Tutorial letter 204/1/2016

Macroeconomics

ECS2602

Department of Economics
Semester 1

Answers to Assignment 04

Answers to Self-assessment Assignment 05

BAR CODE

Dear student

In this tutorial letter you will find the answers to Assignment 04 and self-assessment Assignment 05.

ANSWERS TO ASSIGNMENT 04
(Unique number: 884585)

The fourth assignment was based on learning units 5 to 7. If you experience any problems with these sections, work through the activities in TL102 again.

The correct answers are:

Question		Question		Question	
1	4	**13**	3	**25**	4
2	3	**14**	1	**26**	2
3	4	**15**	3	**27**	1
4	3	**16**	5	**28**	4
5	5	**17**	1	**29**	5
6	1	**18**	3	**30**	1
7	2	**19**	3	**31**	2
8	3	**20**	4	**32**	4
9	5	**21**	3	**33**	2
10	2	**22**	2	**34**	1
11	3	**23**	4	**35**	5
12	3	**24**	4		

1. The correct option is 4. Statements a, b and e are correct. See section 5.1 of the study guide (MO001). Statement c is incorrect. The nominal exchange rate is the price of domestic currency in terms of foreign currency. Statement d is incorrect. The real exchange rate is the **relative** price of domestic goods in terms of foreign goods.

2. The correct option is 3. All the statements refer to the section regarding depreciation or an appreciation of the nominal exchange rate. See section 5.1 in the study guide. Statements a and e are correct. These are examples of a decrease or depreciation in the nominal exchange rate because the rand is worth less in terms of dollars than before, in other words you must pay more rand for one dollar. Statements b, c and d are examples of an appreciation of the rand in terms of a dollar since the rand is worth more in terms of dollars than before.

3. The correct option is 4. Statements 1 and 3 are incorrect. If there is an increase (or appreciation) in the nominal exchange rate the rand is worth more in terms of dollars. In other words, the rand becomes **more** expensive to foreigners and foreign currency becomes **less** expensive to South Africans. If the nominal exchange rate appreciates, exports will decrease and imports will increase, *ceteris paribus*. Therefore statements 2 and 5 are incorrect since imports will increase because foreign goods are less expensive to South Africans (imports are cheaper). Statement 4 is correct. South African goods are more expensive to foreigners and exports will decrease.

4. The correct option is 3. An increase (or appreciation) of the nominal exchange rate between RSA and the USA implies that fewer rands must be paid for a dollar. South African exports become relatively more expensive to Americans, leading to lower exports and a trade deficit if the Marshall-Lerner condition holds. Remember that a trade deficit exists when imports exceed exports.

5. The correct option is 5. Statements a, c and d are correct. Statement b is incorrect. If the increase in the price of domestic goods rises faster than the price of foreign goods and E is unchanged, the real exchange rate **increases** and a real **appreciation** take place. Statement e is incorrect. If the real exchange rate decreases USA goods are relatively more **expensive** than SA goods in South Africa.

6. The correct option is 1. A **trade** deficit indicates that merchandise imports exceed merchandise exports. Note that the difference between government spending and tax revenue (government income) refers to the budget. For example, if government spending exceeds tax revenue a budget deficit occurs. Therefore statements 2 and 4 are incorrect.

7. The correct option is 2. Whether financial market participants will buy RSA or USA bonds, depends on the difference in the interest rate and also the expected changes in the exchange rate. Although the interest rate is higher on USA bonds, it does not necessarily follow that USA bonds are a better investment. The difference between the RSA interest rate (8%) and the USA interest rate (11%) in this case is 3% (11% – 8%). Thus, if the expected appreciation of the rand is more than 3% (e.g. 4%) financial market participants will buy RSA bonds.
   Why? By holding RSA bonds, the investor will get lower interest payments, but the dollar value of the investment (principle and interest) will be worth more at the end of the period because of the appreciation of the rand, making investment in RSA bonds more attractive than investing in USA bonds. Also work through activity 5.4 in TL102.

8. The correct option is 3. Statements b and c are correct. Depreciation in the nominal exchange rate implies that the rand is worth less in terms of dollars than before in other words you must pay more rand for one dollar (or fewer dollars for a rand). The rand becomes less expensive to foreigners making South African exports relatively cheaper and foreign currency is more expensive to South Africans making imports relatively more expensive. Therefore, if the SA rand depreciates against the USA dollar, it leads to **less imports** of goods and services and **more exports** of goods and services.

9. The correct option is 5. Diagrams A and D illustrates the depreciation of the rand against the dollar. See section 6.4 in the study guide.

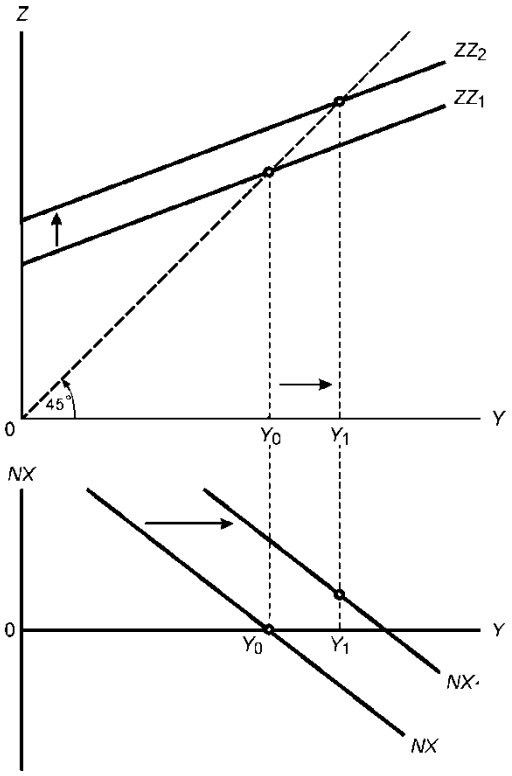
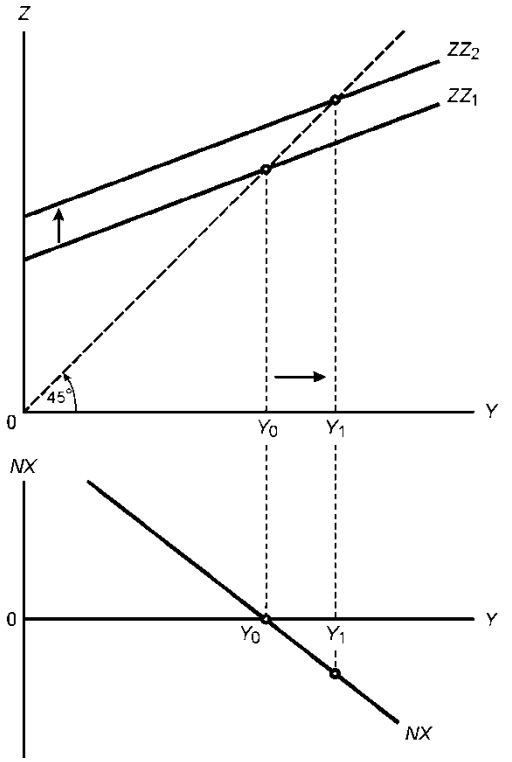
10. The correct option is 2. Make sure that you know the difference between the domestic demand for goods and the demand for domestic goods. An increase in the demand for domestic goods takes place if exports increase. An increase in the domestic demand for goods takes place when imports increase.

11. The correct option is 3. See the discussion of the current account of the balance of payments in section 18.2 in the prescribed book. Only statement 3 is correct. If exports are less than imports a trade deficit occurs. Statements 4 and 5 refer to the difference between government spending and government revenue (taxes).

12. The correct option is 3. The determinants of exports are $Y^*\downarrow \rightarrow X\downarrow$ and $\varepsilon\uparrow \rightarrow X\downarrow$. See section 6.1 of the study guide.

13. The correct option is 3. To achieve a higher output level and a trade surplus the ZZ curve must shift upwards and the NX curve must shift to the right. Statement 1 is incorrect since a reduction in taxation will cause a movement along the NX curve and an increase the trade deficit. Statement 2 is incorrect since the ZZ curve will shift downwards decreasing the output level. Statement 3 is correct and statement 4 is incorrect since a depreciation will lead to an increase in exports, shifting the ZZ curve upwards and the NX curve will shift to the right and because of the Marshall-Lerner condition a trade surplus occurs. The Marshall-Lerner condition holds if the positive effect on the trade balance (of an increase in exports and a decrease in imports), outstrips the negative effect (of an increase in the imports bill and an increase in imports due to $X\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow \rightarrow IM\uparrow$) and results in an improvement of the trade balance ($NX\uparrow$).

14. The correct option is 1. The completed diagrams will look as follows:

An increase in foreign demand	An increase in domestic demand
	

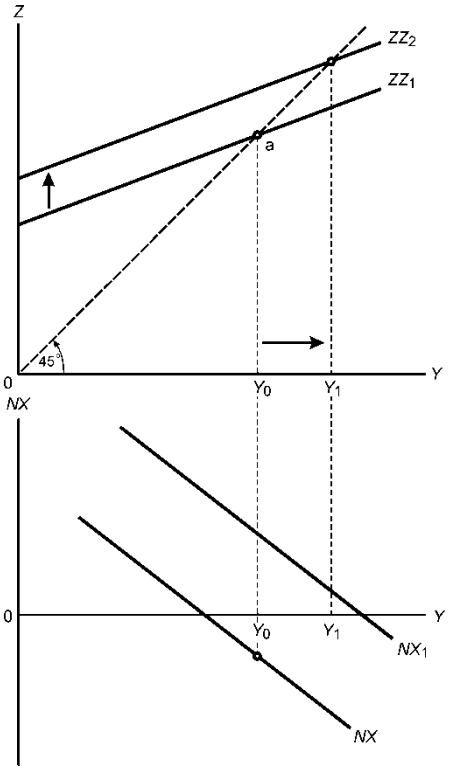
In both cases the ZZ_1 curve shifts upwards and increase the level of output and income. Therefore statements a and c are correct.

15. The correct option is 3. Only statements b, d and e are correct. See the diagrams in answer 14 above. In the case of an increase in foreign demand (e.g. an increase in exports) the NX curve will shift to the right.
The chain of events will be as follows: X↑ → Z↑ → Y↑ → IM↑.

We assume the positive effect of an increase in exports on the trade balance, however, outstrips the negative effect of an increase in imports. The trade balance thus **improves** (NX↑).

In the case of an increase in domestic demand (e.g. an increase in government spending) there will be a movement along the NX curve. The chain of events will be as follows:
G↑ → Z↑ → Y↑ → IM↑ → NX↓ and a trade deficit therefore occur.

16. The correct option is 5. The completed diagram in the case of a depreciation of the domestic currency will look as follows:



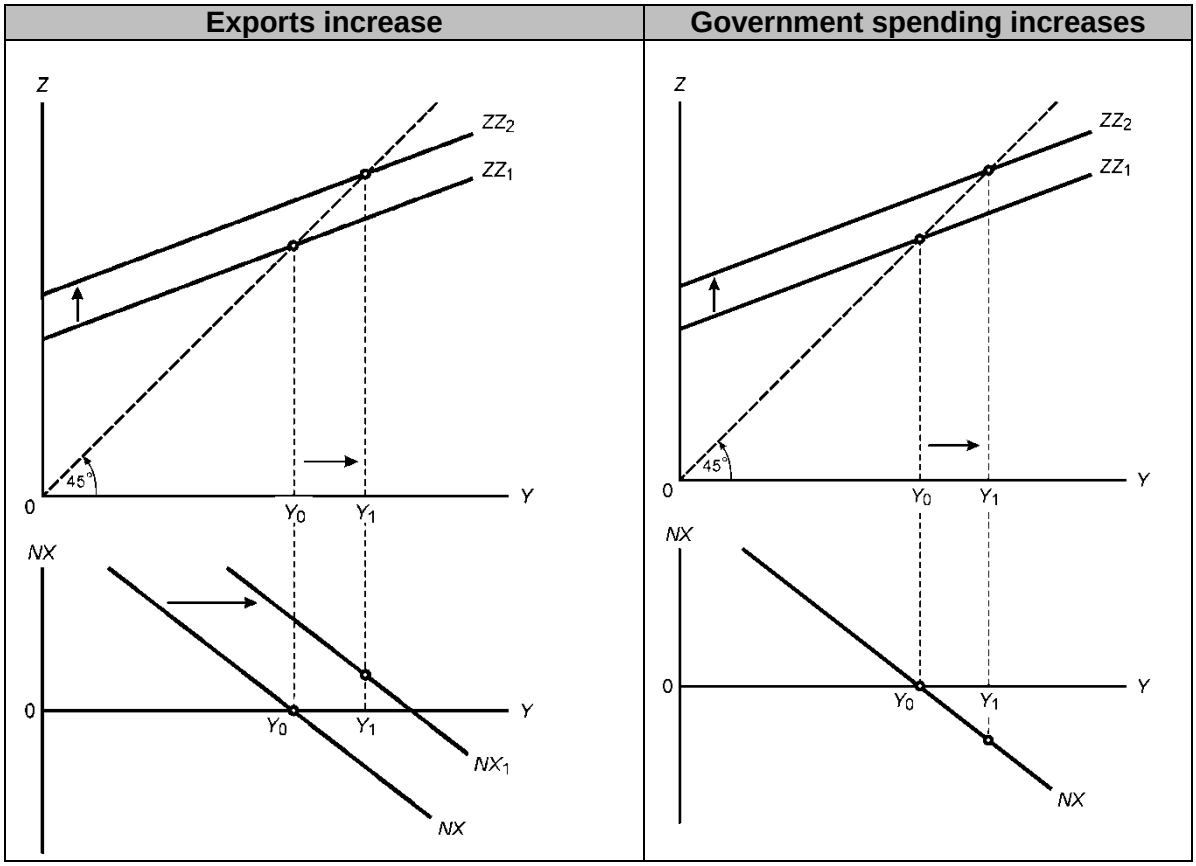
When working with depreciation always remember we assume the Marshall-Lerner condition holds. For the Marshall-Lerner condition to hold, a real depreciation must eventually lead to an increase in net exports. For this to occur, the positive effect on the trade balance (of increase in exports and a decrease in imports due to the rand becoming relatively weaker) must outstrip the negative effect (increase in imports bill and increase in imports due to X↑ → Z↑ → Y↑ → IM↑). Therefore, given that the Marshall-Lerner condition holds, a depreciation results in an improvement in the trade balance and the level of output and income. The level of output and income increases since the demand for domestic goods increases in the economy. The increase in the demand for domestic goods is the result of a rise in exports, which increases the demand for goods and the level of output. The chain of events will be as follows:

X↑ → Z↑ → Y↑

The switching of expenditure from foreign goods (which are now more expensive) to domestically produced goods, results in a higher demand for domestic goods and a higher level of output and income. Only statement 5 is therefore correct.

17. The correct option is 1. See the explanation of the meaning of the Marshall-Lerner condition under answer 16 above.

18. The correct option is 3. The completed diagrams will look as follows:



The correct chain of events in the case of an increase in exports is as follows:
X↑ → Z↑ → Y↑ → IM↑ → NX↑

19. The correct option is 3. The chain of events in the case of an increase in government spending is as follows:
G↑ → Z↑ → Y↑ → IM↑ → NX↓

20. The correct option is 4. See section 7.1 of the study guide. The impact of a change of the nominal exchange rate on the demand for goods and the level of output in the goods market in an open economy can be illustrated by the following chain of events: E↓ → X↑ → NX↑ → Z↑ → Y↑.
The opposite is also true. Note that the chain of events will start with the nominal exchange rate since the question refers to the impact of a change in the nominal exchange rate on income (Y).

21. The correct option is 3. See section 7.3 of the study guide. In the IS-LM model for an open economy, a downward movement along the IS curve implies a decrease in the interest rate, a depreciation of the exchange rate and an increase in exports.

22. The correct option is 2. According to the interest-parity relation a higher domestic interest rate leads to an appreciation of the nominal exchange rate (i↑ → E↑). The opposite will also be true (i↓ → E↓).

23. The correct option is 4. Statements a and c are correct. An increase in the domestic interest rate relative to the interest rate in the rest of the world, *ceteris paribus*, will cause domestic bonds to become relatively more attractive and a capital inflow occurs. This capital inflow increases the demand for the domestic currency and the exchange rate appreciates.

24. The correct option is 4. The chain of events is as follows:
E↓ → X↑ → NX↑ → Z↑ → Y↑

25. The correct option is 4. Statements a and d are correct. Expansionary fiscal policy and contractionary monetary policy will cause an increase in the interest rate which leads to an appreciation in the exchange rate and the net exports of a country to worsen. If net exports worsen, it means that the value of imports exceeds the value of exports. In the case of *expansionary fiscal policy* the chain of events will be as follows:

Impact is first on the goods market

$G\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$

$Y\uparrow \rightarrow C\uparrow$

$Y\uparrow \rightarrow I\uparrow$

Then the impact on the financial market

$Y\uparrow \rightarrow M^d\uparrow \rightarrow i\uparrow$

Back to the goods market

$i\uparrow \rightarrow I\downarrow$

$Y\uparrow \rightarrow I\uparrow$

Impact on the exchange rate and trade balance

$i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$

$E\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$

$Y\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$

In the case of *contractionary monetary policy* the chain of events will be as follows:

Impact is first on the financial market

$M\downarrow \rightarrow M/P\downarrow \rightarrow i\uparrow$

Then the impact on the goods market

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

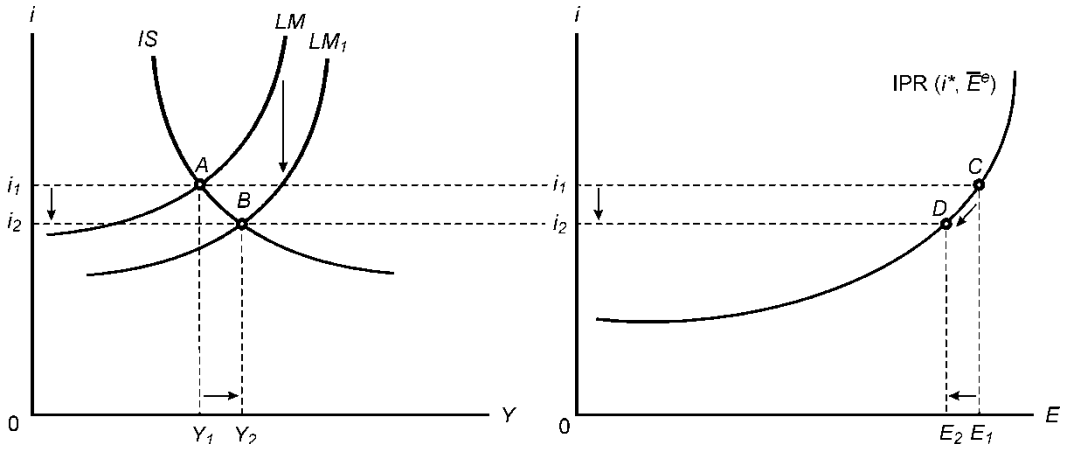
Impact on the exchange rate and trade balance

$i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$

$E\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$

$Y\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$ (we assume this effect is outstripped and overall the trade balance deteriorates $NX\downarrow$)

26. The correct option is 2. In the case of an expansionary monetary policy the LM curve will shift downwards. The completed diagram will look as follows:



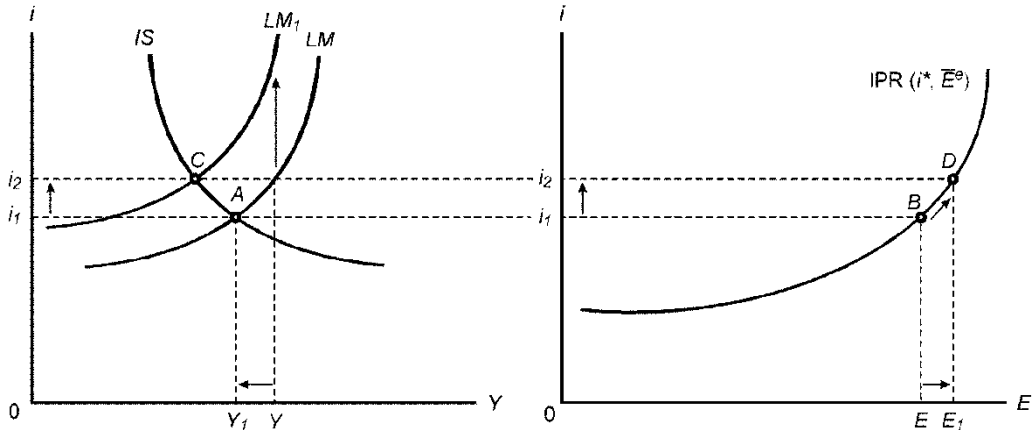
A decrease in the domestic interest rate relative to the interest rate in the rest of the world, *ceteris paribus*, will cause domestic bonds to be less attractive and a capital outflow exists. The capital outflow leads to a decrease in the demand for the domestic currency and the exchange rate depreciates. A depreciation of the exchange rate will lead to an improvement in the trade balance because we assume the Marshall-Lerner condition holds.

The chain of events in this case is represented as follows:

$i\downarrow \rightarrow Capital_{outflow} \rightarrow E\downarrow \rightarrow X\uparrow \rightarrow NX\uparrow$

27. The correct option is 1. A decrease in the money supply implies a contractionary monetary policy. The LM curve will shift to the left causing an increase in the interest rate. The increase in the interest rate causes a capital inflow, an increase in the demand for rand, an appreciation of the exchange rate, a decrease in exports, an increase in imports and a deterioration of the trade balance. See the explanation for answer 26 above. The chain of events in this case is represented as follows:
$i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$
$E\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$
$Y\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$ (we assume this effect is outstripped and overall the trade balance deteriorates $NX\downarrow$)

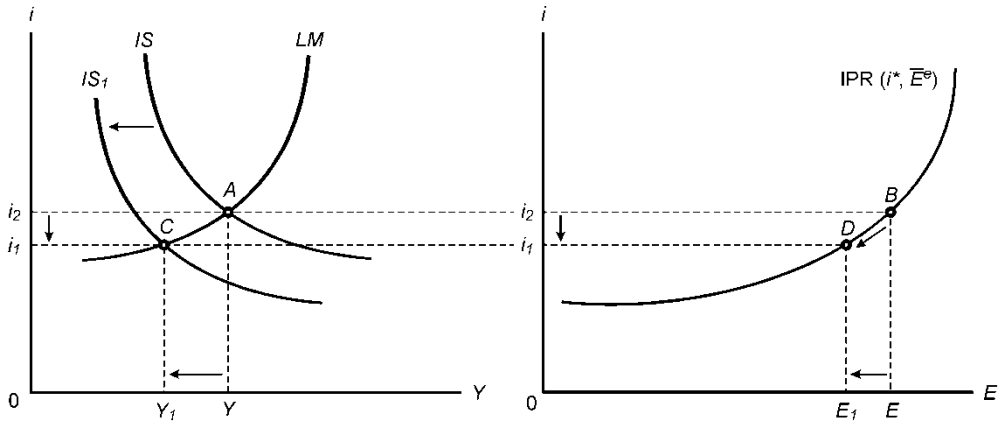
The completed diagram will look as follows:



28. The correct option is 4. A decrease in government spending is the same as a fiscal contraction. Work thoroughly through the example of an increase in government spending in section 7.4 of the study guide. Note that this question 28 has referred to the opposite direction, namely a decrease in government spending. The IS curve will shift to the left and all the variables will therefore change in the opposite direction. See also the explanation and chain of events under answer 29.

29. The correct option is 5. Statements a, c, d and e are correct.

The impact of a contractionary fiscal policy in an open economy causes the IS curve to shift to the left (and not the LM upwards) as indicated in the diagram below.



We assume a decrease in government spending. The chain of events will be as follows:

Impact is first on the goods market
$G\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$
$Y\downarrow \rightarrow C\downarrow$
$Y\downarrow \rightarrow I\downarrow$
Then the impact on the financial market
$Y\downarrow \rightarrow M^d\downarrow \rightarrow i\downarrow$
Back to the goods market
$i\downarrow \rightarrow I\uparrow$
$Y\downarrow \rightarrow I\downarrow$
Impact on the exchange rate and trade balance
$i\downarrow \rightarrow E\downarrow \rightarrow X\uparrow \rightarrow NX\uparrow$
$E\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$
$Y\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$

30. The correct option is 1. All the statements are correct.

31. The correct option is 2. Statements a and b are incorrect. An increase in the money supply will shift the LM curve downwards and leads to an improvement in the trade balance. Statement c is correct. An increase in government spending will shift the IS curve to the right, output and income will increase which will lead to an increase in the demand for money and consequently an increase in the interest rate. A positive relationship exists between the interest rate and the exchange rate and the nominal exchange rate will therefore appreciate. Statement d is incorrect. Expansionary fiscal policy will lead to deterioration in the trade balance. See the chain of events in question 25 above. Statement e is correct. Expansionary monetary policy will lead to an improvement in the trade balance:
$M\uparrow \rightarrow M/P\uparrow \rightarrow i\downarrow$
$i\downarrow \rightarrow Capital_{outflow} \rightarrow E\downarrow \rightarrow X\uparrow \rightarrow NX\uparrow$
$E\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$
$Y\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$ (we assume this effect is outstripped and overall the trade balance improves $NX\uparrow$)

Questions 32 to 34 are based on the following comparison between the impact of a contractionary fiscal policy with a contractionary monetary policy in the IS-LM model for an open economy:

	Contractionary fiscal policy	**Contractionary monetary policy**
Exchange rate	Depreciate	Appreciate
Capital flows	Outflow	Inflow
Exports	Higher	Lower
Trade balance	Improves	Worsens

To answer this type of question it is necessary to use chain of events. The chain of events of a contractionary fiscal policy and contractionary monetary policy the IS-LM model in an open economy will be as follows:

Contractionary fiscal policy	**Contractionary monetary policy**
Impact is first on the goods market $G\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$ $Y\downarrow \rightarrow C\downarrow$ $Y\downarrow \rightarrow I\downarrow$ **Then the impact on the financial market** $Y\downarrow \rightarrow M^d\downarrow \rightarrow i\downarrow$	**Impact is first on the financial market** $M\downarrow \rightarrow M/P\downarrow \rightarrow i\uparrow$
Back to the goods market $i\downarrow \rightarrow I\uparrow$ $Y\downarrow \rightarrow I\downarrow$	**Then the impact on the goods market** $i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$ $Y\downarrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$

Impact on the exchange rate and trade balance	**Impact on the exchange rate and trade balance**
i↓ → $Capital_{outflow}$ → E↓ → X↑ → NX↑ E↓ → IM↓ → NX↑ Y↓ → IM↓ → NX↑	i↑ → $Capital_{inflow}$ → E↑ → X↓ → NX↓ E↑ → IM ↑→ NX↓ Y↓ → IM ↓→ NX↑ (we assume this effect is outstripped and overall the trade balance deteriorates NX↓)

32. The correct option is 4. The reason for the depreciation of the exchange rate for a contractionary fiscal policy is because of the decrease in the domestic interest rate relative to the world interest rate while for a contractionary monetary policy the exchange rate appreciates because of the increase in the domestic interest rate relative to the world interest rate. See the chain of events above.

33. The correct option is 2. The reason for the capital outflow for a contractionary fiscal policy is because of the decrease in the interest rate while for contractionary monetary policy there is a capital inflow because of the increase in the interest rate.

34. The correct option is 1. The reason for higher exports in the case of a contractionary fiscal policy is because of the depreciation of the exchange rate while for monetary policy exports are lower since the exchange rate appreciates.

35. The correct option is 5. Remember that in the **financial account**, international transactions in assets and liabilities are recorded. Statement a is incorrect. The decline in the exports will not be recorded in the financial account of the balance of payments. Statement b is correct. A higher interest rate in South Africa relative to the rest of the world might have caused an inflow of capital. Statement c is incorrect. An appreciation of the exchange rate might have caused a higher demand for rands.

2. ANSWERS TO SELF-ASSESSMENT ASSIGNMENT 05

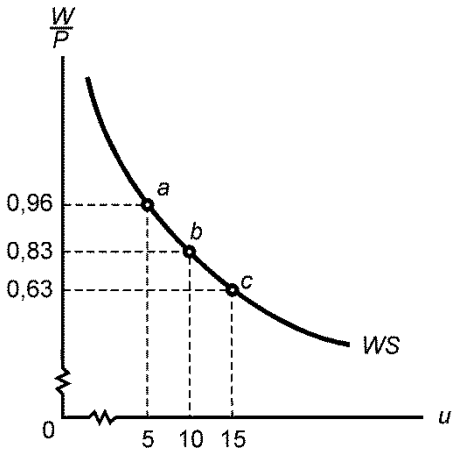
Assignment 05 was based on learning units 8 and 9. If you experience any problems with these sections, work through the activities in TL102 again.

The correct answers are:

Question		***Question***		***Question***	
1	1	**12**	5	**23**	1
2	1	**13**	4	**24**	3
3	5	**14**	5	**25**	5
4	3	**15**	3	**26**	5
5	1	**16**	2	**27**	2
6	4	**17**	3	**28**	4
7	5	**18**	3	**29**	5
8	4	**19**	5	**30**	2
9	3	**20**	1	**31**	3
10	4	**21**	1	**32**	1
11	3	**22**	3	**33**	5

1. The correct option is 1. These assumptions are set out in section 6.4 of the prescribed textbook and section 8.4 of the study guide. In our analysis of the labour market we assume that labour is the only factor of production used in the production of output, labour productivity is constant, the price of oil and other raw materials stay constant and that the price of products set by firms is based on cost plus a mark-up. We look at the impact of a change in the oil price in section 9.6 of the study guide (MO001).

2. The correct option is 1. Statements a and c are correct. See section 8.5 in the study guide. Note the negative relationship between the targeted real wage and the unemployment rate in the diagram below:



Statements b and d are also correct. See section 8.1 in the study guide.

3. The correct option is 5. Factors a, b, d and e are correct. The more expensive it is to dismiss workers, a higher level of output and a lower unemployment rate, an increase in unemployment benefits and labour laws that protect workers from being dismissed are factors that will increase the bargaining position of workers. Statement c is incorrect. A lower level of output and a higher unemployment rate ($Y\downarrow \rightarrow N\downarrow \rightarrow u\uparrow$) will decrease the bargaining position of the workers.

4. The correct option is 3. Statements a, c and d are correct. Statement b is incorrect. An increase in the nominal wage for a given general price level will increase the real wage. Real wage = W/P. Therefore if W increases, and P stays constant, W/P will increase.

5. The correct option is 1. Statements a to d are correct. All the mentioned institutional factors play an important role in the way wages are determined in a country.

6. The correct option is 4. Only the unemployment rate, according to the wage-setting relationship, is **not** an institutional factor (indicated by z in the formula below) that may affect the outcome of wage setting. The wage-setting relationship is as follows:

$$W = P^{e}F(u,z)$$
$$\quad + \quad -,+$$

7. The correct option is 5. Statement a is incorrect. Workers are not able to determine the real wage through nominal wage bargaining. The wage-setting relationship does not tell us what the actual real wage will be. Workers can try to achieve a desired or targeted real wage by bargaining for a nominal wage, but whether the desired or targeted real wage is achieved will depend on what happens to the price level. And the price level is determined by the mark-up used by firms. Therefore statement b is also incorrect. Through an increase in their nominal wages workers are not able to increase their real wages. Statement c is correct. An increase in the mark-up by firms causes a decrease in real wages. See the following example:

Say for instance the mark-up is 5 %, then the implied real wage is

$$\frac{W}{P} = \frac{1}{1+m} = \frac{1}{1+0.05} = 0.95$$

If the mark-up increases to 10%, the implied real wage decreases to

$$\frac{W}{P} = \frac{1}{1+m} = \frac{1}{1+0.1} = 0.90$$

Statement d is correct. A positive relationship exists between the mark-up and the price per unit:

P = (1 + m)W
+ +

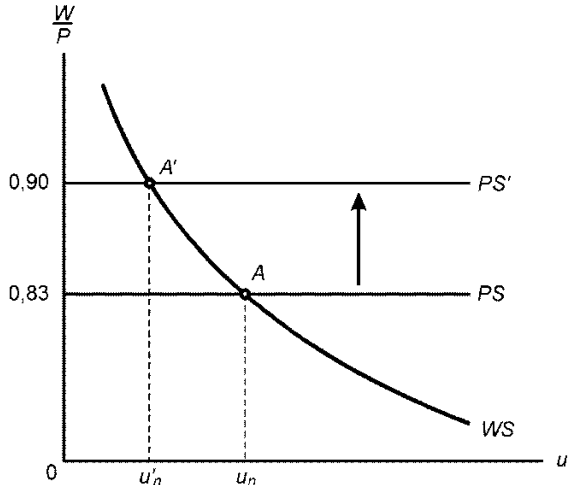
8. The correct option is 4. All the statements are correct. This question is based on section 8.4 in the study guide. Note that statements a and b mean the same thing. Statement c, d and e are captured in the following equation: P = (1 + m)W.

9. The correct option is 3. Statement a is correct since it is captured in the following equation: P = (1 + m)W. Statement b is incorrect. Workers can try to achieve a desired or targeted real wage by bargaining for a nominal wage, but whether it is achieved will depend on what happens to the price level. And the price level is determined by the mark-up used by firms.

Statement c is correct. A decrease in firms' mark-up, will cause a lower price level, and for a given nominal wage (W), a higher real wage (see the numerical example under section 8.5 "The price-setting relation" in the study guide). Labours' claim is now higher and that of the firm lower.

Statement d is correct. For example: W/P = 1/1 + m
Say the mark-up = 20%, thus 1/1+ 20% = 1/1.2 = 0.83
The mark-up decreases now to 10%, thus 1/1+ 10% = 1/1.1 = 0.90
The PS curve therefore will shift upwards if the mark-up by firms decreases.

Graphically it can be presented as follows:



10. The correct option is 4. A positive relation means that if one variable increases (or decreases) the other variable also increases (or decreases).
Statements a, b and e are based on the following equation:
$W = P^e F(u,z)$
+ –,+

Statement a is therefore correct, statement b is incorrect and statement e is correct.

Statements c and d are based on the following equation:

$P = (1 + m)W$
$\quad\quad + \;\; +$

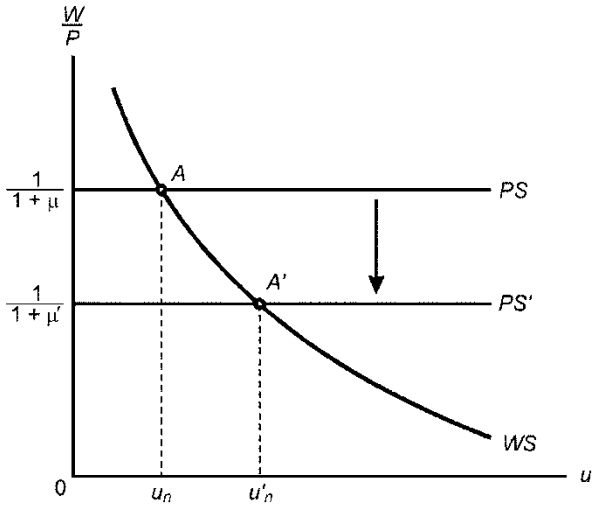
Both statements c and d are correct.

11. The correct option is 3. The factors that will shift the WS curve to WS^1 are an increase in unemployment benefits, labour laws that protect workers from being dismissed and a better bargaining position of workers. Statements a and b are incorrect since a higher unemployment rate and a higher level of output will cause a movement along the WS curve.

12. The correct option is 5. The factors that will cause a shift of the WS curve are any factor that changes the bargaining position of workers other than the unemployment rate. A change in the unemployment rate will cause a movement along the WS curve. See also section 8.5 in the study guide.

    Factors that will increase the bargaining position will shift the WS curve upwards while a factor that hampers/worsens the bargaining position will shift the WS curve downwards. Statement a is incorrect. A lower mark-up will shift the PS curve. Statement b is incorrect. A lower unemployment rate will cause a movement along the WS curve. Statement c is incorrect. A lower nominal wage is not a factor that will shift the WS curve. Statement d is correct. Labour laws that provide workers with less protection against layoffs will shift the WS curve downwards. Statement e is incorrect. Better unemployment benefits will shift the WS curve upwards.

13. The correct option is 4. The diagram below illustrates a higher mark-up (a higher mark-up will shift the PS curve downwards), a decrease in the real wage accompanied by an increase in the natural rate of unemployment from point u_n to u'_n and an increase in the actual price level (if P increases W/P will decrease).

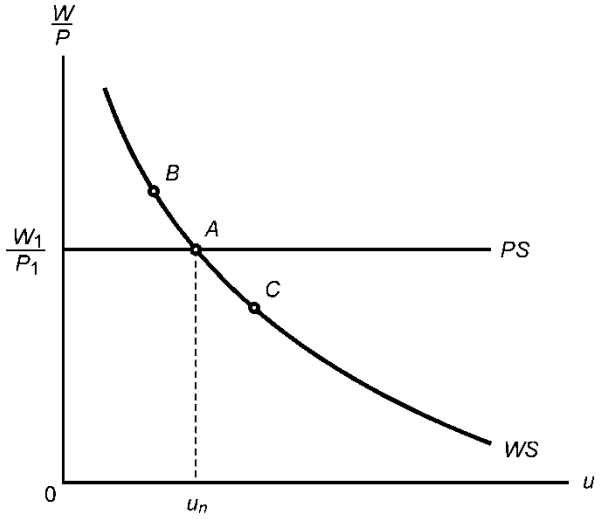


    Statement b is incorrect since a lower mark-up will shift the PS curve upwards. Statement d is incorrect. An increase in the workers' bargaining position will shift the WS curve and not the PS curve.

14. The correct option is 5. Only statement b is correct. Statement a is incorrect. A lower mark-up will shift the PS upwards. Statement c is incorrect. A lower unemployment rate will cause an upward movement along the WS curve. Statement d is incorrect. A higher unemployment rate will cause a downward movement along the WS curve.

15. The correct option is 3. See the diagram below. Statement a is correct. At point C the unemployment rate is higher which decreases the bargaining position of workers and the nominal wage they can

bargain for decreases. Statement b is incorrect. The unemployment rate is higher which decreases the bargaining position of workers and the targeted real wage implied by price setting decreases. Statement c is correct. The targeted real wage is lower than the implied real wage. Statement d is therefore incorrect.



16. The correct option is 2. A decrease in the level of output (Y) will cause the level of unemployment to increases (because Y decreases, N will decrease and u will increase) which causes a decline in the bargaining position of workers resulting in a lower bargained nominal wage: Y↓ → N↓ → u↑ → W↓.

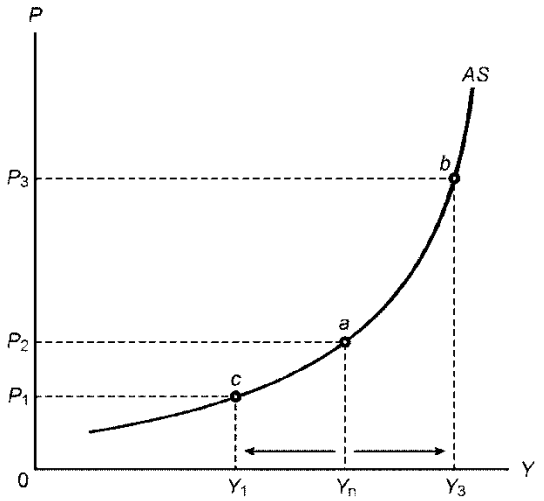
17. The correct option is 3. The chain of events that describes the impact of an increase in output on the labour market is: Y↑ → N↑ → u↓ → W↑. As the level of output increases, employment rises and unemployment decreases. A decline in unemployment strengthens the bargaining power of workers, and nominal wages increase. Note that this is the opposite of question 16.

AS-AD model

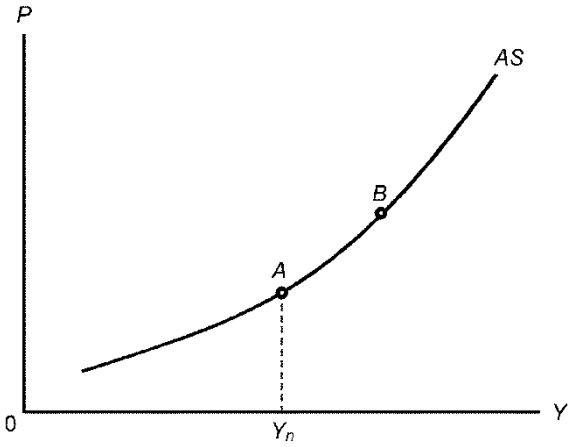
18. The correct option is 3. The AS curve is represented by the following chain of events:
Y↓ → N↓ → u↑ → W↓ → P↓
The opposite is also true. See question 19 below.

19. The correct option is 5. The AS curve has a positive slope because of the following chain of events: Y↑ → N↑ → u↓ → W↑ → P↑. An increase in Y leads to an increase in prices, there is a positive relationship between the two variables.

20. The correct option is 1. All the statements are correct. This question refers to the properties of the AS curve and the factors that will shift the AS curve. Remember that the aggregate supply curve is derived from the wage-setting and price-setting relationships, where it was assumed that the expected price level is given. A given AS curve passes through a point (point a in the above diagram) where the level of output is equal to the natural level of output ($Y = Y_n$) and the actual price level = the expected price level ($P = P^e$). Therefore in this case is $P_2 = P^e$.

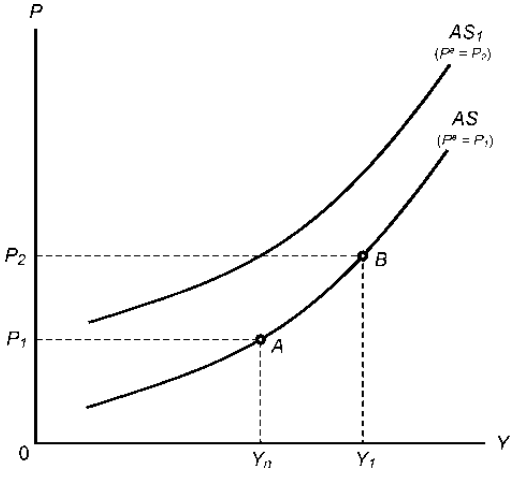


Questions 21 and 22 are based on the following AS curve:



21. The correct option is 1. As already indicated in question 20, an important property of the AS curve is that a given AS curve passes through a point where the level of output is equal to the natural level of output ($Y = Y_n$) and the actual price level = the expected price level ($P = P^e$). Therefore in this case at point A the actual price level = the expected price level ($P = P^e$). At point B compared to point A the expected price level is therefore lower than the actual price level.

22. The correct option is 3. See the diagram below. Since the expected price level P_1 is lower than the actual price level P_2, at point B workers will in the medium (to long) run respond to this by increasing their nominal wage demands and the AS curve shifts upwards showing that at each output level the price level is higher.



23. The correct option is 1. See section 9.1 of the study guide for the factors that will shift the AS curve versus the factors that will cause a movement along the AS curve. It is only an increase in the expected price level that will cause an upwards shift of the AS curve.

24. The correct option is 3. See the section “Derivation of the AD curve” in the study guide. The AD curve shows a negative relationship between the price level and the level of output and represents combinations of the price level and the level of output and income where the goods and financial markets are in equilibrium. In terms of a chain of events, the derivation of the aggregate demand curve can be represented as follows:

    $P\uparrow \rightarrow M/P\downarrow \rightarrow i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$. Therefore only statement 3 is correct. The opposite will also be true: $P\downarrow \rightarrow M/P\uparrow \rightarrow i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$.

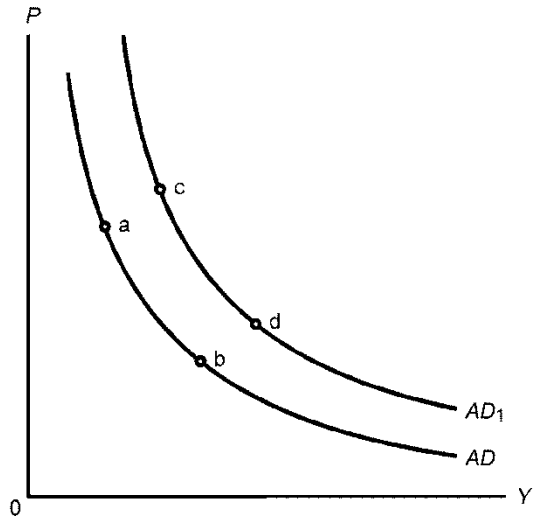
25. The correct option is 5. Note that statements a and d are the opposite of each other. The AD curve is represented by the following chain of events:

    $P\downarrow \rightarrow M/P\uparrow \rightarrow i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$
    and
    $P\uparrow \rightarrow M/P\downarrow \rightarrow i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$

    See also the derivation of the AD curve.

26. The correct option is 5. See the section “Shifts of the AD curve” in the study guide. A shift in the AD curve is caused by a change in any of the autonomous (or exogenous) variables, such as taxes, government spending or the nominal money supply. Exogenous variables include factors such as autonomous consumption and autonomous investment. Statements a and b are therefore incorrect while statements c and d are correct.

27. The correct option is 2.



    To answer this question you must use the following chain of events since when comparing point a with point b on curve AD in the diagram above there was a decrease in the price level:
    $P\downarrow \rightarrow M/P\uparrow \rightarrow i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$

    Therefore the real money supply is higher at point b, the interest rate is lower at point b, investment spending is higher at point b and the demand for goods is higher at point b.
    Statement d is incorrect since a change in government spending will shift the AD curve.

28. The correct option is 4. Statement a is correct and statement b is incorrect. Read the question again. The assumption was that the rightward shift of the AD was due to an expansionary fiscal policy, in other words, an increase in government spending and/or decrease in taxes. Therefore, comparing point b on curve AD with point d on curve AD_1 the level of government spending is higher at point d but the level of taxation must be lower at point d.

    The chain of events will be as follows:

    $G\uparrow$(or $T\downarrow \rightarrow Y_D\uparrow$) $\rightarrow Z\uparrow \rightarrow Y\uparrow \rightarrow M^d\uparrow \rightarrow i\uparrow$

    Therefore statements c and d are also correct. The demand for goods (Z) and the interest rate (i) are higher at point d.
    Statement e is incorrect. There will be no change in the nominal money supply.

29. The correct option is 5. Read the question carefully. It refers to the events that describe the adjustment from the short to the medium run to long in the case of an expansionary monetary policy, in other words, M↑. The same example will be found under section 9.4 in the study guide and figure 7.7 in the textbook.
    In the short term the initial events will be in the financial market: $M\uparrow \rightarrow M/P\uparrow \rightarrow i\downarrow$; then in the goods market: $i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$ and then in the labour market:
    $Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow W\uparrow \rightarrow P\uparrow$. In the AS-AD model, this is indicated by an upward movement along the AS curve and a **short run equilibrium** position is reached at point A' in figure 7.7 in the textbook. (But the question does not refer to the short run!)

    In the medium run, the following will happen: At point A' in figure 7.7, the expected price level on which workers based their real wage negotiations turned out to be lower than the actual price level ($P^e < P$). Workers revised their expected price level upwards and negotiated for higher wages. In reaction to the higher nominal wages, firms increased the price level. Therefore the chain of events is as follows in the labour market: $P^e\uparrow \rightarrow W\uparrow \rightarrow P\uparrow$.

    In the ***financial and goods market the following will happen:*** As the price level increases, the real money supply decreases in the financial market leading to a rise in the interest rate.

    The increase in the interest rate causes firms to reduce their investment spending, and aggregate demand and the level of output and income therefore decrease. Therefore the chain of events is as follows: $P\uparrow \rightarrow M/P\downarrow \rightarrow i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$.

    Therefore alternative 5 is the correct option.

	Labour market	**Financial market**	**Goods market**
5.	$P^e < P$: $W\uparrow \rightarrow P\uparrow$	$M/P\downarrow \rightarrow i\uparrow$	$I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$

30. The correct option is 2. The question refers to the events in the **medium run** in the case of an expansionary monetary policy in the labour market.

    In the case of expansionary monetary policy the following chain of events will take place in the *short run*:
    Financial market: $M\uparrow \rightarrow M/P\uparrow \rightarrow i\downarrow$
    Goods market: $i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$
    Labour market: $Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow W\uparrow \rightarrow P\uparrow$

But the question refers to the **medium** run. In the medium run the chain of events will be as follows:

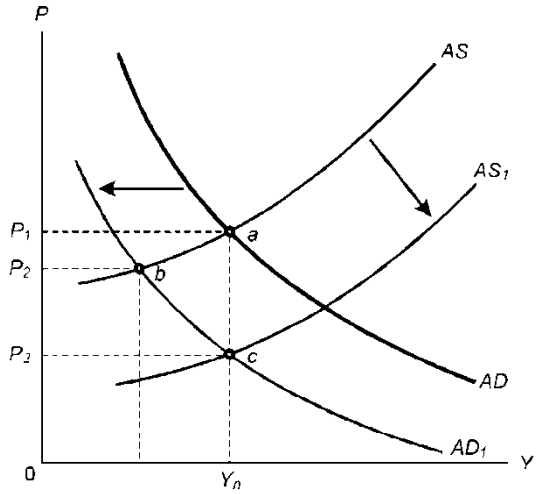
Labour market: $P^e\uparrow \rightarrow W\uparrow \rightarrow P\uparrow$.
The expected price level on which workers based their real wage negotiations turned out to be lower than the actual price level. They revised their expected price level upwards and negotiated for higher wages. In reaction to the higher nominal wages, firms increased the price level.

Therefore, option 2 is correct: $P^e < P$: $W\uparrow \rightarrow P\uparrow$

31. The correct option is 3. Note that this question also refers to **medium run** in the case of an expansionary monetary policy, but now in the financial market. The chain of events will be as follows: $M/P\downarrow \rightarrow i\uparrow$. Why? As the price level increases, the real money supply decreases in the financial market leading to a rise in the interest rate.

32. The correct option is 1. Note that this question also refers to **medium run** in the case of an expansionary monetary policy, but now in the goods market. The chain of events will be as follows:
$I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$
The increase in the interest rate (see answer 31) causes firms to reduce their investment spending, and aggregate demand and the level of output and income therefore decrease.

33. The correct option is 5. The diagram below represents the impact of a contractionary fiscal policy, in other words a decrease in government spending.



Statement a is incorrect since in the short run the interest rate will decrease in the financial market. The complete chain of events will be as follows:

$G\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$
$Y\downarrow \rightarrow M^d\downarrow \rightarrow i\downarrow$

$i\downarrow \rightarrow I\uparrow$
$Y\downarrow \rightarrow I\downarrow$

Statement b is incorrect. The movement along the AD curve from point b to point c is the result of the events in the labour market in the medium run and not the short run.

Statement c is correct. In the medium run, the AS curve will shift from AS to AS_1 because of the following chain of events: $P^e\downarrow \rightarrow W\downarrow \rightarrow P\downarrow$.

The expected price level on which workers based their real wage negotiations turned out to be higher than the actual price level. Workers revise their expected price level downwards and the nominal wage decreases. In reaction to the lower nominal wages, firms reduce their price levels.

Statement d is incorrect. Comparing the equilibrium point c with the initial equilibrium position a, it is clear that the level of output and income, the level of employment and the unemployment rate are the same as before the decrease in government spending. What is different is that the real money supply is higher (owing to the decrease in the price level), the interest rate is lower (owing to the higher real money supply), investment spending is higher (owing to the lower interest rate) and government spending is lower (by assumption). What has happened in the economy is that the decrease in government spending has been replaced by an increase in investment spending. The real values are therefore different.

Case studies on learning units 5 to 7

Question 1

The correct option is 3. The extract from the *Monetary Policy Review* describes two separate events which will have the same effect on South Africa's trade balance. Firstly "*monetary policy in South Africa remains in a tightening cycle"* tightening of monetary policy is another way of describing a contractionary monetary policy i.e. $M\downarrow \rightarrow M/P\downarrow \rightarrow i\uparrow$ and since there is a positive relationship between the interest rate and the exchange rate, $i\uparrow \rightarrow E\uparrow$ a contractionary monetary policy will lead to an appreciation of the rand. Statement 1 is incorrect because it illustrates an expansionary monetary policy.

The second event describes "policy easing" by the ECB and Bank of Japan, this is another way of describing an expansionary monetary policy. Since the interest rate in the EU and Japan will decline as a result of an expansionary monetary policy, capital will flow from these countries to countries with a relatively higher interest rate and therefore a higher rate of return for capital, such as South Africa who is following a contractionary monetary policy.

Thus the situation in South Africa is as follows; there is an increase in capital inflows due to the increase in the local interest rate following a contractionary monetary policy as well as the increased attractiveness of South African bonds relative to the EU and Japan; the nominal exchange rate increases and the domestic currency appreciates. An appreciation of the domestic currency increases the price of exports and the net exports position worsens. This is illustrated by the following chain of events:
$i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$. Thus option 3 is correct whilst option 4 is incorrect. Option 2 is incorrect because according to the interest parity condition, the domestic exchange rate will respond to a change in the domestic interest rate, not the other way around. In addition, an appreciation of the rand will lead to a decrease in net exports because we assume the Marshall-Lerner condition holds.

Question 2

The correct option is 4. Statement a is incorrect. China is one of South Africa's trading partners therefore a slowdown of its growth will decrease exports since exports are a function of the level of output in South Africa's trading partners. A decrease in exports will decrease the current account balance (also known as trade balance or net exports) since a positive trade balance is where exports exceed imports. Statement b is incorrect. According to the SARB, iron ore makes up close to 7% of South African exports, therefore a decline in the price of this commodity will have a negative impact on the trade balance since for a given number of exports revenue has dropped. Statement c is correct. A sustained depreciation of the rand will have a positive effect on the trade balance assuming the Marshall-Lerner condition holds. Statement d is correct. Crude oil is a good that South Africa imports; therefore a decline in the price of oil will reduce the imports bill and thus have a positive effect on the trade balance. Statement e is incorrect. A faster expansion of the non-tradable sector relative to the tradable sector will result in an increase in imports and a decrease in exports, thus worsening the trade balance. The cumulative effect has been a persistent current account deficit since 2012.

Case studies on learning units 8 and 9

Question 1

a. The diagram given (below) shows the increase in government spending and therefore the stabilisation policy represented by the data is an **expansionary fiscal policy**.

Measured in millions of ZAR

b. Given the data and policy, what will happen in the AS-AD model? Explain in words and by using chain of events what will happen in the short run and in the medium run in the goods market, the financial market and the labour market.

The impact of an **expansionary fiscal policy in the AS-AD model** in the short run and in the medium run in the goods market, the financial market and the labour market will be as follows:

In the short run
Initial events on the goods and financial markets
An increase in government spending initially affects the goods market where the demand for goods and the level of output and income increase. $G\uparrow \Rightarrow Z\uparrow \Rightarrow Y\uparrow$
An increase in output and income increases the demand for money in the financial market and the interest rate rises. $Y\uparrow \Rightarrow M^d\uparrow \Rightarrow i\uparrow$
Whether or not investment spending increases at this stage is ambiguous. While an increase in the interest rate decreases investment spending, an increase in output and income increases investment spending. $i\uparrow \Rightarrow I\downarrow$ $Y\uparrow \Rightarrow I\uparrow$
In terms of the IS-LM model, this is represented by a rightward shift in the IS curve, and in terms of the AS-AD model, this is represented by a rightward shift in the AD curve to AD_1.
In terms of the AS-AD model, an upward movement along the AS curve from point a to point b occurs. This is the **short run equilibrium** position.

In the medium run

Events in the labour market

At point b, the expected price level on which workers based their real wage negotiations turned out to be lower than the actual price level. Workers revise their expected price level upwards and the nominal wage increases. In reaction to the higher nominal wages, firms increase their price levels.

$P^e\uparrow \Rightarrow W\uparrow \Rightarrow P\uparrow$

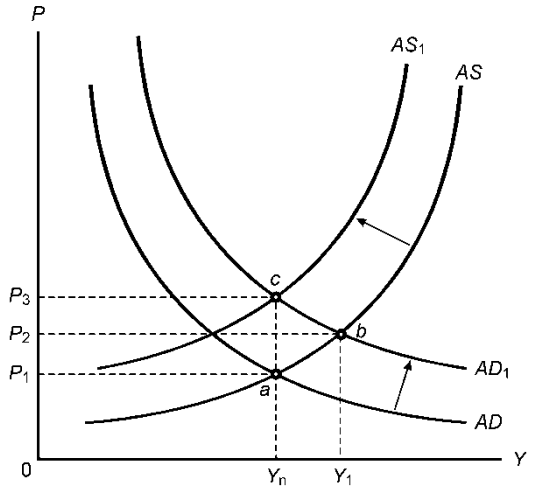
In the AS-AD model, this effect is captured by a leftward shift of the AS curve to AS_1.

Events in the financial and goods market

The increase in the price level causes a decrease in the real money supply and the interest rate rises.
An increase in the interest rate decreases investment spending, the demand for goods and the level of output and income.

$P\uparrow \Rightarrow M/P\downarrow \Rightarrow i\uparrow \Rightarrow I\downarrow \Rightarrow Z\downarrow \Rightarrow Y\downarrow$

In the IS-LM model, this is represented by a downward shift of the LM curve and in the AS-AD model by a movement along the AD_1 curve from point b to pint c. This process continues until point c is reached, where the level of output is at the natural level of output and the unemployment rate by implication is equal to the natural rate of unemployment. **This is the medium run position**.



Question 2

a. The repurchase rate (repo rate) is the rate at which private banks borrow money from the South African Reserve Bank. The repo rate in turn determines the market interest rate on loans.

A decrease in the repo rate decreases the interest rate on loans and, as the interest rate on loans decreases, the amount of loans increase. Consequently, more demand deposits are created and the money supply increases. An increase in the money supply refers to an expansionary monetary policy.

b. The impact of an expansionary monetary policy in the AD-AS model in the short and medium run in the goods market, the financial market and the labour market will be as follows:

In the short run

Initial events in the financial market

The initial effect of an increase in the nominal money supply is on the financial market. To increase the money supply, the central bank buys bonds on the financial market. As a result, the real money supply increases and the interest rate declines.

$M\uparrow \Rightarrow M/P\uparrow \Rightarrow i\downarrow$

Events in the goods market

In the goods market, firms react to the decline in the interest rate by increasing their investment spending. The rise in investment spending increases the demand for goods and, through the multiplier process, the level of output and income increases.

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

In terms of the AS-AD model, this is represented by a rightward shift in the AD curve to AD_1 curve.

Events in the labour market

A rise in the level of output increases the level of employment, and the unemployment rate decreases and the bargaining position of workers increases. Given this rise in the bargaining position of workers, the nominal wage increases. Firms react to this increase in wages by increasing the price level.

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

In the AS-AD model, this is indicated by an upward movement along the AS curve from point a to point b and a **short-run equilibrium** position is reached at point b in the diagram below.

In the medium run

Events in the labour market

At point b, the expected price level on which workers based their real wage negotiations turned out to be lower than the actual price level. They revised their expected price level upwards and negotiated for higher wages. In reaction to the higher nominal wages, firms increased the price level.

$P^e\uparrow \Rightarrow W\uparrow \Rightarrow P\uparrow$

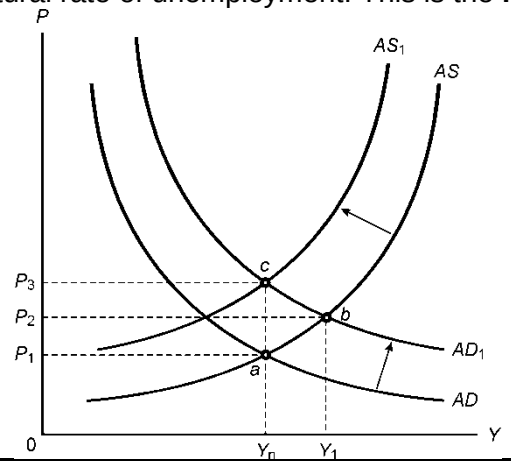
This effect is captured by a shift of the AS curve upwards to AS to AS_1.

Events in the financial and goods market

As the price level increases, the real money supply decreases in the financial market leading to a rise in the interest rate. The increase in the interest rate causes firms to reduce their investment spending, and aggregate demand and the level of output and income therefore decrease.

$P\uparrow \Rightarrow M/P\downarrow \Rightarrow i\uparrow \Rightarrow I\downarrow \Rightarrow Z\downarrow \Rightarrow Y\downarrow$

This is captured by an upward movement along the AD_1 curve. This process continues until point c is reached where the level of output is at the natural level of output, and the unemployment rate by implication, is equal to the natural rate of unemployment. This is the **medium run position.**



Question 3

In both cases the medium run position is reached where the level of output is at the natural level of output and the unemployment rate by implication is equal to the natural rate of unemployment.
Therefore, to answer this question, it is necessary to identify the nominal and real variables in the AS-AD model and to compare the impact of the different policies on these variables.

The following are nominal and real variables in the AS-AD model:

Nominal variables	**Real variables**
nominal money supply (M^S)	real money supply (M/P)
price level (P)	interest rate (i)
nominal wage (W)	investment spending (I)
	demand for goods (Z)
	level of output and income (Y)
	real wage (W/P)

Expansionary fiscal policy: Comparing the medium run equilibrium point with the initial equilibrium position, it is clear that the level of output and income, the level of employment and the unemployment rate are the same as before the increase in government spending. What is different is that the real money supply is lower (owing to the increase in the price level), the interest rate is higher (owing to the lower real money supply), investment spending is lower (owing to the higher interest rate) and government spending is higher (by assumption).What has happened in the economy is that the increase in government spending has been replaced by a decrease in investment spending.

Expansionary monetary policy: The interesting thing about the impact of an expansionary monetary policy is that in the medium run, it is neutral, which means that it only changes nominal variables and not the real variables in the model. Comparing the medium run equilibrium point with the initial equilibrium position it is clear that not only are the level of output and income, the level of employment and the unemployment rate what they were before the increase in the nominal money supply, but the real money supply, the interest rate, investment spending, government spending and the real wage are also equal to their original values. What has changed? In this case, the nominal variables namely the nominal money supply, the nominal wage and the price level, are higher. What happened to these variables in the short and medium run?

Short run	**Medium run**
$\mathbf{M^s\uparrow} \rightarrow M/P\uparrow \rightarrow i\downarrow$	$P^e\uparrow \rightarrow W\uparrow \rightarrow \mathbf{P\uparrow}$
$i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$	$\mathbf{P\uparrow} \rightarrow M/P\downarrow \rightarrow i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$
$Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow \mathbf{W\uparrow} \rightarrow \mathbf{P\uparrow}$	

The nominal variables increase in the medium run

- $M^s\uparrow$ owing to the assumed increase in nominal money supply
- W↑ owing to an increase in employment and then an increase in P^e
- P↑ since the nominal wage is higher

The real variables all remain **unchanged**

- M/P first increases, because of higher M^s, but then starts to decrease because of a higher P
- i first decreases, then increases
- I first increases, then decreases
- Z first increases, then decreases
- Y first increases, then decreases
- W/P remains unchanged throughout the process

The real variables remain unchanged because the increase in the nominal money supply (M^s) is exactly offset by an increase in the price level (P).

In other words, a 10% increase in money supply eventually leads to a 10% increase in the price level, which means that the real variables return to their original values as does the real wage, because the increase in nominal wage is offset by an increase in the price level.

This is referred to as the neutrality of money. An expansionary monetary policy only influences nominal variables (they are higher), while real variables remain unchanged. Neutrality of money does not mean that monetary policy cannot or should not be used to affect output.

As expansionary monetary policy can, for example, help the economy move out a recession and return more quickly to Y_n. However, this is a warning that monetary policy cannot sustain higher output forever (cannot effect real change in the economy) because it returns to the Y_n level.

3. Examination preparation

This tutorial letter forms part of your study material and so you also need to study its content for examination purposes. It is important that you are able to answer questions like those presented in this tutorial letter as well as in TL102 (Workbook). Test yourself on these questions as preparation for the examination.

All the study material such as the tutorial letters which contain the answers to the assignments (the 200-series of tutorial letters), except the prescribed book, is available on *my*Unisa.

Reminder: please work through all the activities in TL102 (Workbook).

We wish you success in your studies!

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