

Markscheme

May 2016

Economics

Higher level


Paper 3

17 pages

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Notes for examiners:

1. Whenever relevant, carry over marks must be awarded. If a candidate makes an error in calculation, but then uses the incorrect figure appropriately and accurately in later question parts, then the candidate may be fully rewarded. This is the “own-figure rule” and you should put OFR on the script where you are rewarding this. To do this you will need to use the on-page comment annotation tool ().
2. Alternative approaches may be taken in responses to the [4] questions that use A02 command terms. If this is the case and the alternative approaches are valid, then full credit should be given.

1. (a) Calculate the quantity of butter demanded per year when price per kg is:
 - (i) \$7; [1]

$$Q_d = 420 - 7 \times 19 =$$

$$287 \text{ million kg} \quad [1]$$

An answer of 287 million (without workings, kg) is sufficient for [1].
 - (ii) \$10. [1]

$$Q_d = 420 - 10 \times 19 =$$

$$230 \text{ million Kg} \quad [1]$$

An answer of 230 million kg (without workings, kg) is sufficient for [1].
- (b) (i) Calculate the price elasticity of demand when price increases from \$7 to \$10. [2]

$$PED = \frac{\% \Delta Q_d}{\% \Delta P} = \frac{-19.86}{42.86} \quad [1]$$

Any valid working is sufficient for [1].

$$PED = -0.46 \quad [1]$$

An answer of 0.46 (without workings) is sufficient for [1].

OFR applies if quantities in part (a) have been calculated incorrectly.

Correct use of the midpoint formula should be accepted.
PED = 0.62 (or 0.61 or 0.63 – depending on the method of rounding during the calculation).

(ii) Explain why, for a linear demand curve, the price elasticity of demand is not represented by the slope of the **demand curve**. [4]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>The written response is limited.</i> For explaining that the gradient of a linear demand curve is constant along the curve, but PED changes, and that demand is more elastic at higher prices.	1–2
2 <i>The written response is accurate.</i> For explaining that the gradient of a linear demand curve is constant along the curve. However, the rates of change of price and quantity are not constant. As price increases, the % change in price diminishes while the % change in quantity demanded increases. Therefore, the slope, which is constant, cannot represent the formula	3–4

$$PED = \frac{\% \Delta Q_d}{\% \Delta P}$$

OR

an explanation that $PED = \text{slope} \times \frac{P}{Q}$

Since the slope $\frac{\Delta Q}{\Delta P}$ is constant along a straight line, PED is equal to a

constant number $\times \frac{P}{Q}$ whose value constantly changes along the demand curve. Therefore, as we move along the demand curve, PED changes.

A response which uses $\frac{dQ}{dP}$ in this explanation should be rewarded.

A response which explains that, as price increases, the price becomes a larger portion of income, hence the consumer becomes more responsive to changes in price, should be awarded a maximum of [3].

(c) (i) If fixed costs are \$800 000 per month, calculate the total variable costs at a monthly output of 140 000 units. [2]

At 140000 units per month, $TC = 140000 \times ATC = 140000 \times \18
 $= 2520000$ [1]

$VC = TC - FC = 2520000 - 800000$
 $= \$1720000$ [1]

Any valid working is sufficient for [1].

An answer of \$1 720 000 or \$1.72 million (without workings) is sufficient for [1].

(iii) Outline the difference between the explicit and implicit costs of production. [2]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>Vague understanding.</i> The idea that some costs require actual payments, while others do not.	1
2 <i>Clear understanding.</i> Explicit costs involve a payment, while implicit costs involve the sacrifice of income (or, do not involve payment) arising from the use of a resource owned by the firm.	2

If candidates express a clear understanding with the use of appropriate examples, then full marks may be awarded. Furthermore, a candidate who explains the difference clearly, but mixes up the terms, may be awarded [1].

*A response which explains **either** explicit **or** implicit costs correctly may be awarded [1].*

(iv)	Define the term normal profit.	[2]
	Level	Marks
	0 <i>The work does not reach a standard described by the descriptors below.</i>	0
	1 <i>Vague definition.</i> The idea that it is just enough profit. OR A response which describes the condition for normal profit, such as the one below, may be awarded [1] : An explanation that it is the revenue which is just sufficient to cover all production costs, explicit plus implicit (TR=TC).	1
	2 <i>Accurate definition.</i> A response which indicates one of the following: <ul style="list-style-type: none"> • an explanation that it is the level of profit which is just sufficient to keep a firm in business • an explanation that it is sufficient (accounting) profit to cover implicit costs • the return which could have been earned from the next best alternative. 	2
(d)	(i) Calculate the economic profit made by the cartel if the members jointly supply 50 000 units per month.	[2]
	Profit = Q(AR – ATC) = 50 000 (16 – 12)	[1]
	= \$200 000	[1]
	<i>Any valid working is sufficient for [1]. An answer of \$200 000 (without workings) is sufficient for [1].</i>	
	(ii) Identify the level of output which would maximize revenue for the cartel.	[1]
	90 000 units per month	[1]
	<i>An answer of 90 000 is sufficient for [1].</i>	
	(iii) Calculate the value of total revenue per month for members of the cartel if they produce at the revenue maximizing level of output.	[2]
	90 000 × \$11 = \$990 000	[1]
		[1]
	<i>Any valid working is sufficient for [1]. An answer of \$990 000 (without workings) is sufficient for [1].</i>	
	<i>OFR applies if the answer to part (ii) is incorrect</i>	

- (e) Outline the reason why, even if a cartel achieves its objective of jointly maximizing profit, there will be an incentive for members of the cartel to cheat. **[2]**

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>Vague understanding.</i> The idea that an individual firm will benefit from “cheating”.	1
2 <i>Clear understanding.</i> A brief explanation that if a cartel member sells at a lower price than the cartel price or a greater quantity than the agreed quota, the firm will benefit from an increase in sales/market share/profit. A response which refers to game theory, such that a firm might believe the other cartel members will not cheat and so will benefit from cheating, may be fully rewarded.	2

- (f) Explain **two** conditions, apart from the incentive for members to cheat, which make cartel structures difficult to maintain. [4]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>The written response is limited.</i>	1–2
For providing one condition without explanation [1] . For providing two conditions without explanation or for providing one condition with explanation [2] .	
2 <i>The written response is accurate.</i>	3–4
For providing one condition without explanation and one condition with explanation [3] . For providing two conditions with explanation [4] .	

Conditions **may** include:

- cost differences between firms – it is likely that firms in the cartel will have different cost curves/produce differentiated products. As a result, it will be difficult for the cartel to come to a common agreement on price and output
- number of firms in the cartel agreement – the larger the number of firms, the more likely it is that one of them will cheat, and the more difficult to come to an agreement on common prices
- the market share enjoyed by the cartel. The smaller the market share, the greater the incentive to leave as the benefits of membership might not be significant (or, the greater the probability that non-members will undercut them)
- the priority to survive during a recession – during difficult economic times, firms will be more likely to lower prices and cheat, possibly leading to the breakdown of the cartel. Any appropriate explanation of firms with differing/changing objectives may be rewarded
- potential entry into the market – supernormal profits will attract new firms into the industry. If the barriers to entry can be overcome, the introduction of new firms may weaken the cartel and lead to price competition
- the lack of a dominant firm – often, a cartel is led by the dominant producer. If no such dominant firm exists, it may be difficult to maintain agreements.
- the objectives of firms in the cartel may have changed, making it difficult for cartel members to reach agreement on future output/price.

NB a response which explains that objectives may be different (without reference to the idea that the objectives have changed) may be awarded **[1]**.

NB an explanation that the cartel structure may be difficult to maintain because, in many countries, cartels are illegal, may be awarded **[1]**.

2. (a) Define the term freely floating exchange rate system. [2]
- | Level | Marks |
|---|----------|
| 0 <i>The work does not reach a standard described by the descriptors below.</i> | 0 |
| 1 <i>Vague definition.</i>
The idea that the exchange rate fluctuates / changes. | 1 |
| 2 <i>Accurate definition.</i>
An explanation that the determination of the exchange rate depends on market forces (D and S). | 2 |
- (b) Calculate the equilibrium exchange rate for the Botswana pula (BWP). [2]
- $$4611 - 100P = 4578 + 200P$$
- $$33 = 300P$$
- [1]
- Any valid working is worth [1]*
- $$P = \text{US\$}0.11$$
- [1]
- An answer of US\$0.11 or 11 cents without working is sufficient for [1] only.*
- (c) Following a rise in domestic interest rates in Botswana, the value of the BWP rises to US\$0.14.
- (i) State the term used to describe the change in Botswana’s exchange rate. [1]
- The Botswana pula has appreciated. [1]
- (ii) Outline **one** reason why the increase in domestic interest rates in Botswana may have caused the value of the BWP to increase. [2]
- | Level | Marks |
|---|----------|
| 0 <i>The work does not reach a standard described by the descriptors below.</i> | 0 |
| 1 <i>Vague answer.</i>
The idea that demand for the BWP increased or supply of the BWP decreased. | 1 |
| 2 <i>Accurate answer.</i>
An explanation that the increase in interest rates leads to an inflow of financial investment funds, which caused the demand for the BWP to increase or, that increase in interest rates leads to a smaller outflow of financial investment funds, which caused the supply of the BWP to decrease. | 2 |
- NB** *The term “financial investment funds” is not necessary – any appropriate term which implies that higher interest rates will attract funds into Botswana is acceptable.*

(iii)	State the term that would describe the change if the BWP was determined in a fixed exchange rate system.	[1]
	Revaluation	[1]
(d)	(i) Define the term income elastic.	[2]
	Level	Marks
	0 <i>The work does not reach a standard described by the descriptors below.</i>	0
	1 <i>Vague definition.</i> The idea that if income increases, demand increases by more/a large quantity (or, only, that $YED > 1$).	1
	2 <i>Accurate definition.</i> Demand is income elastic if a change in income leads to a proportionately greater change in quantity demanded.	2
(ii)	Explain, using an appropriate diagram, how faster economic growth in the US and the European Union (EU) may affect the value of the BWP.	[4]
	Level	Marks
	0 <i>The work does not reach a standard described by the descriptors below.</i>	0
	1 <i>The written response is limited.</i> For explaining that faster US and EU growth means that incomes are rising in these economies and thus they will absorb more diamond imports from Botswana, which shifts the demand for the BWP to the right and leads to an appreciation of the BWP or for drawing a fully labelled diagram showing a shift to the right of the demand for the BWP as a result of increased exports of diamonds and an appreciation of the BWP.	1–2
	2 <i>The written response is accurate.</i> For explaining that faster US and EU growth means that incomes are rising in these economies and thus they will absorb more diamond imports from Botswana, which shifts the demand for the BWP to the right and leads to an appreciation of the BWP and for drawing a fully labelled diagram showing a shift to the right of the demand for the BWP as a result of increased exports of diamonds and an appreciation of the BWP.	3–4

Candidates who incorrectly label diagrams can be rewarded with a maximum of [3].

For an exchange rate diagram, the vertical axis may be labelled exchange rate, price of BWP or other currency per BWP. The horizontal axis may be labelled BWP, quantity or quantity of BWP. A title is not necessary.

- (e) (i) State the formula used to measure the terms of trade. [1]

$$\text{TOT} = \frac{\text{index of average price of exports}}{\text{index of average price of imports}} \times 100$$

[1]

Candidates may omit “index” or “average” but not both.

- (ii) Outline the meaning of the “terms of trade”. [2]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>Vague answer.</i> The TOT measures the rate at which products are exchanged.	1
2 <i>Accurate answer.</i> The TOT show the volume of imports attainable by a country by a unit (quantity) of its exports OR the rate at which exports of a country are exchanged for imports.	2

NB a response which merely rephrases the formula should be assessed at level 0.

- (f) (i) Calculate the percentage change in Botswana’s terms of trade between 2007 and 2008 **and** between 2008 and 2010. [2]

$$2007 \rightarrow 2008 : \frac{(80.57 - 98.61)}{98.61} = -18.29\% \text{ (decrease by 18.29\%)}$$

[1]

An answer of -18.29 is sufficient for [1]

$$2008 \rightarrow 2010 : \frac{(84.57 - 80.57)}{80.57} = 4.96\%$$

[1]

An answer of 4.96 is sufficient for [1]

- (ii) Using appropriate terms, describe the changes in Botswana’s terms of trade between 2007 and 2008 **and** between 2008 and 2010. [2]

2007 → 2008 TOT deteriorated; worsened; unfavourable movement [1]

2008 → 2010 TOT improved; favourable movement [1]

OFR applies

NB a response which uses incorrect terms (eg increase/decrease, or rise and fall) but which demonstrates understanding via a description, may be awarded [1].

- (g) Assume now that Botswana's currency depreciates. Explain how this may impact on the country's current account balance. **[4]**

Level Marks

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1-2**

For explaining that a depreciation causes the (relative) price of exports to fall and the (relative) price of imports to rise, so exports will increase and/or imports will decrease, leading to an improvement in the current account balance.

2 *The written response is accurate.* **3-4**

For explaining that a depreciation causes the (relative) price of exports to fall and the (relative) price of imports to rise, so the response of the volume of exports and imports is crucial and for explaining that the current account balance will improve if the M-L condition is satisfied, namely that $ped_x + ped_m > 1$. (Or an explanation which refers to the demand for exports and imports being elastic, so that a depreciation would cause the value of exports to increase and the value of imports to fall.)

3. (a) Calculate the consumer price index (CPI) for Country A in 2016. **[3]**

In 2015, the typical basket costs

$$5.6 \times 25 + 3.45 \times 18 + 1.2 \times 40 + 8.40 \times 5 + 2.55 \times 12 = 322.70$$
[1]

In 2016, the typical basket costs

$$6.3 \times 25 + 3.5 \times 18 + 1.05 \times 40 + 9.20 \times 5 + 2.35 \times 12 = 336.70$$
[1]

Any valid working is sufficient for [1].

$$\text{The CPI in 2016} = \frac{336.70}{322.70} \times 100$$

$$= 104.34$$
[1]

An answer of 104.34 without workings is sufficient for [1].

OFR applies, assuming that the correct method of calculating the cost of the baskets is applied.

- (b) State **two** reasons why the CPI may not accurately reflect changes in the cost of living for citizens of Country A. [2]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>Vague answer.</i> One reason is stated.	1
2 <i>Accurate answer.</i> Two reasons are stated. Reasons may include: <ul style="list-style-type: none"> • different income earners may experience consumption patterns • consumption patterns change frequently • there may be wide regional differences in prices • any other valid response. 	2

NB Candidates may use terms such as “substitution bias”, “outlet bias” and “quality bias” but such terms are not necessary to earn full marks.

- (c) (i) Using the data in **Table 2** to support your answer, identify **one** year in which Country B experienced deflation **and one** year in which Country B experienced disinflation. [2]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 One year is identified accurately, with supporting evidence.	1
2 Two years are identified accurately, with supporting evidence (for at least one of the two periods).	2

Country B experienced deflation between 2008 and 2009. This is evidenced by the decrease in the CPI (from 98 to 97, indicating a negative rate of inflation). Disinflation was experienced between 2011 and 2012, as the rate of increase in the CPI (4.55%) was lower than in the previous year (10%). (Note: actual inflation rates are not required as long as there is some reference to the idea that the index number fell (2009) and increased at a slower rate (2012))

Candidates may state the year rather than the initial and final years ie 2009 rather than 2008–09.

- (ii) In Country B, nominal per capita GDP is \$800 per month in 2010 and \$940 per month in 2012. Using the CPI in **Table 2** as a deflator, calculate the percentage change in real per capita GDP from 2010 to 2012. [2]

Real per capita GDP in 2012 (at base year prices)

$$= \frac{100 \times 940}{115} = 817.39$$
[1]

The % change

$$= \frac{817.39 - 800}{800} \times 100 = 2.17 \%$$
[1]

Any valid working is sufficient for [1].

An answer of 2.17% or 2.17 without workings is sufficient for [1].

- (d) Using an AD/AS diagram, explain **one** reason why deflation may lead to a higher level of unemployment. [4]

Level

Marks

0 *The work does not reach a standard described by the descriptors below.*

0

1 *The written response is limited.*

1–2

For an AD/AS diagram showing a decrease in aggregate demand and a fall in real output and APL **or** an explanation such as those offered below.

2 *The written response is accurate.*

3–4

For an AD/AS diagram showing a decrease in aggregate demand and a fall in real output and APL **and** an explanation such as those offered below.

Reasons **may** include:

- deflation discourages spending by consumers who postpone purchases in the expectation of lower prices. As a result, aggregate demand decreases, reducing the level of output and employment
- deflation discourages borrowing as the real value of debt increases. This may reduce the level of investment and consumer spending, and thus aggregate demand, reducing the level of output and employment as a result
- as the real value of debt increases, bankruptcies may result, with the closure of firms creating greater unemployment
- any other reasonable explanation should be rewarded.

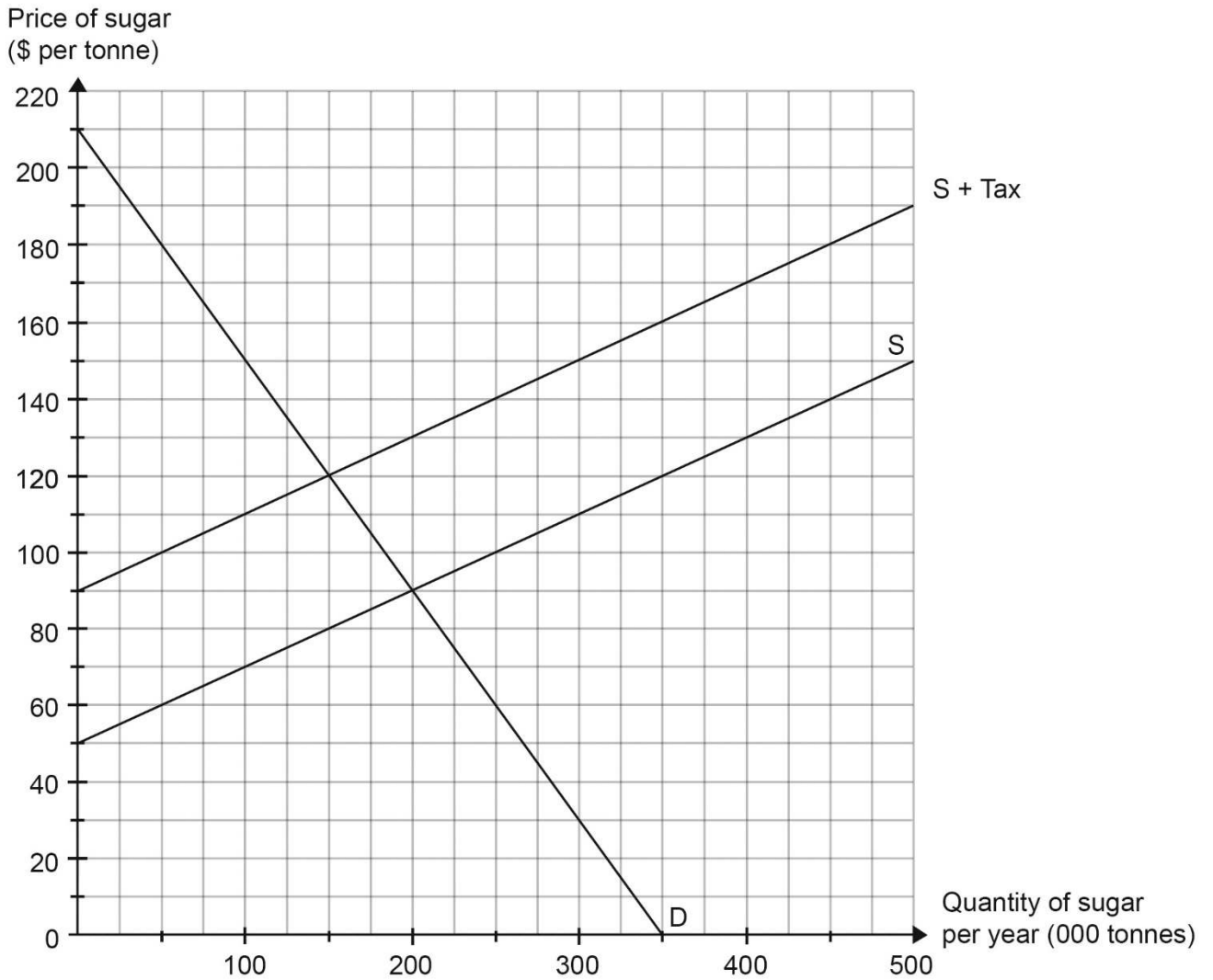
If a candidate draws an accurate diagram but explains only that AD decreases, APL decreases (hence deflation) and GDP decreases (hence greater unemployment) then a maximum of [3] may be awarded.

Candidates who incorrectly label diagrams can be rewarded with a maximum of [3].

For AD/AS, the vertical axis may be price level, average price level, or inflation. The horizontal axis may be output, real output, national output, real national output, national income (Y), or GDP. Any appropriate abbreviations, such as APL, CPI, RNO or RNY are allowable. A title is not necessary.

NB do not penalise candidates who label the vertical axis APL followed by a currency (eg APL(\$))

(e) (i) On the diagram, plot and label the new supply curve for sugar. [2]



Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>The written response is limited.</i> For an accurate supply curve.	1
2 <i>The written response is accurate.</i> For an accurate, labelled supply curve. Any relevant label is acceptable.	2
(ii) State the size of the tax per tonne of sugar.	[1]
\$40	[1]
OFR applies	

(iii) Calculate the producer surplus which will be earned following the imposition of the tax. [2]

$0.5 \times 150\,000 \times 30$ [1]

Any valid working is sufficient for [1].
 $= \$2\,250\,000$ [1]

An answer of \$2 250 000 or \$2.25 million without workings is sufficient for [1].

(iv) Determine the incidence of the tax per tonne on producers of sugar in Country C. [1]

$\$90 - \$80 = \$10$ [1]

An answer of \$10 without workings is sufficient for [1].
An answer of 25% (or equivalent) is also acceptable. However, as the question states "per tonne" then \$1.5 million should not be rewarded.

(f) (i) With reference to the distribution of income, distinguish between equity and equality. [2]

Level Marks

0 *The work does not reach a standard described by the descriptors below.* 0

1 *Vague distinction.* 1
The idea that there is a difference between "fairness" and "sameness" or an accurate outline of the meaning of either equity or equality.

2 *Accurate distinction.* 2
Equity refers to an income distribution which is fair, while equality refers to the extent to which income is distributed equally.

- (ii) Explain, using an appropriate example, why it might be argued that an indirect tax is not equitable. [4]

Level	Marks
0 <i>The work does not reach a standard described by the descriptors below.</i>	0
1 <i>The written response is limited.</i> For an explanation that an indirect tax is regressive, as the tax represents a higher proportion of income for lower income households and therefore may be considered inequitable/unfair or an appropriate example is provided and explained.	1–2
2 <i>The written response is accurate.</i> For an explanation that an indirect tax is regressive, as the tax represents a higher proportion of income for lower income households and therefore may be considered inequitable/unfair and an appropriate example is provided and explained.	3–4

An appropriate example might be numerical or might relate to a type of tax (eg a named indirect tax such as VAT) or to a named product (eg cigarettes).

NB It is not essential that the term “regressive” is used, providing that the meaning is demonstrated clearly.