# Tutorial letter 204/2/2016

# Macroeconomics

# ECS2602

## Department of Economics
## Semester 2

Answers to Assignment 04
Answers to Self-assessment  Assignment 05
Information on the examination

BAR CODE

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Dear student

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


## 1. HOW MUCH TIME MUST I SPEND STUDYING ECS2602?

ECS2602 is a semester module with a credit value of 12 that must be completed for a B Com degree in Economics. Each credit is equivalent to 10 notional hours. This means that to be successful, the **average** student must spend 120 notional hours on this module. The notional hours includes time that is spent studying the learning units, completing the activities in TL102, doing assignments, preparing for the examination, and writing the examination. Students whose capabilities are below average must therefore spend more than 120 notional hours studying ECS2602 in order to be successful.

That boils down to 30 work days (4 hours per day) or 60 work days (at least 2 hours per day) that must be devoted to this module in order for the average student to pass it. This is the way in which each module is designed. In other words, you cannot plan your semester on the basis of completing assignments only.


## 2. THE IMPORTANCE OF THE WORKBOOK (TL102) AND TUTORIAL LETTER 103

It is very important that you work thoroughly through the study guide (MO001), all the activities in TL102 and TL103 (where you will find examples how to answer macroeconomic questions).

In TL102 there are many extra activities to help you to progress through the syllabus and to make sure that you understand the content. The solutions to the questions were also provided in TL102.

The activities will really help you to understand the theoretical building blocks of the different macroeconomic models (the goods market, the financial market, the IS-LM model in a closed and an open economy, the labour market as well as the AS-AD model). It is not sufficient preparation to work only through old examination papers without understanding the theoretical building blocks of the different macroeconomic models.

TL103 will help you to understand how to answer macro-economics questions, especially how to use chain of events in the different type of question asked.


## 3. STRUCTURE OF THE OCTOBER/NOVEMBER 2016 EXAMINATION PAPER

Please note that the structure of the examination paper for Oct/Nov 2016 has changed and is as follows:

It is a two-hour paper and consists of 2 sections (A and B) making up a total of 100 marks.

In **section A** you must answer all the questions. You will be asked to explain certain concepts and relationships, paragraphs and short essay type questions with explanations (with or without diagrams) which are based on the content of the whole module.

**The total number of marks for this section is 25 marks x 2 = 50 marks. It differs from the previous examination papers where section A counted 50 (50 x 1) marks**.

Make sure that you read through the questions carefully. If the question requires you to use a diagram, draw it neatly and large enough so that any descriptions are legible. Your explanation must then be based on the diagram. In the workbook you will find examples of essay-type questions which ask you to explain or compare something. When preparing for the examination keep in mind that the focus of the module is on the impact of fiscal and monetary policy on the level of output and income in the different models.

In other words, it will be expected of you to explain and compare the impact of fiscal and monetary policy on the level of output and income using the goods market model (fiscal policy only), financial market model (monetary policy only), the IS-LM model, the IS-LM model for an open economy and the AS-AD model.

Examples of these kinds of questions can be found in the study guide and the workbook (TL102).

**Section B** consists of 25 multiple-choice questions for 50 marks, based on the content of the whole module. Examples of multiple-choice questions appear throughout the workbook, the assignments and in previous examination papers. It differs from the previous examination papers where section B consisted of 20 multiple-choice questions for 50 marks.

4. **ANSWERS TO ASSIGNMENT 04**
   **(Unique number: 705374)**

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 | Option | Question | Option | Question | Option |
|----------|--------|----------|--------|----------|--------|
| 1 | 5 | 13 | 4 | 25 | 1 |
| 2 | 4 | 14 | 3 | 26 | 1 |
| 3 | 4 | 15 | 3 | 27 | 2 |
| 4 | 1 | 16 | 3 | 28 | 3 |
| 5 | 1 | 17 | 3 | 29 | 1 |
| 6 | 3 | 18 | 4 | 30 | 2 |
| 7 | 3 | 19 | 2 | 31 | 4 |
| 8 | 2 | 20 | 1 | 32 | 2 |
| 9 | 5 | 21 | 1 | 33 | No correct option |
| 10 | 3 | 22 | 5 | 34 | 4 |
| 11 | 4 | 23 | 4 | 35 | 2 |
| 12 | 2 | 24 | 1 |  |  |

1. The correct option is 5. Statements c, d and e are correct. See the study guide (MO001), learning unit 5. Statement a is incorrect. The nominal exchange rate is the price of domestic currency in terms of foreign currency. Statement b is incorrect. The real exchange rate is the relative price of domestic goods in terms of foreign goods.

2. The correct option is 4. See section 5.1 of the study guide. Note that there are two ways in which the nominal exchange rate can be defined: Price of foreign currency in terms of the domestic currency ($1 = R) – Direct method, for instance, $1 = R8.6734 and this is the common practice in South Africa. This is the rate you see on the television news, hear on the radio and read about in the newspapers. The other way is to express it as the price of the domestic currency in terms of foreign currency (e.g. R1 = $). This means that the price of the rand (the domestic currency) is expressed in terms of dollars, pounds, euros, and so forth – Indirect method, for instance, R1 = $0.20. In this module, we follow this international convention of defining the nominal exchange rate.

All the statements refer to the section regarding nominal exchange rates. Statement a is incorrect. This is an example of a depreciation in the nominal exchange rate because the rand (the domestic currency) is worth less in terms of dollars than before. Statement e is also incorrect and is an example of a depreciation of the rand because more rands are now needed to buy a dollar. Statements b, c and d are correct. These are examples of an appreciation in the nominal exchange rate.

3.    The correct option is 4. Statement d is correct. If the exchange rate between South Africa and the USA changes from R1 = $0.30 to R1 = $0.25, *ceteris paribus*, the rand depreciates and USA will import more from South Africa (or South Africa will export more to the USA). The rand is worth less in terms of dollars than before.

4.    The correct option is 1. Statement a is correct while statement b is incorrect. The nominal exchange rate is the price of the domestic currency in terms of foreign currency. Statement c is correct while statement d is incorrect. See the study guide, learning unit 5. A real appreciation means that South African goods are relatively more expensive than USA goods, given an unchanged nominal exchange rate. An increase in the real exchange rate therefore means that the relative price of SA goods compared with USA goods increases. SA goods are then relatively more expensive than USA goods (USA goods are relatively cheaper than before) and therefore exports will decrease. Statement e is incorrect. A real appreciation means that the relative price of South African goods (and not currency) compared with USA goods (and not currency) has increased.

5.    The correct option is 1. Only statements a and c are correct. Period 2000-2002 and period 2005-2008 represent a decline in the real exchange rate while period 2002-2005 and period 2008-2010 represents an increase in the real exchange rate.

6.    The correct option is 3. Only statements a, b and e are correct. The factors that will have an impact on the real exchange rate are the domestic price level (P), the foreign price level (P*) and the nominal exchange rate (E). See also the formula to calculate the real exchange rate:

$$\varepsilon = \frac{EP}{P*}$$

7.    The correct option is 3. A trade balance surplus indicates that a country earns more on exports than it spends on imports and this would be reflected as an improvement on the trade balance. If exports exceeded imports, the trade balance will improve.

8.    The correct option is 2. The formula to calculate the real exchange rate is:

$$\varepsilon = \frac{EP}{P*}$$

The calculation of the real exchange rate is as follows:

Real exchange rate for year 1:

$\varepsilon$   = (0.30 x 150) /120
      = 45/120
      = 0.375
      = 0.38

Real exchange rate for year 2:

$\varepsilon$ = (0.28 x 190)/130
= 53.2 /130
= 0.409
= 0.41

Therefore statements a, d and f are correct. Despite the decrease in the nominal exchange rate (from R1 = \$0.30 to R1 = \$0.28) the real exchange rate increases. This is due to the increase in the domestic price level relative to the increase in the foreign price level.

9. The correct option is 5. The interest parity condition tells the investor that when he/she has to decide between domestic or foreign financial investment he/she should consider the difference in the interest rate and the expected changes in the exchange rate.

10. The correct option is 3. 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 RSA bonds, it does not necessarily follow that RSA bonds are a better investment. The difference between the RSA interest rate and the USA interest rate is 3% (6% – 3%). Thus, if the expected depreciation of the rand is 4% financial market participants will buy USA bonds. Why? By holding RSA bonds, the investor will get higher interest payments for the year, but the rand will be worth less in terms of dollars at the end of the year, making investment in RSA bonds less attractive than investing in USA bonds.

11. The correct option is 4.

Statement a is incorrect while statement b is correct. The South African investor should buy USA bonds because they have a higher return.

*Return on South African bond:*
R100 000 (1 + 0.12) = R112 000.

*Return on USA bond:*
At an exchange rate of R1 = \$0.10 your investment in USA bonds, in dollars, is equal to R100 000 x \$0.10 = \$10 000. Your investment after one year, in dollars, is worth:
\$10 000 (1 + 2%) = \$10 000 (1 + 0.02) = \$10 200.

Converting \$10 200 back into rands at the expected exchange rate of R1 = \$0.09 gives you
\$10 200/0.09 = R113 333.

From the calculations it is clear that you should be buying USA bonds.

Compare statements c and d. Statement c is correct. The expected depreciation of the rand means that the USA bonds have an even higher return than at the original expected exchange rate.

Converting \$10 200 back into rands at the expected exchange rate of R1 = \$0.08 gives the investor
\$10 200/0.08 = R127 500.

12. The correct option is 2. Make sure you understand the difference between the demand for domestic goods and the domestic demand for goods. The demand for domestic goods (goods produced **in** South Africa) excludes imports and includes exports while the domestic demand for goods (goods consumed in South Africa – they can be produced **in South Africa or in any other country**) includes imports and excludes exports.

Statements a and b are correct. Foreign demand for domestic goods is also known as exports while domestic demand for foreign goods is also known as imports. Statement c is correct. The domestic demand for goods includes imports while exports form part of the demand for domestic goods.

Therefore, part of domestic demand falls on foreign/imported goods. Statement d is incorrect. The "domestic demand for goods" and the "demand for domestic goods" are not the same. See the explanation above. The "domestic demand for goods" includes imports and excludes exports while the "demand for domestic goods" excludes imports and includes exports.

13. The correct option is 4. Only statements b and d are correct. An increase in the real exchange rate implies that SA goods are relatively more expensive than the goods produced in the rest of the world and therefore exports will decrease.

14. The correct option is 3. This question refers to the determinants of imports and exports. Statement a is incorrect. A negative relationship exists between the real exchange rate and exports. Statement b is correct. A positive relationship exists between domestic level of output and imports. Statement c is correct. A positive relationship exists between the real exchange rate and imports. Statement d is incorrect while statement e is correct. The level of exports will not be determined by the domestic level output (Y), but by the level of output of a country's trading partners (Y*).

15. The correct option is 3. The NX curve represents the relationship between the level of output and income and the trade balance (i.e. the difference between exports and imports).

16. The correct option is 3. Diagram C represents the information given.

Given the information what you need to do is to calculate the net exports for each output and income level.
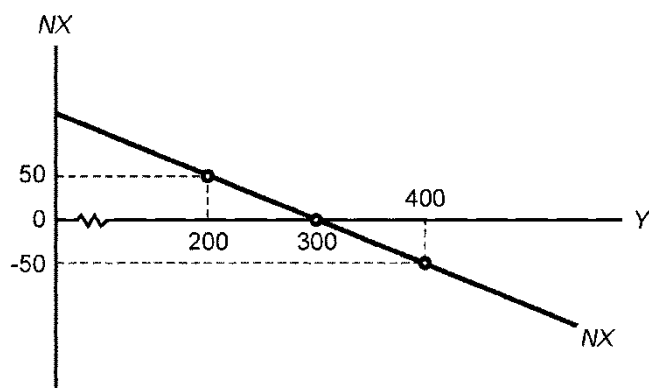
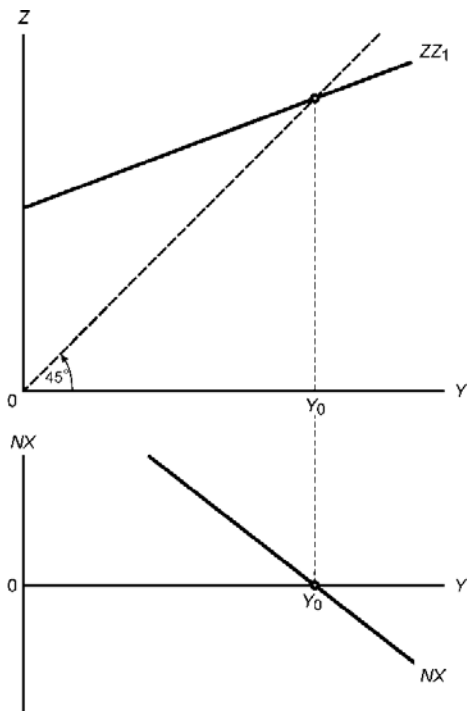Given that X = 100 then:
At Y = 200 is NX = X–IM = 100 – 50 = 50
At Y = 300 is NX = X–IM = 100 – 100 = 0
At Y = 400 is NX = X–IM = 100 – 150 = -50

You then use this information to draw the NX curve and it should look as follows:



17. The correct option is 3. If the original equilibrium level of output corresponds with a trade balance equilibrium position ($Y_{TB}$ or $Y_0$) the diagram will look as follows:

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Suppose the economy is in a recession, and the government decides to increase government spending in order to increase domestic demand and output. It means that the $ZZ_1$ curve will shift upwards and a downward movement along the NX curve takes place.

Therefore, the domestic level of output will increase and there will be a trade deficit (a downward movement along the NX curve).

The diagram will look as follows with trade balance equilibrium position $Y_{TB}$ or $Y_0$:
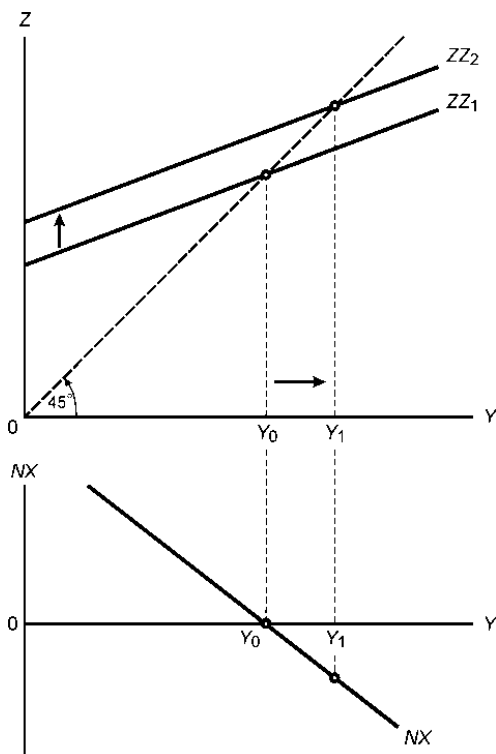
18. The correct option is 4. Statements b and e are correct. The factor that will shift the NX curve is a change in exports (in other words, a change in foreign demand). If the NX shifts to the left it means a decrease in exports or a decrease in foreign demand for domestic goods at each level of domestic output.

19. The correct option is 2. Diagram B is the correct diagram. If government spending increases the ZZ curve will shift upwards, the level of output and income will increase and the trade balance will lead to a trade deficit since the increase in income will lead to an increase in income will lead to an increase in imports and the increase in imports causes a trade deficit (see the explanation under answer 17).

20. The correct option is 1. Only statements a and b are correct. In terms of the model an increase in government spending increases the demand for goods and the demand for goods curve shifts upwards. This increased government spending has a multiplier impact on the level of output and income. Income increases and as income increases imports increase since there is a positive relationship between Y and IM. This increase in imports causes a trade deficit. This is indicated by a movement along the NX-curve indicating that as output and income increases the trade deficit increases.

21. The correct option is 1. To answer this question, you must understand the Marshall-Lerner condition (see section 6.4 of the study guide). A depreciation of the domestic currency decreases the price of exports and increases the price of imports and has therefore both a positive and a negative effect on the trade balance. *Positive effect*: the decrease in the price of exports results in an increase in exports and a decrease in imports and the trade balance improves. *Negative effect*: the increase in the price of imports increases the import bill which impacts negatively on the trade balance.

    The lower price of exports causes an increase in exports which, in turn, increases the demand for domestic goods as well as the level of output and income: $P_{exports}\downarrow \rightarrow X\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$

    The increase in the relative price of imports causes a switching of expenditure from foreign goods (which are now more expensive) to domestically produced goods. This results in a higher demand for domestic goods and a higher level of output and income: $P_{imports}\uparrow \rightarrow IM\downarrow \rightarrow Z\uparrow \rightarrow Y\uparrow$

    The higher level of income and output resulting from an increase in the demand for goods due to the depreciation will lead to an increase in imports: $Y\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$

    We assume the positive effects (increase in exports and decrease in imports due to the relative price changes) overwhelm the negative effects (the increase in the imports bill and the increase in imports due to an increase in the level of output and income) and the trade balance improves overall.

    $X\uparrow$ and $IM\downarrow \rightarrow$ NX improves

    Thus, for the Marshall-Lerner condition to hold, depreciation must eventually lead to an increase in net exports and for this to happens, the positive effect on the trade balance must outstrip the negative effect. Therefore, the $ZZ_1$ curve will shift upwards, the domestic level of output will increase, the NX curve will shift to the right and a trade surplus occurs.
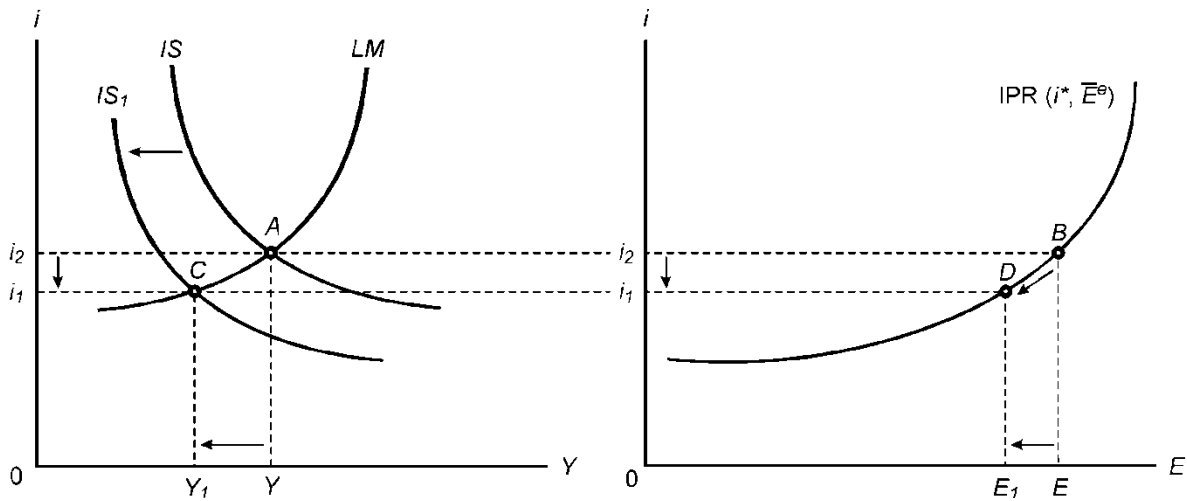
    The diagram will look as follows in the case of a depreciation of the domestic currency:
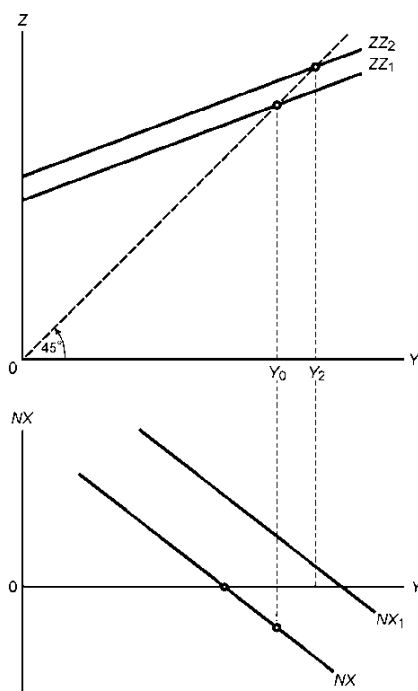
Therefore the $ZZ_1$ curve will shift upwards.

22. The correct option is 5. Remember we assume the Marshall-Lerner condition when working with depreciation and the trade balance (see the explanation under answer 21). Given that the Marshall-Lerner condition holds, a depreciation results in an improvement in the trade balance and the level of output and income. Therefore the domestic level of output will increase and there will be a lower trade deficit or improvement in the trade balance.

23. The correct option is 4. Statement a is correct. The equilibrium condition in the financial market is $M^d = M^s$. Statement b is correct. Financial investors, domestic or foreign, go for the highest expected rate of return. Statement c is incorrect. To derive a relationship between the domestic interest rate and the nominal exchange rate the interest parity equation is used by assuming that the expected exchange rate is **unchanged**. Note: The interest parity relations shows (given $i^*$, $\bar{E}^e$) the following relationship: $i\uparrow \rightarrow E\uparrow$ and $i\downarrow \rightarrow E\downarrow$. Statement d is correct. A positive relationship occurs between the domestic interest rate and the nominal exchange rate. The reasoning behind this is as follows: say for instance the domestic interest rate increases relative to that of the rest of the world. Because of the increase in the interest rate the attractiveness of our bonds is better since the rate of return offered on our bonds is higher than bonds offered in the rest of the world. On the balance of payments side, a capital inflow occurs and we experience a higher demand for rand on the foreign exchange market. This increase in the demand for rand results in an appreciation of the rand (the opposite is also true).

24. The correct option is 1. The only **incorrect** statement regarding the IS and LM relations in an open economy is statement 1. A positive relationship occurs between the domestic interest rate and the nominal exchange rate. See the explanation under statement d, answer 23 above. An increase in the interest rate will increase the exchange rate ($i\uparrow \rightarrow E\uparrow$ and $i\downarrow \rightarrow E\downarrow$ because they are positively related). Statements 2 to 5 are all correct. The chain of events for statement 4 will look as follows: $Y\uparrow \rightarrow M^d\uparrow \rightarrow i\uparrow$.

25. The correct option is 1. Statements a, b and d are correct. Statement a is correct. A decrease in government spending is part of contractionary fiscal policy and will shift the IS curve. Statement b is correct. Monetary policy refers to changes in the money supply and will shift the LM curve. Statement c is incorrect. A decrease in government spending will shift the IS curve to the left. Statement d is correct. An increase in taxation, in other words a contractionary fiscal policy will shift the IS curve to the left. Statement e is incorrect. A change in the interest rate will cause a movement along the LM curve and not a shift of the curve.
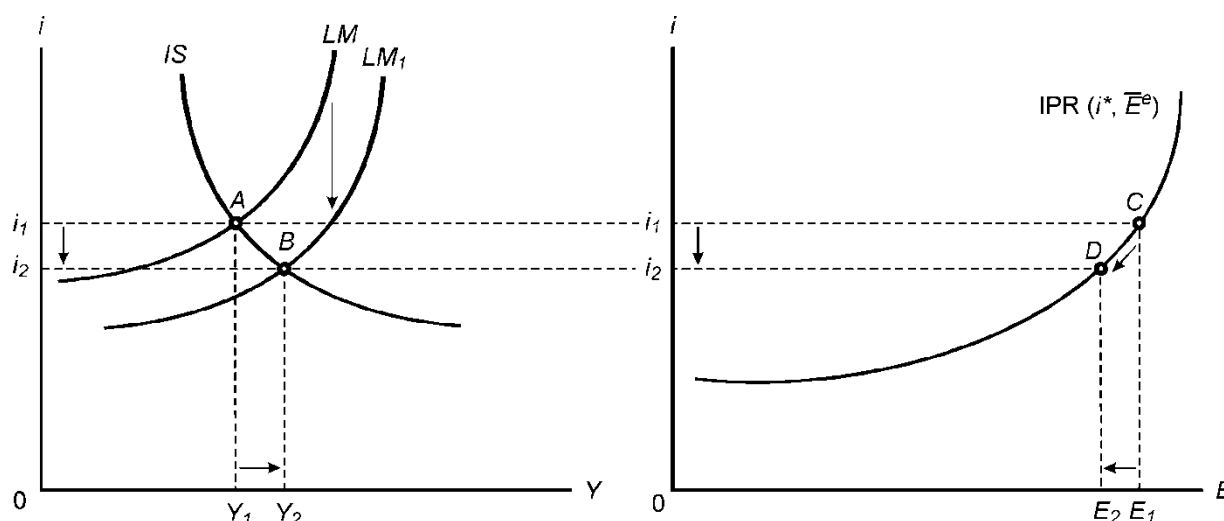
26. The correct option is 1. A decrease in government spending refers to a contractionary fiscal policy. The IS curve will shift to the left that will cause a decrease in the demand for goods and the level of output; a decrease in the demand for money and the interest rate; a depreciation of the domestic currency and the trade balance improves as exports increase. The diagram will look as follows:



The chain of events will look as follows:

| Contractionary fiscal 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** |
| $Y\downarrow \rightarrow M^d\downarrow \rightarrow i\downarrow$ |
| |
| **Back to the goods market** |
| $i\downarrow \rightarrow I\uparrow$ |
| $Y\downarrow \rightarrow I\downarrow$ |
| **Impact on the exchange rate and trade balance** |
| $i\downarrow \rightarrow E\downarrow \rightarrow X\uparrow \rightarrow NX\uparrow$ |
| $E\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$ |
| $Y\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$ |

27. The correct option is 2. An increase in the money supply, in other words an expansionary monetary policy will shift the LM curve downwards that will cause a lower interest rate, a capital outflow, a depreciation of the exchange rate and an improvement of the trade balance. The diagram will look as follows:

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The chain of events will look as follows:

| Contractionary monetary policy |
| --- |
| **Impact is first on the financial market** <br> $M\uparrow \rightarrow M/P\uparrow \rightarrow i\downarrow$ <br><br> **Then the impact on the goods market** <br> $i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$ <br> $Y\uparrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$ |
| **Impact on the exchange rate and trade balance** <br> $i\downarrow \rightarrow E\downarrow \rightarrow X\uparrow \rightarrow NX\uparrow$ <br> $E\downarrow \rightarrow IM\downarrow \rightarrow NX\uparrow$ <br> $Y\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$ (this effect is overwhelmed and a depreciation results in an improvement of the trade balance) |

28. The correct option is 3. Statements a and c are correct. The diagram will look the same as answer 26. In the IS-LM model for an open economy fiscal contraction (e.g. a decrease in government spending) implies that the IS curve will shift to the left and the interest rate decreases. The decrease in the interest rate relative to the interest rate in the rest of the world causes a capital outflow, the demand for the domestic currency decreases, the nominal exchange rate decreases and a depreciation of the domestic currency takes place.

29. The correct option is 1. Only statements a and c are correct. See the figure in TL101 labelled "South Africa Balance of Trade". As at July 2011 and as at January 2012 South Africa experienced a trade surplus since exports exceeded imports.

30. The correct option is 2. **For the period** July 2011 to January 2012 the R/$ exchange rate depreciated (note that the exchange rate is quoted using the indirect method, i.e. $1 = R8). Over the period beginning July 2011 and ending January 2012 South African exports experienced an overall increase. See the figure in TL101 labelled "South African Exports".

31. The correct option is 4. In the IS-LM model for an open economy the impact of the relatively higher interest rate on the R/$ exchange rate and the trade balance will be as follows: It caused an appreciation of the R/$ exchange rate (because of the increase in our domestic interest rate relative to that of the rest of the world it increases the attractiveness of our bonds since the rate of return offered on our bonds is now higher than that offered in the rest of the world. On the balance of payments side, a capital inflow occurs and we experience a higher demand for rands on the foreign

exchange market and this increase in the demand for rands results in an appreciation of the domestic currency), exports decreased and the deficit on the trade balance increased.

32. The correct option is 2. The impact of an increase in government spending (or expansionary fiscal policy) on the exchange rate and the trade balance can be represented by the following chain of events: $G\uparrow$: $i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$.
The increase in the interest rate is because $Y\uparrow \rightarrow M^d\uparrow \rightarrow i\uparrow$.

The full chain of events will look as follows:

| **Expansionary fiscal policy** |
|---|
| **Impact is first on the goods market** <br> $\quad G\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$ <br> $\quad Y\uparrow \rightarrow C\uparrow$ <br> $\quad Y\uparrow \rightarrow I\uparrow$ <br> **Then the impact on the financial market** <br> $\quad Y\uparrow \rightarrow M^d\uparrow \rightarrow i\uparrow$ |
| **Back to the goods market** <br> $\quad i\uparrow \rightarrow I\downarrow$ <br> $\quad Y\uparrow \rightarrow I\uparrow$ |
| **Impact on the exchange rate and trade balance** <br> $\quad i\uparrow \rightarrow Capital_{inflow} \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$ <br> $\quad E\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$ <br> $\quad Y\uparrow \rightarrow IM\uparrow \rightarrow NX\downarrow$ |

Compare statement 1 and 2. Therefore statement 1 is incorrect and statement 2 correct. Statements 3 and 4 are incorrect because the interest rate will increase if government spending increases.

33. There is no correct option. The question was not marked.
The impact of contractionary monetary policy on the exchange rate and the trade balance can be represented by the following chain of events:
$M\downarrow$: $i\uparrow \rightarrow E\uparrow \rightarrow X\downarrow \rightarrow NX\downarrow$
The interest rate will increase since $M\downarrow \rightarrow M/P\downarrow \rightarrow i\uparrow$

Questions 34 and 35 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:

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| Contractionary fiscal policy | Contractionary monetary policy |
|---|---|
| **Impact is first on the goods market**<br>$\quad$ G↓ → Z↓ → Y↓<br>$\quad$ Y↓ → C↓<br>$\quad$ Y↓ → I↓<br>**Then the impact on the financial market**<br>$\quad$ Y↓ → M$^d$↓ → i↓ | **Impact is first on the financial market**<br>$\quad$ M↓ → M/P↓ → i↑<br><br>**Then the impact on the goods market**<br>$\quad$ i↑ → I↓ → Z↓ → Y↓<br>$\quad$ Y↓ → I↓ → Z↓ → Y↓ |
| **Back to the goods market**<br>$\quad$ i↓ → I↑<br>$\quad$ Y↓ → I↓ | **Impact on the exchange rate and trade balance**<br>$\quad$ i↑ → E↑→ X↓ → NX↓ |
| **Impact on the exchange rate and trade balance**<br>$\quad$ i↓ → E↓ → X↑ → NX↑<br>$\quad$ E↓ → IM↓ → NX↑<br>$\quad$ Y↓ → IM↓ → NX↑ | |

34. The correct option is 4. The reason for the depreciation of the exchange rate due to a contractionary fiscal policy is because of the decrease in the domestic interest rate relative to the world interest rate while due to 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.

35. The correct option is 2. The reason for the capital outflow due to a contractionary fiscal policy is because of the decrease in the interest rate while contractionary monetary policy will lead to a capital inflow because of the increase in the interest rate.

## 5. 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 | Option | Question | Option | Question | Option |
|---|---|---|---|---|---|
| 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:
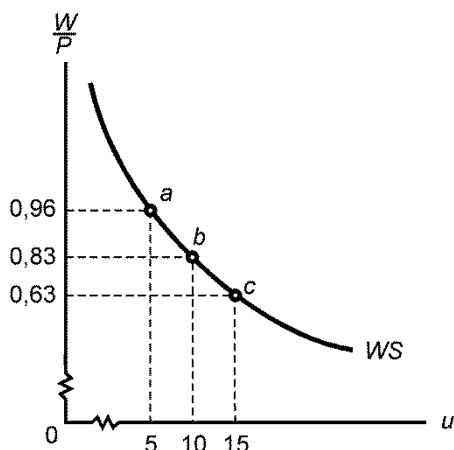


	Statements b and d are also correct. See section 8.1 in the study guide.

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:

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

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:

14

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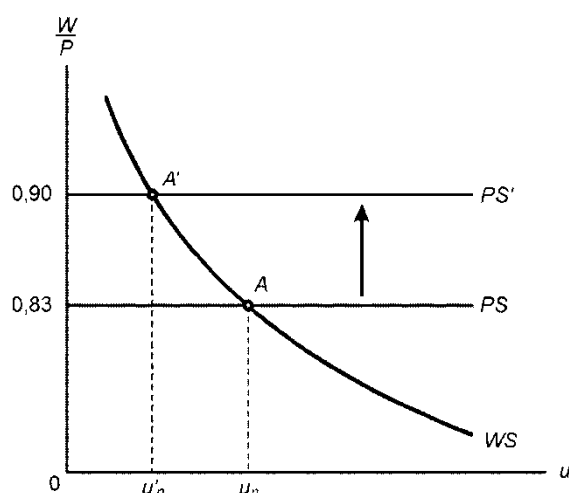
Statement d is correct. For example: W/P = 1/1 + m
Say the mark-up = 20%, thus 1/1+ 20% = 1/1.2 = 0.83
The mark-up decreases now to 10%, thus 1/1+ 10% = 1/1.1 = 0.90
The PS curve therefore will shift upwards if the mark-up by firms decreases.

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^eF(u,z)
      +    −,+

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

15

Statements c and d are based on the following equation:

$$P = (1 + m)W$$
$$\phantom{P = (1 +} + \;\; +$$

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 to the right while a factor that hampers/worsens the bargaining position will shift the WS curve to the left. 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 to the left. Statement e is incorrect. Better unemployment benefits will shift the WS curve to the right.

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).
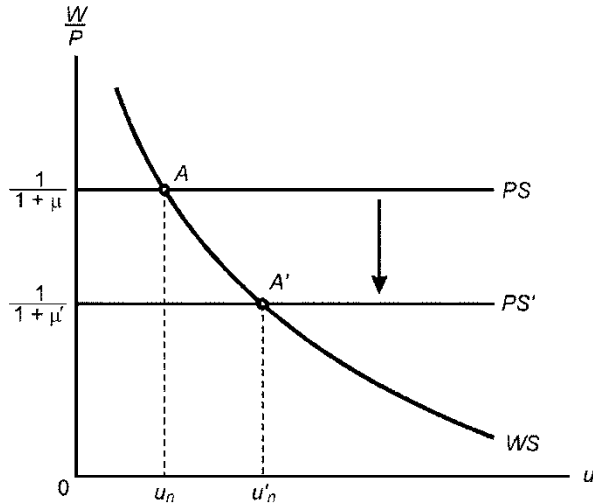


    Statement b is incorrect since a lower mark-up will shift the PS curve upwards. Statement d is incorrect. An increase in the workers' bargaining position will shift the WS curve and not the PS curve.

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.

16

Statement c is correct. The targeted real wage is lower than the implied real wage. Statement d is therefore incorrect.
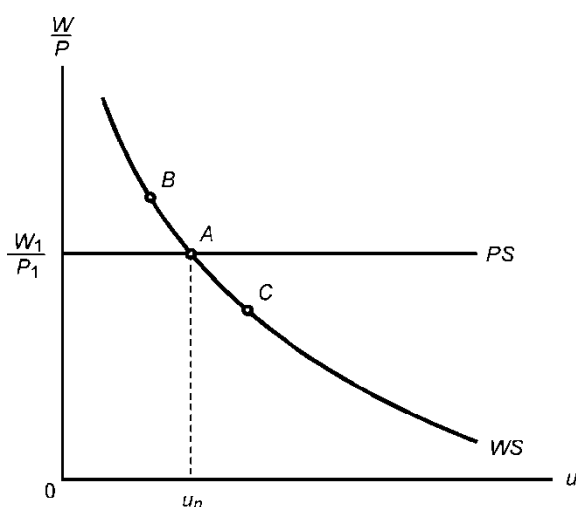


16. The correct option is 2. A decrease in the level of output (Y) will cause the level of unemployment to increases (because Y decreases, N will decrease and u will increase) which causes a decline in the bargaining position of workers resulting in a lower bargained nominal wage: $Y\downarrow \rightarrow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

17. The correct option is 3. The chain of events that describes the impact of an increase in output on the labour market is: $Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow W\uparrow$. 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:
$Y\downarrow \rightarrow N\downarrow \rightarrow u\uparrow \rightarrow W\downarrow \rightarrow P\downarrow$
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:
$Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow W\uparrow \rightarrow P\uparrow$. 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 $P_2 = P^e$.
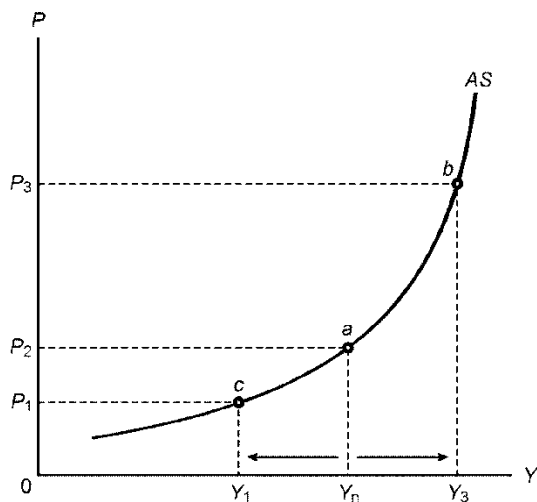
Questions 21 and 22 are based on the following AS curve:
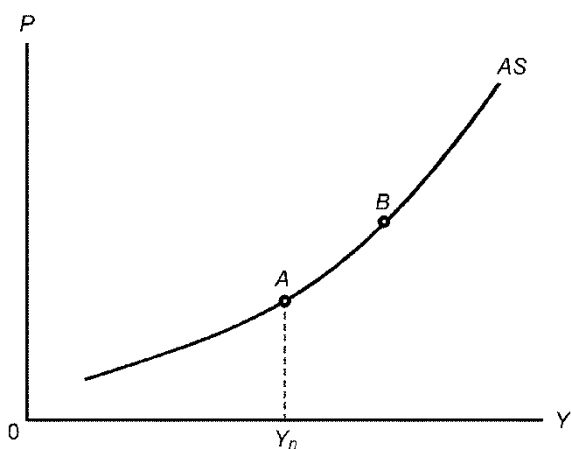


21. The correct option is 1. As already indicated in question 20, an important property of the AS curve is that a given AS curve passes through a point where the level of output is equal to the natural level of output ($Y = Y_n$) and the actual price level = the expected price level ($P = P^e$). Therefore 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.
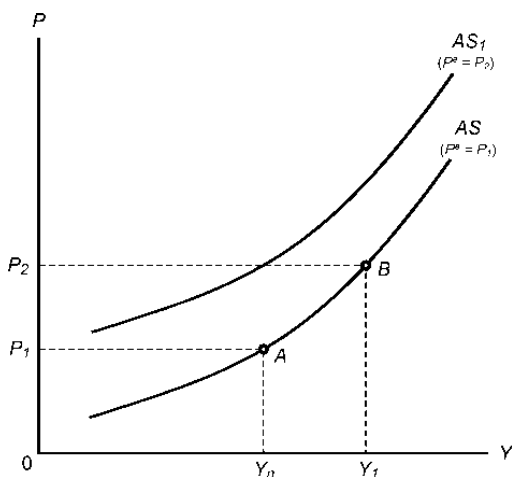
23. The correct option is 1. See section 9.1 of the study guide for the factors that will shift the AS curve versus the factors that will cause a movement along the AS curve. It is only an increase in the expected price level that will cause an upwards shift of the AS curve.

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.
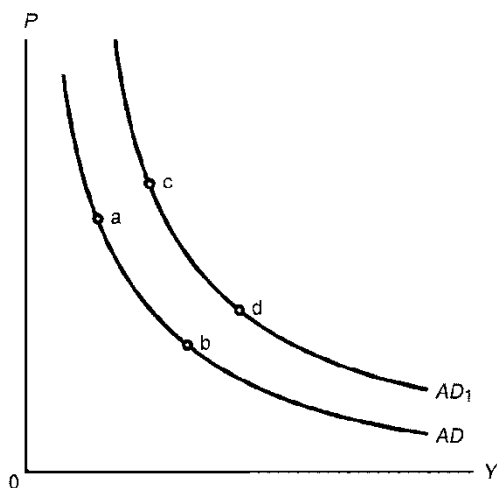


To answer this question you must use the following chain of events since when comparing point a with point b on curve AD in the diagram above there was a decrease in the price level:
$P\downarrow \rightarrow M/P\uparrow \rightarrow i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$

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, $M\uparrow$. 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. | $P^e < P$: $W\uparrow \rightarrow P\uparrow$ | $M/P\downarrow \rightarrow i\uparrow$ | $I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$ |

> **Note:** We refer to the neutrality of money in the medium run following the prescribed books explanation. Note that many economists refer to the neutrality of money in the long run not the medium run. The distinction between the medium run and long run in the AS-AD model falls outside the prescribed material for this module.

30. The correct option is 2. The question refers to the events in the **medium (to long) 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:  $Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow W\uparrow \rightarrow P\uparrow$

20

But the question refers to the **medium (to long)** 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 (to long)** 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 (to long)** 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.
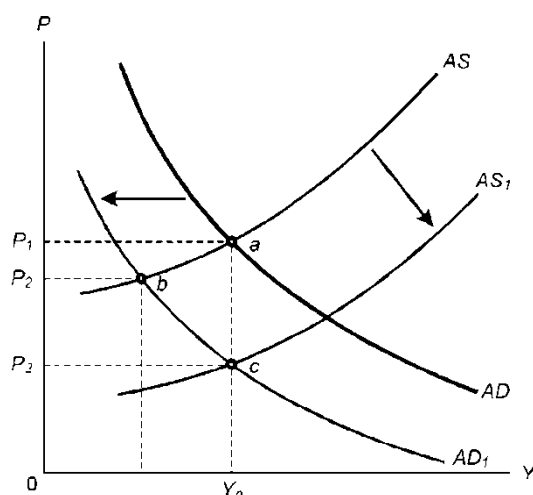


Statement a is incorrect since in the short run the interest rate will decrease in the financial market. The complete chain of events will be as follows:

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

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

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**.

SOUTH AFRICA GOVERNMENT SPENDING



SOURCE: WWW.TRADINGECONOMICS.COM | SOUTH AFRICAN RESERVE BANK

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 $AD_1$. |

## Events in the labour market

As the level of output increases, the level of employment increases and the unemployment rate decreases. The decrease in the unemployment rate increases the bargaining position of workers and the nominal wage increases. An increase in the nominal wage in turn causes an increase in the price level.

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

---

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.

---

## 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 point 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**.
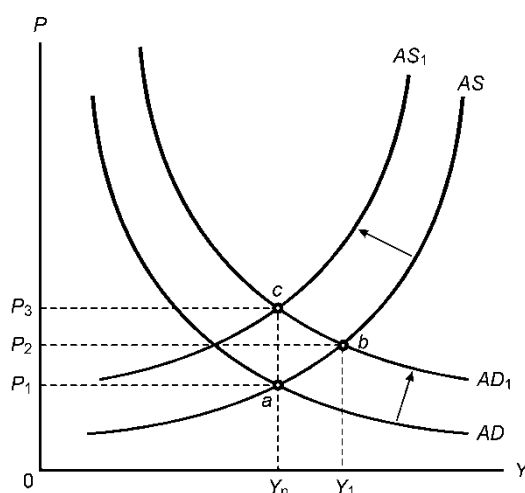
**Question 2**

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.**
>
> 
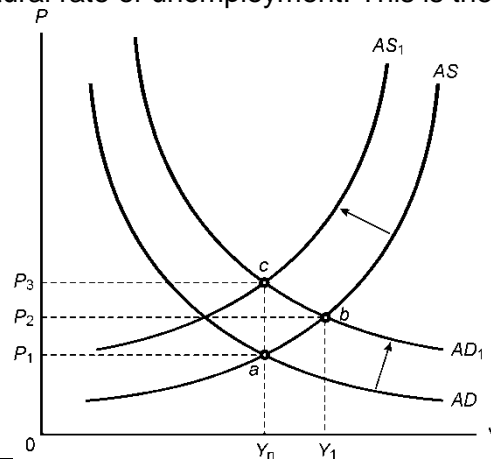
## Question 3

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 |
|---|---|
| $M^s\uparrow \rightarrow M/P\uparrow \rightarrow i\downarrow$ | $P^e\uparrow \rightarrow W\uparrow \rightarrow \textbf{P}\uparrow$ |
| $i\downarrow \rightarrow I\uparrow \rightarrow Z\uparrow \rightarrow Y\uparrow$ | $\textbf{P}\uparrow \rightarrow M/P\downarrow \rightarrow i\uparrow \rightarrow I\downarrow \rightarrow Z\downarrow \rightarrow Y\downarrow$ |
| $Y\uparrow \rightarrow N\uparrow \rightarrow u\downarrow \rightarrow \textbf{W}\uparrow \rightarrow \textbf{P}\uparrow$ | |

**The nominal variables increase in the medium run**

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

**The real variables** all remain **unchanged in the medium run**

- 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.

## 6. 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 TL103 and all the activities in TL102 (Workbook).

We wish you success in your studies!

Your lecturers

| Name of lecturer | Email address | Telephone number (Inside SA) | Telephone number (Outside SA) |
|---|---|---|---|
| Mrs T Uys | uysmd@unisa.ac.za | 012 433 4702 | +27 12433 4702 |
| Mrs S Kennedy-Palmer | kennes@unisa.ac.za | 012 433 4666 | +27 12433 4666 |