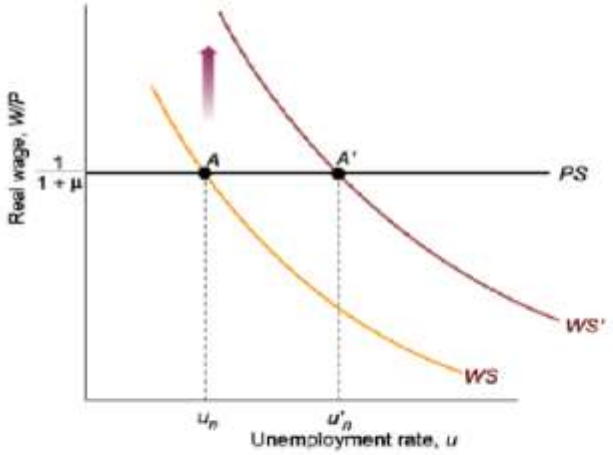
At any other unemployment rate the targeted real wage, that is the real wage which workers would like to reach, differs from the feasible real wage, that is the real wage implied by the price-setting behaviour of firms.

Let's look at such a point. At an unemployment level that is lower than the natural level of unemployment, such as point b, the targeted real wage exceeds the real wage implied by price setting. At this unemployment rate workers can negotiate for a higher nominal wage W2 (j) which implies a higher real wage given a price level

of P1. They are able to do this since the lower unemployment rate increases their bargaining position.

Equilibrium Real Wages and Unemployment

An increase in unemployment benefits leads to an increase in the natural rate of unemployment.



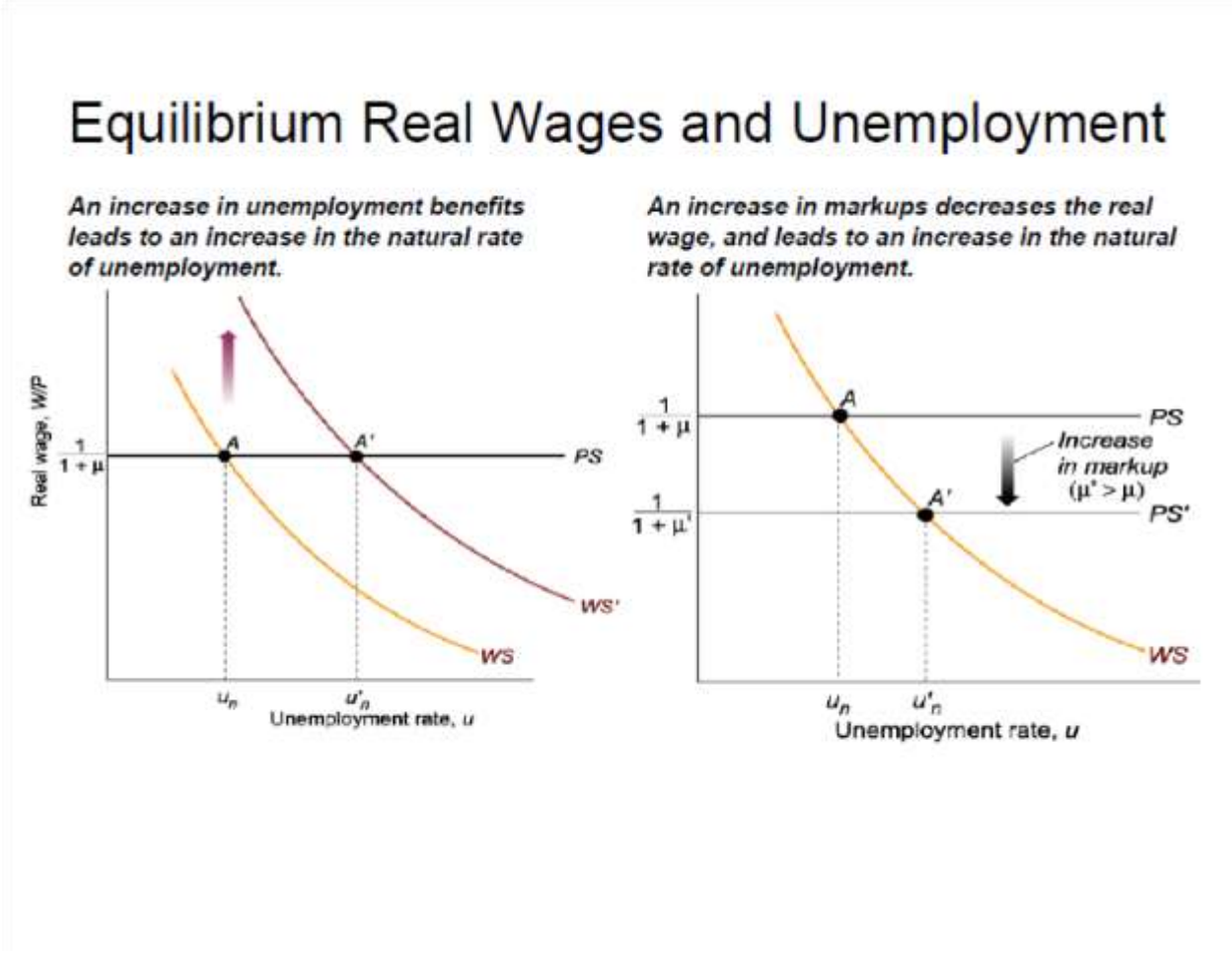
The positions of the wage-setting and price-setting curves, and thus the equilibrium unemployment rate, depend on both z and u.

- At a given unemployment rate, higher unemployment benefits lead to a higher real wage. A higher unemployment rate is needed to bring the real wage back to what firms are willing to pay.
- By letting firms increase their prices given the wage, less stringent enforcement of antitrust legislation leads to a decrease in the real wage.

Will they be able to achieve this higher real wage? The answer is no. Firms will eventually respond to this higher nominal wage by increasing the price level and thus leaving the real wage unchanged. What has happened in the economy is that lower unemployment is accompanied by inflation.

At the lower than natural unemployment rate shown as point c the bargaining position of workers is eroded and their bargained nominal wage declines so that the targeted real wage is lower than the real wage implied by the price setting. Firms respond to the lower nominal wage by reducing prices so that higher

unemployment is accompanied by a lower price level, leaving the real wage unchanged.



The following important conclusions can be drawn from the above analysis:

Workers cannot increase their real wages by bargaining for higher nominal wages since prices rise with wages:

Nominal wages increase with decreasing unemployment, thus leading to higher prices. It follows that higher production reduces unemployment, which leads to higher prices. This relation plays an important role in the AS-AD model.
Unemployment serves as a disciplining device to keep the wage demands of workers in check. At point b, for example, where the targeted real wage of workers exceeds

the feasible real wage, prices will be higher unless unemployment recedes to its natural level. If an increased price level is unacceptable to policy makers they can make use of fiscal and monetary policies to reduce the level of output and thereby increase unemployment which erodes the bargaining position of workers.

Equilibrium Real Wages and Unemployment

Associated with the natural rate of unemployment is a **natural level of employment** N_n

Since the unemployment rate equals $$u = \frac{U}{L} = \frac{L-N}{L} = 1 - \frac{N}{L}$$

thus employment in terms of the labor force is $$N = L(1-u)$$

The natural level of employment, N_n, is therefore given by: $$N_n = L(1-u_n)$$

Associated with the natural level of employment is a **natural level of output,** (and since Y=N, then,) $$Y_n = N_n = L(1-u_n)$$

The natural level of output satisfies the following: $$F\left(1 - \frac{Y_n}{L}, z\right) = \frac{1}{1+\mu}$$

In words, the natural level of output is such that, at the associated rate of unemployment, $u_n = 1 - \frac{Y_n}{L}$, the real wage chosen in wage setting is equal to the real wage implied by price setting.

Natural level of unemployment rises if workers' bargaining position is improved by institutional factors such as labour laws. The diagram shows that an improved bargaining position shifts the WS curve upwards so that the natural level of unemployment now occurs at a higher level.

A decrease in the markup of firms implies that the real wage implied by price setting is higher and that the natural rate of unemployment is lower. On the diagram this is represented by an upward shift of the PS curve indicating a higher feasible real wage and a lower natural level of unemployment. The opposite occurs if the markup increases.

PRACTICE OF THE CONCEPT FROM PAST PAPERS

May 2012

Nov 2012

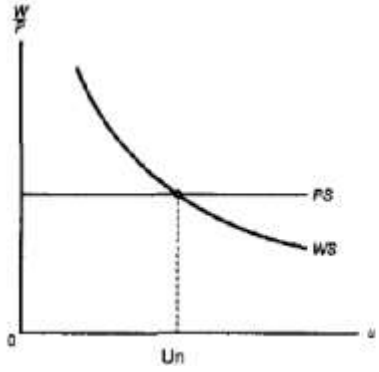
May 2013

QUESTION 4/VRAAG 4 (8 marks/8 punte)

Use the following labour market model to show graphically what happens when

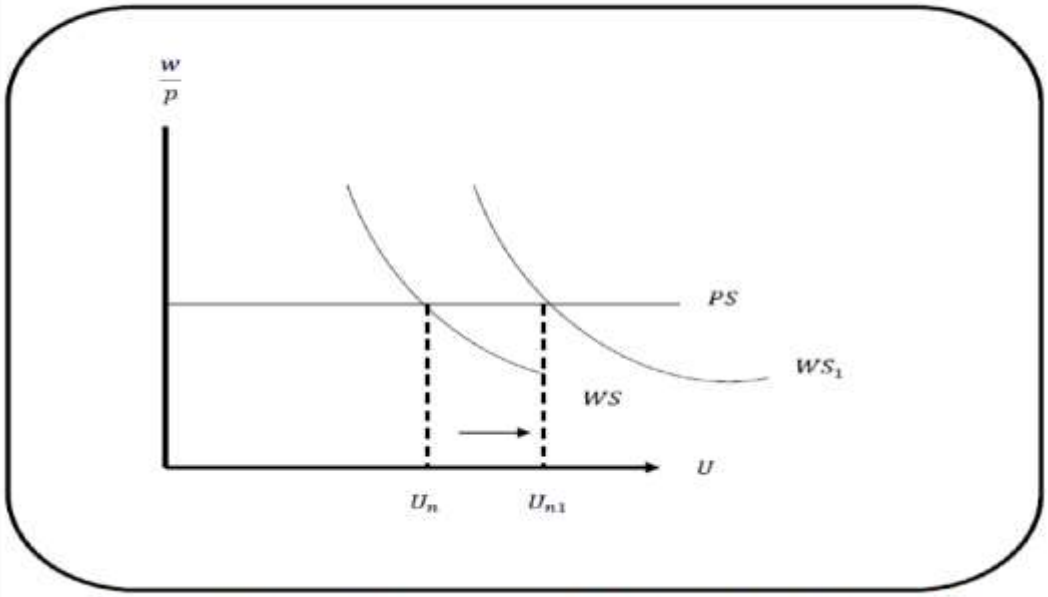
Gebruik die onderstaande arbeidsmarkmodel om grafies aan te toon wat gebeur wanneer

a The bargaining position of workers increase (2)
a Die bedingingsposisie van werkers versterk (2)



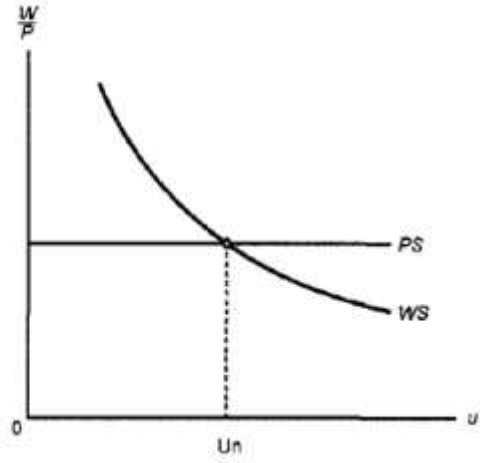
Section A

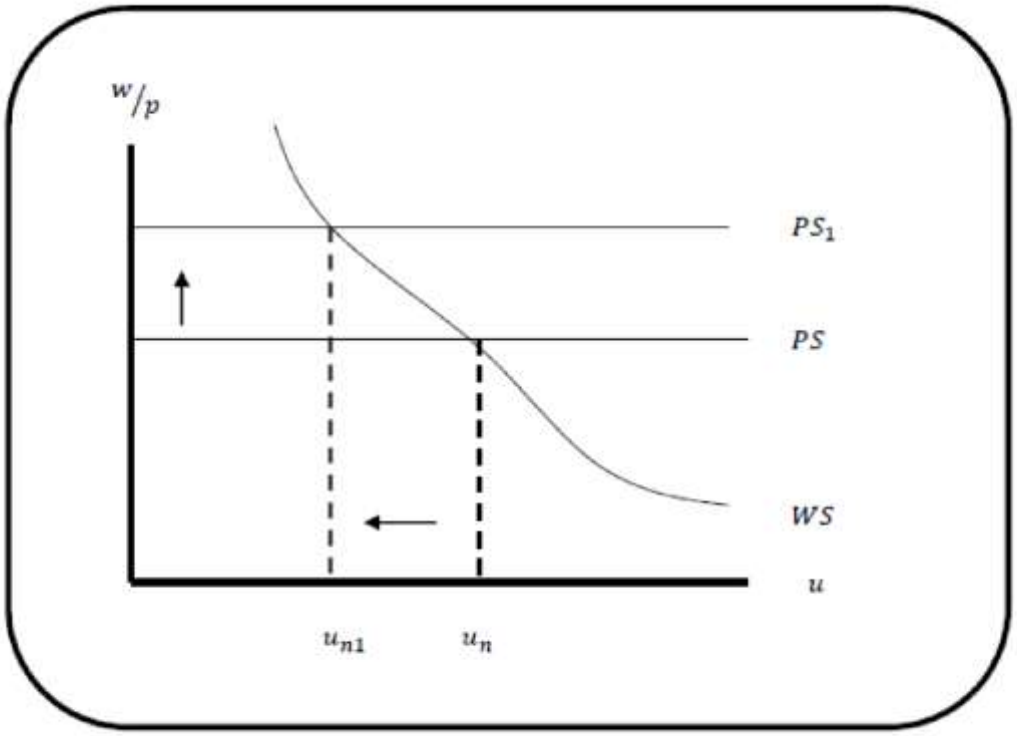
Question 4



Increase in bargaining power shift WS to the right and natural rate of employment increases (page 154 study guide)

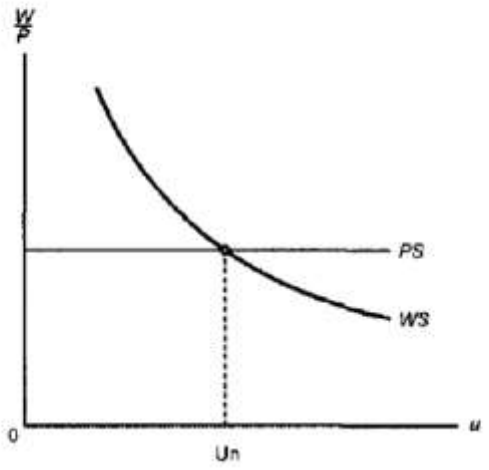
b A decrease in the markup by firms (2)
b Die prystoeslag van firmas daal (2)



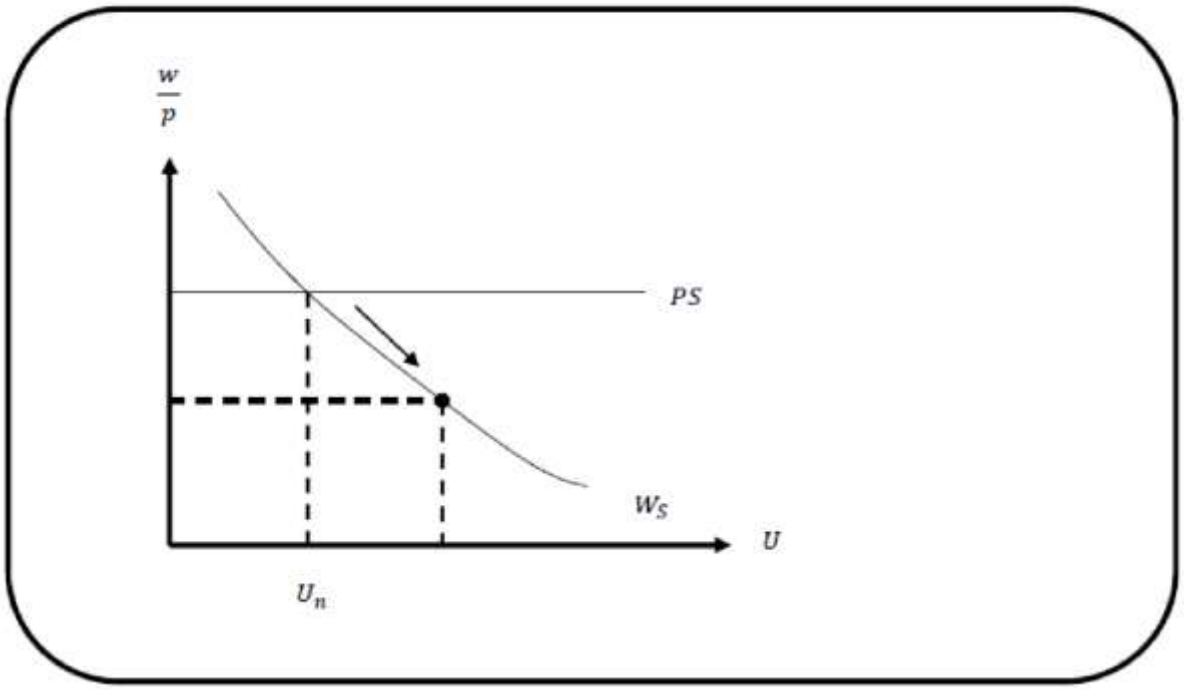


Decrease in mark up shifts PS upwards and reduce the natural rate of employment.

c The unemployment rate increases (2)
c Die werkloosheidskoers toeneem (2)



(c)



Nov 2013

QUESTION 7/VRAAG 7 (10 marks/10 punte)

7 1 Identify the factors that impact on the targeted nominal wage in the wage setting relationship Clearly indicate the relationship between the factors and the targeted nominal wage (4)

NOV 2013

SECTION A

7.1 The factors that impact nominal wage setting relationship are:

- ✓ Price level (P)
- ✓ Unemployment rate]
- ✓ Institutional factors such as unemployment benefits

$$W = P^e F(U,Z)$$

\+ - +

7 3 Identify three factors that will **increase** the natural rate of unemployment (3)

7.3 Factors that increase natural rate of unemployment:

- ✓ Increase in workers' bargaining position (we shift right)
- ✓ Increase in mark up (cause PS to shift down)

AD-AS MODEL

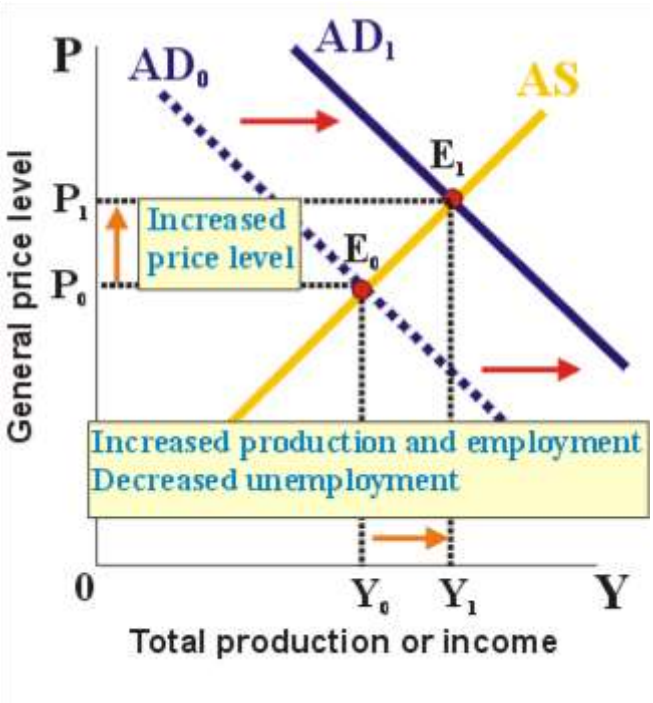
expansionary (or stimulatory) policy

An expansionary policy is used to stimulate economic activity by increasing aggregate demand.

An **expansionary fiscal policy** means that government spending has to be increased and/or taxes have to be decreased.

An **expansionary monetary policy** implies an increase in the money supply and a decrease in the interest rate.

In the AD-AS model, an expansionary fiscal or monetary policy shifts the AD curve to the right.



Chapter 7 – AS-AD Model
Aggregate Supply

The **aggregate supply relation** captures the effects of output on the price level. It is derived from the behavior of wages and prices.

Recall the equations for wage and price determination :

$$W = P^e F(u, z)$$
$$P = (1 + \mu)W$$

Step 1: Eliminate the nominal wage from:

$$P = P^e (1 + \mu) F(u, z)$$

In words, the price level depends on the expected price level and the unemployment rate. We assume that μ and z are constant.

Step 2: Express the unemployment rate in terms of output:

$$u = \frac{U}{L} = \frac{L - N}{L} = 1 - \frac{N}{L} = 1 - \frac{Y}{L}$$

Therefore, for a given labor force, the higher is output, the lower is the unemployment rate.

Aggregate Supply

$$P = P^e(1+\mu)F(u,z)$$

Step 3: Replace the unemployment rate in the equation obtained in step one:

$$P = P^e(1+\mu)F\left(1-\frac{Y}{L},z\right)$$

In words, the price level depends on the expected price level, P^e, and the level of output, Y (and also μ, z, and L, but we take those as constant here).

The *AS* relation has two important properties:

1. **An increase in output leads to an increase in the price level. This is the result of four steps:**
   1. $Y\uparrow \Rightarrow N\uparrow$
   2. $N\uparrow \Rightarrow u\downarrow$
   3. $u\downarrow \Rightarrow W\uparrow$
   4. $W\uparrow \Rightarrow P\uparrow$

Aggregate Supply

$$P = P^e(1+\mu)F\left(1-\frac{Y}{L},z\right)$$

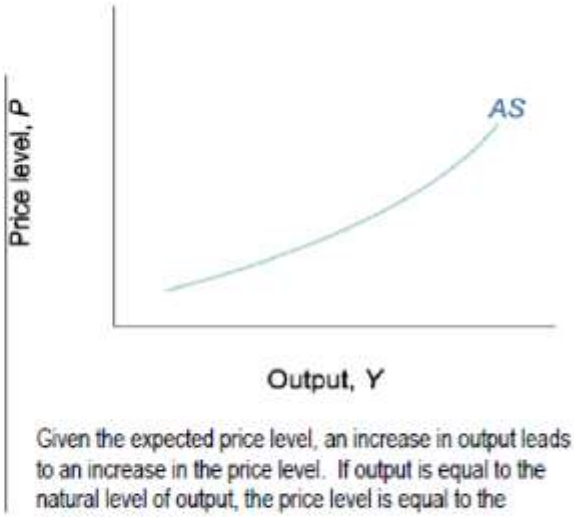
The *AS* relation has two important properties:

1. **An increase in output leads to an increase in the price level. This is the result of four steps:**

   $Y\uparrow \Rightarrow N\uparrow \Rightarrow u\downarrow \Rightarrow W\uparrow \Rightarrow P\uparrow$

2. **An increase in the expected price level leads, one for one, to an increase in the actual price level. This effect works through wages:**

   1. $P^e\uparrow \Rightarrow W\uparrow$
   2. $W\uparrow \Rightarrow P\uparrow$



Given the expected price level, an increase in output leads to an increase in the price level. If output is equal to the natural level of output, the price level is equal to the expected price level.

Aggregate Supply

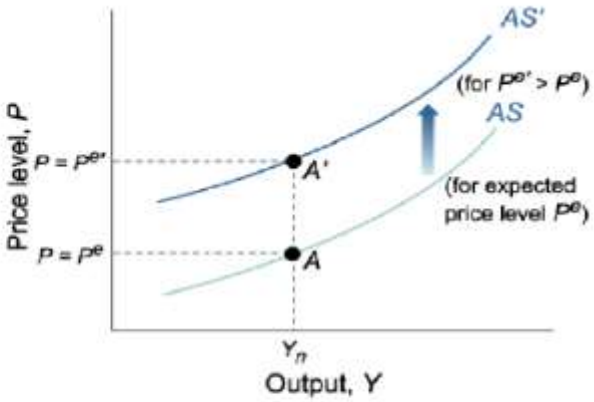
The *AS* curve has three properties that will prove to be useful in what follows:

① **The *AS* curve is upward sloping. As explained earlier, an increase in output leads to an increase in the price level.**

② **The *AS* curve goes through point *A*, where $Y = Y_n$ and $P = P^e$. This property has two implications:**

- When $Y > Y_n$, $P > P^e$.
- When $Y < Y_n$, $P < P^e$.

③ **An increase in P^e shifts the *AS* curve up, and a decrease in P^e shifts the AS curve down.**



Aggregate Demand

The **aggregate demand relation** captures the effect of the price level on output.

It is derived from the equilibrium conditions in the goods and financial markets:

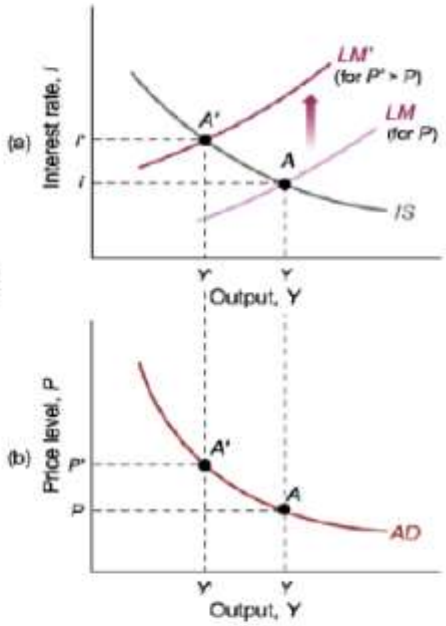
$$IS\ relation:\ Y = C(Y - T) + I(Y, i) + G$$

$$LM\ relation:\ \frac{M}{P} = YL(i)$$

$$Y = Y\left(\frac{M}{P}, G, T\right)$$
$$(+, +, -)$$

1. An increase in the price level leads to a decrease in output.

$$\uparrow P \rightarrow \downarrow \frac{M}{P} \rightarrow i\uparrow \rightarrow \downarrow demand \rightarrow \downarrow Y$$



Aggregate Demand

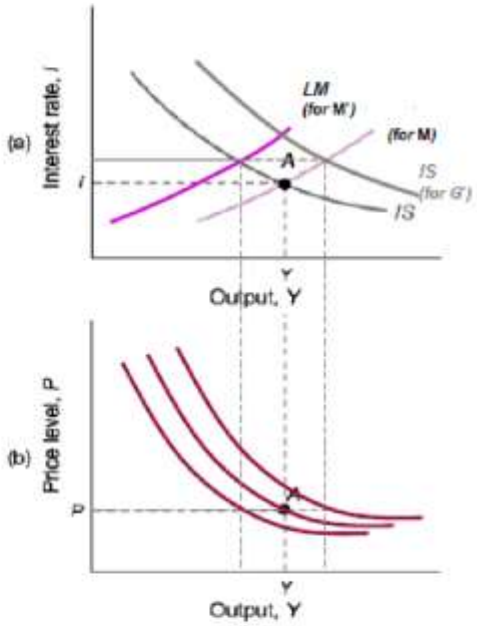
$$Y = Y\left(\frac{M}{P}, G, T\right)$$
$$(+, +, -)$$

1. An increase in the price level leads to a decrease in output.

$$\uparrow P \rightarrow \downarrow \frac{M}{P} \rightarrow i\uparrow \rightarrow \downarrow demand \rightarrow \downarrow Y$$

2. A decrease in nominal Ms decreases output at a given price level, shifting the aggregate demand curve to the left.

3. An increase in G increases output at a given price level, shifting the aggregate demand curve to the right.



Equilibrium in the Short Run

- The aggregate supply curve *AS* is drawn for a given value of P^e. The higher the level of output, the higher the price level.

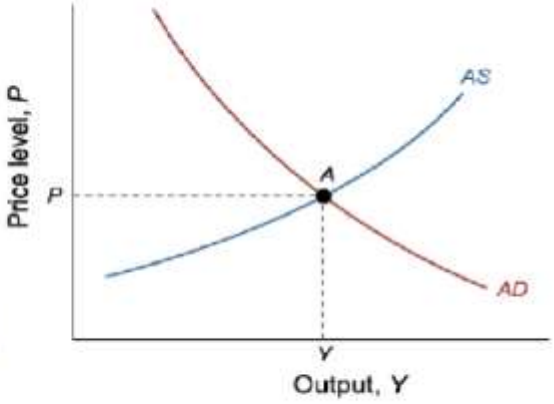
$$AS\ Relation \quad P = P^e(1+\mu)F\left(1-\frac{Y}{L}, z\right)$$

- The aggregate demand curve *AD* is drawn for given values of *Ms*, *G*, and *T*. The higher the price level is, the lower the level of output.

$$AD\ Relation \quad Y = Y\left(\frac{M}{P}, G, T\right)$$

The Short Run Equilibrium is given by the intersection of the aggregate supply curve and the aggregate demand curve. At point *A*, the labor market, the goods market, and financial markets are all in equilibrium.

The Short Run Equilibrium



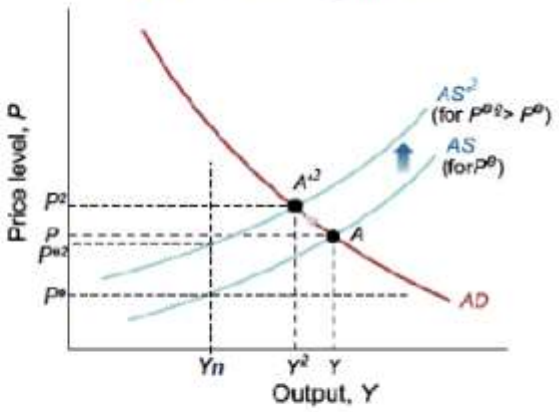
From the Short Run to the Medium Run

Equilibrium output depends on the value of P^e. The value of P^e determines the position of the aggregate supply curve, and the position of the *AS* curve affects the equilibrium.

At point *A*, $Y > Y_n \Rightarrow P > P^e$

- Wage setters will revise upward their expectations of the future price level to p^{e2}. This will cause the *AS* curve to shift upward.
- Expectation of a higher price level also leads to a higher nominal wage, which in turn leads to a higher price level p^2.

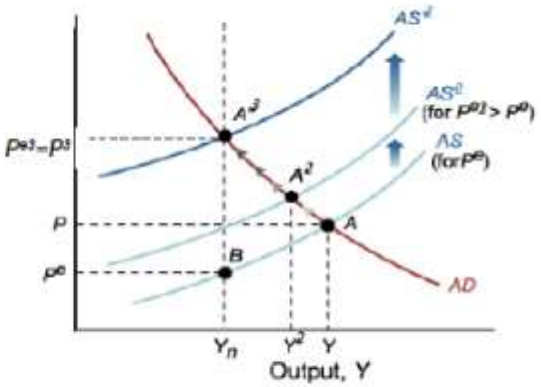
The Short Run Equilibrium =>



From the Short Run to the Medium Run

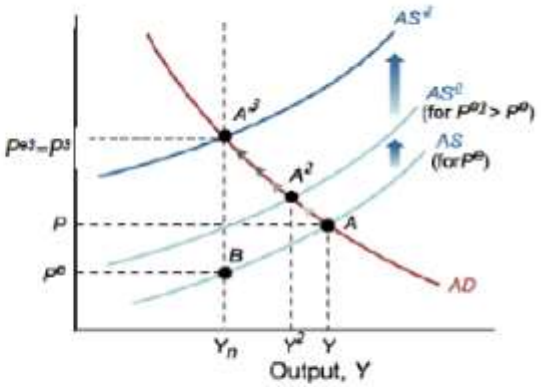
The adjustment ends once $Y = Y_n$ *and* $P = P^e$ and wage setters no longer have a reason to change their expectations.
In the medium run, output returns to the natural level of output.

If output is above the natural level of output, the *AS* curve shifts up over time, until output has decreased back to the natural level of output.



From the Short Run to the Medium Run

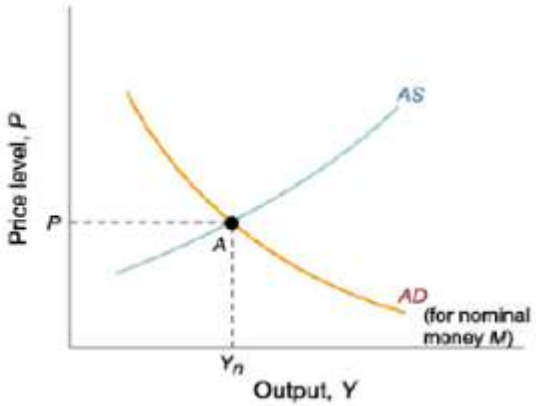
- In the *short run*, output can be above or below the natural level of output. Changes in any of the variables that enter either the aggregate supply relation or the aggregate demand relation lead to changes in output and to changes in the price level.
- In the *medium run*, output eventually returns to the natural level of output. The adjustment works through changes in the price level.



The Dynamic Effects of a Monetary Expansion

$$Y = Y\left(\frac{M}{P}, G, T\right)$$

In the aggregate demand equation, we can see that an increase in nominal money, *M*, leads to an increase in the real money stock, *M/P*, leading to an increase in output. The aggregate demand curve shifts to the right.



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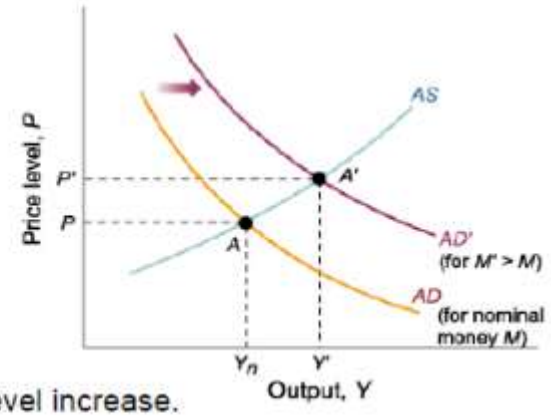

In the short run, output and the price level increase.

The Dynamic Effects of a Monetary Expansion

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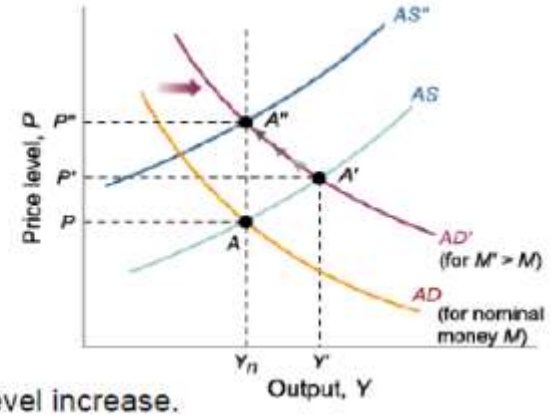


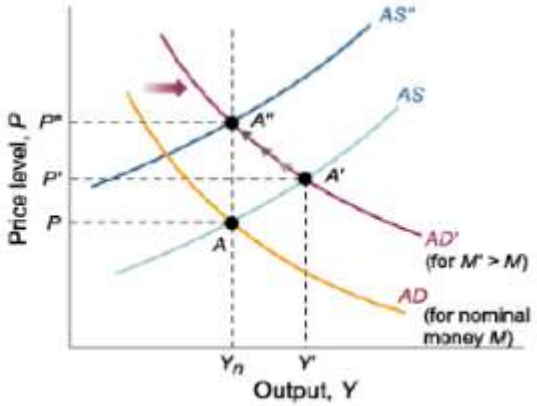
In the short run, output and the price level increase.

The difference between *Y* and Y_n sets in motion the adjustment of price expectations.

In the medium run, the *AS* curve shifts to *AS''* and the economy returns to equilibrium at Y_n.

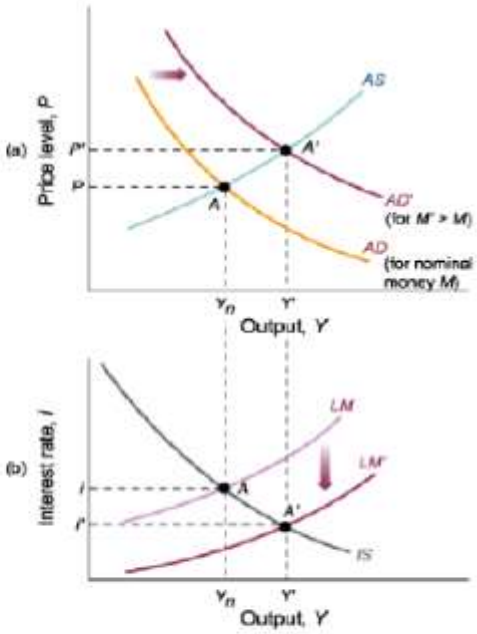
The Dynamic Effects of a Monetary Expansion

A monetary expansion leads to an increase in output in the short run, but has no effect on output in the medium run.
The increase in prices is proportional to the increase in the nominal money stock.



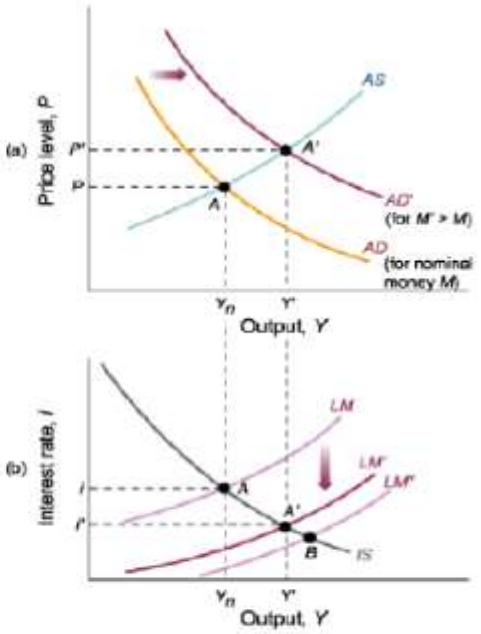
Going Behinds the Scenes

- The impact of a monetary expansion on the interest rate can be illustrated by the *IS-LM* model.
- The short-run effect of the monetary expansion is to shift the *LM* curve down. The interest rate is lower, output is higher.



Going Behinds the Scenes

- The impact of a monetary expansion on the interest rate can be illustrated by the *IS-LM* model.
- The short-run effect of the monetary expansion is to shift the *LM* curve down. The interest rate is lower, output is higher.
- If the price level did not increase, the shift in the *LM* curve would be larger—to *LM''*.

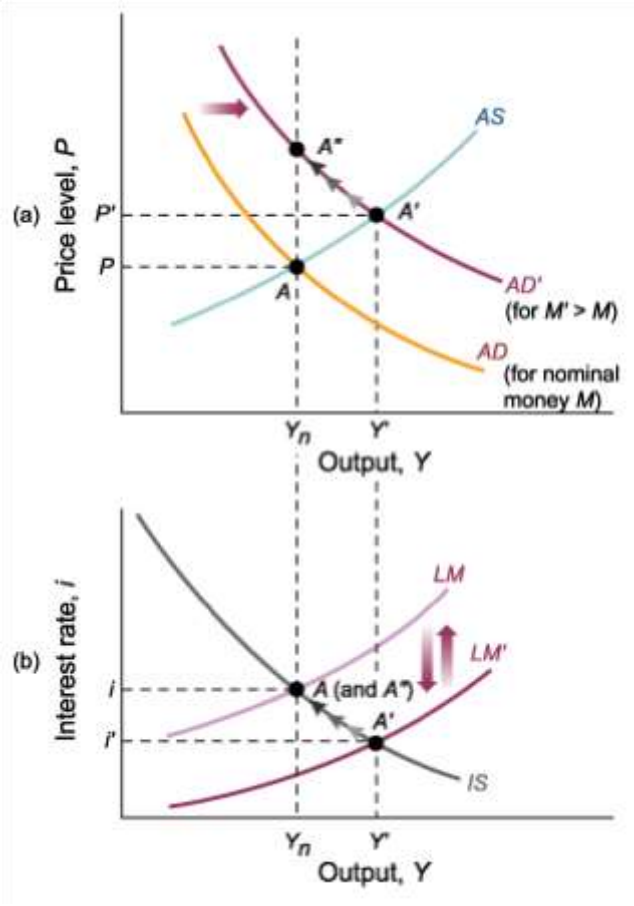


The Neutrality of Money

In the short run, a monetary expansion leads to an increase in output, a decrease in the interest rate, and an increase in the price level.

In the medium run, the increase in nominal money is reflected entirely in a proportional increase in the price level.

The neutrality of m**oney** refers to the fact that an increase in the nominal money stock has no effect on output or the interest rate in the medium run. The increase in the nominal money stock is completely absorbed by an increase in price level.



PRACTICE OF THE CONCEPT FROM PAST PAPERS

AD – AS MODEL

NOV 2013

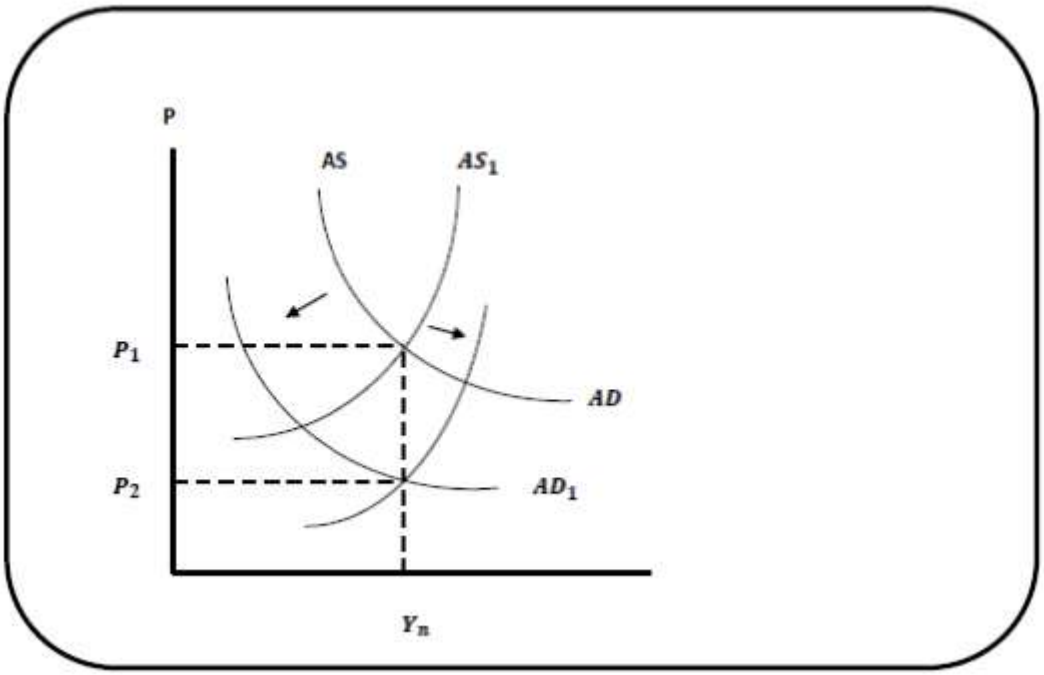
SECTION B

Question 1 (b)

Nominal variables	Real Variables
Nominal money supply (m^s price level (P) normal wage (W)	Real money supply $(^m/_p)$ interest rate (i) Investment spending (I) demand for goods (Z) level of output and income (Y) real wage $(^w/_p)$

(c) The impact of expansionary monetary policy only changes the nominal variables in the long – run. However, it leaves the real variables such as $^m/_p$ and $^w/_p$ unchanged. (pg 173 study guide).

Question 3 (a)



Impact of contractionery monetary policy in the long – run

(i) Events in labour market

The expected price level decrease, and the negotiated nominal wage decrease as :

$$P^e \downarrow \Longrightarrow W \downarrow \Longrightarrow P \downarrow$$

(ii) Financial and goods market

As the price level decreases, the real money supply increases in the financial market leading to a decrease in interest rate. The impact is summarised by chain of events:

$$P \downarrow \Longrightarrow {}^{M}/_{P} \uparrow \Longrightarrow i \downarrow \Longrightarrow Z \uparrow \Longrightarrow Y \uparrow$$

End result is that Investment level remains unchanged,as it starts to decrease in the short run and then increase in the longrun.

MAY 2013

Section B

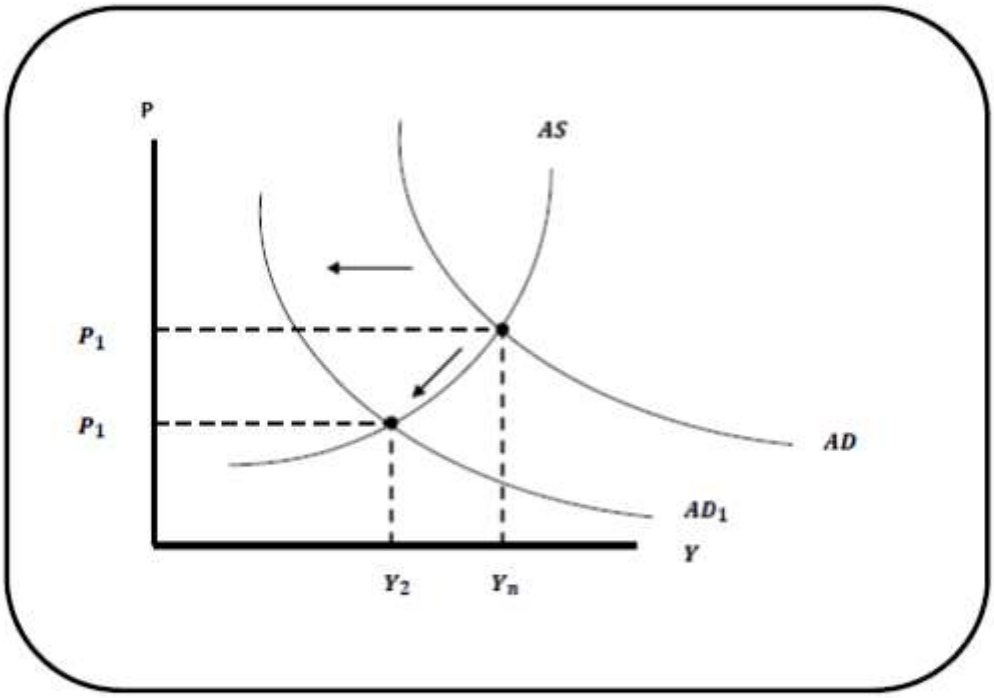
Question 1 (b)

In the medium –long run a decrease in price level triggers an increase in the real money supply and interest rate declines. A decrease in the interest rate increases investment spending, the demand for goods and the level of output and income.

NOV 2012

Section B

Question 3



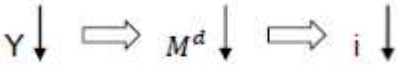
Good Market

G ↓ ⇨ Z ↓ ⇨ Y ↓

Decrease in G will reduce the demand for goods and services and income.

Financial Market

A decline in output reduce demand for money and interest rate.



Labour Market

As income declines, level of employment decrease and unemployment rate increases. The bargaining position of workers and nominal wage declines, causing decrease in the price level.