1.14 Price Elasticity of Supply and Its Determinants

AQA 7136 · Calculators not allowed · about 85 minutes · Write-in edition

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer all questions. Write full sentences for the 10-mark data-response, the 10-mark evaluate question and the 25-mark essay. A calculator is not allowed. Show working for every calculation.

1 10-mark evaluated question: To what extent can government policy raise the price elasticity of supply for UK agricultural markets such as cereals and soft fruits? Answer in full sentences, weighing arguments and giving a supported judgement.

(Total for Question 1 is 10 marks)

2 Extended essay 25-mark: Evaluate the view that improving infrastructure and market information is the most effective way to increase the responsiveness of supply in food markets in the UK. Your answer should include diagrams where appropriate, consider alternative policies and constraints, and reach a supported judgement.

(Total for Question 2 is 25 marks)

3 Define price elasticity of supply (PES) for the context of a UK agricultural market such as wheat producers.

(Total for Question 3 is 2 marks)

4 Calculation: In an agricultural example, wheat price rises from £200 to £220 per tonne and quantity supplied rises from 1,000 tonnes to 1,040 tonnes. Calculate PES for wheat over this period. Show working and state the sign and unit.

(Total for Question 4 is 4 marks)

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5 Explain how stock and inventory levels affect PES, illustrated by a UK bakery versus a wheat farm.

(Total for Question 5 is 3 marks)

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6 State and briefly explain the limiting cases of PES: perfectly elastic supply and perfectly inelastic supply, using brief UK market examples for each.

(Total for Question 6 is 2 marks)

7 Data-response 10-mark: Table A shows two UK markets over one season. Market A: Fresh strawberries, price rises by 25% and quantity supplied rises by 5%. Market B: Small domestic furniture makers, price rises by 25% and quantity supplied rises by 40%. Using the data in Table A, explain why PES differs between fresh strawberries and small domestic furniture makers. Use the data in your answer and include analysis and a conclusion.

(Total for Question 7 is 10 marks)

Mark scheme · 1.14 Price Elasticity of Supply and Its Determinants

Question 1

Level 1 Limited assertion about government policy with little analysis, for example naming one policy such as storage grants or investment in irrigation with no clear evaluation. **1-3**

Level 2 Developed analysis of one or two policies showing how they could raise PES, including some discussion of costs, time lags and practical constraints. Some balance between positive and negative points. **4-6**

Level 3 Comprehensive evaluation of a range of policies (investment in storage and cold chains, subsidies for flexible greenhouse production, training to increase factor mobility, research and development, insurance schemes) assessing effectiveness, costs, incentives, time scales and unintended consequences. Provides a balanced judgement on the extent of likely PES increases and contextual limits. **7-10**

Indicative content:

- Policies that could raise PES: grants for on-farm storage and cold chains to reduce perishability and increase stock, improving short-run responsiveness
- Investment in irrigation, greenhouse and protected cropping to reduce seasonality and allow quicker output adjustments
- Subsidies for mechanisation and modular production units that shorten lead times and raise factor mobility
- Training and labour market policies to improve availability of seasonal labour quickly, increasing supply responsiveness
- R and D and support for crop varieties with faster yield response or multiple harvests per year
- Constraints and limits: long biological production lags for many crops, high costs of infrastructure, environmental regulations and land use limits reduce effectiveness
- Incentive effects and fiscal cost: subsidies may distort markets, create moral hazard or crowd out private investment; maintenance and running costs may be large
- Time lags: many policies have long payback and thus only raise long-run PES, not short-run PES
- Distributional and practical issues: small farms may not be able to access funding, and weather risk may still dominate supply response
- Supported judgement: government policy can raise PES to a meaningful extent over the medium to long run by reducing specific constraints, but significant biological, environmental and cost barriers mean short-run PES gains are limited

Question 2

Level 1 Basic, narrow answer identifying one or two possible effects of infrastructure or information improvements with little analysis. Limited or no diagrams and no meaningful judgement. **1-5**

Level 2 Some analysis of how infrastructure (storage, transport) and market information (price forecasting) can raise PES, with limited consideration of alternatives and some use of diagrams. Analysis is partly developed but evaluation is weak. **6-10**

Level 3 Clear analysis of several channels through which infrastructure and information raise supply responsiveness, including examples and diagrams. Discusses alternative policies such as subsidies, research and training and recognises constraints like biological lags and environmental limits. Begins to evaluate effectiveness with some judgement. **11-15**

Level 4 Detailed, balanced evaluation including cost, time lags, distributional effects and likely magnitude of PES changes. Integrates supply-curve diagram(s) effectively, weighs trade-offs and contrasts infrastructure/information with supply-side policies, giving a supported provisional judgement. **16-20**

Level 5 Comprehensive evaluation with multiple, well-developed lines of argument, precise diagrams awarding diagram marks, consideration of institutional and environmental constraints, evidence of likely quantitative impact, and a well-supported final judgement on the extent to which infrastructure and market information are the most effective measures. **21-25**

Indicative content:

- How infrastructure (cold chains, roads, storage) reduces perishability and increases available stocks, making market supply more responsive to price changes: illustrate higher PES with a flatter market supply curve through the same initial price and quantity, with price of the food on the vertical axis and quantity of that food on the horizontal axis
- How market information (better forecasting, price signals) allows producers to plan and reallocate resources faster, increasing PES
- Alternative policies: subsidies for protected cropping, R and D on crop varieties, training for labour mobility, insurance against weather shocks
- Constraints: biological production lags, land availability, environmental regulation limiting intensification, cost and funding limits for infrastructure
- Time horizons: infrastructure and information improve medium to long-run PES more than immediate short-run PES; discuss payback periods
- Distributional issues and access for small farms versus large agribusiness, potential crowding-out or moral hazard from subsidies
- Evaluation of relative effectiveness: infrastructure + information are powerful and durable but not sufficient alone; combined policy packages may be necessary
- Supported judgement weighing costs, time lags and the likely scale of PES improvement, concluding with an overall assessment of 'to what extent' they are most effective

Question 3

a measure of how much the quantity supplied of a good changes in response to a change in its price **B1**

numerical definition: PES = percentage change in quantity supplied / percentage change in price **B1**

Answer: PES measures how much quantity supplied responds to a change in price; PES = % change in quantity supplied divided by % change in price.

Question 4

method: percentage change in quantity supplied = (1040 - 1000) / 1000 x 100 = 4% **M1**

method: percentage change in price = (220 - 200) / 200 x 100 = 10% **M1**

accuracy: PES = 4% / 10% = 0.4 **A1**

state: PES = 0.4, unitless and positive (quantity rises as price rises) **A1**

Answer: PES = 0.4, positive and unitless.

Question 5

identifies that high stocks allow firms to increase quantity supplied quickly when price rises, raising PES **M1**

applies to a bakery: ingredient stocks can allow a quicker output response if baking capacity is available, while limited stocks or perishable bread can restrict the response; links the stated stock conditions to PES **A1**

applies to a wheat farm: stored wheat can be released quickly when price rises, raising PES; alternatively, if stocks are low or exhausted, new supply must await production, lowering short-run PES. Credit either comparison with the bakery when the stock assumptions are explained **B1**

Answer: Higher stocks allow quantity supplied to rise quickly when price rises, increasing PES. A bakery with ingredient stocks and spare baking capacity can respond quickly, but perishable bread limits finished stocks. A wheat farm with stored grain can also release stocks quickly; if stocks are exhausted, new supply must await the next crop. The relative PES depends on stock availability and production constraints; neither market must have lower PES.

Question 6

perfectly inelastic supply: PES = 0, quantity supplied unchanged regardless of price, example: unique original artwork with fixed supply **B1**

perfectly elastic supply: PES = infinity, any price below the market price yields zero supply and at that price firms supply any quantity, example: a perfectly competitive market with many identical firms in the very long run (theoretical) **B1**

Answer: Perfectly inelastic: PES = 0, quantity fixed whatever price, e.g. a unique painting. Perfectly elastic: PES = infinity, small price change yields infinite response in quantity at that price, theoretical example in perfect competition.

Question 7

Level 1 Basic identification of one or two reasons for different PES with limited use of the data. Simple statements such as 'strawberries have lower PES than furniture makers' with little explanation or weak links to the figures. **1-3**

Level 2 Clear explanation of several determinants (for example time period, stocks, ease of factor mobility) applied to the two markets and linked to the data. Shows how the percentage changes imply lower PES for strawberries and higher PES for furniture makers, with some analysis of magnitude. **4-7**

Level 3 Detailed analysis using the data: calculates implied PES values, explains multiple determinants (seasonality, perishability, stock levels, production lead times, factor mobility and alternative uses) and weighs their importance. Includes evaluation of context, limitations of the data and a supported conclusion on why the PES differs and how much each determinant contributes. **8-10**

Indicative content:

- Calculate implied PES: strawberries PES = 5%/25% = 0.2; furniture makers PES = 40%/25% = 1.6, showing large contrast
- Seasonality and perishability: fresh strawberries are seasonal and perishable, limiting storage and quick supply response, so low PES
- Stocks and inventories: furniture makers may hold components or have flexible workshops, allowing faster output increases
- Time period and production lag: strawberries require growing season and labour for harvest, so short-run supply inelastic; furniture producers can hire extra labour or add shifts more easily
- Ease of factor mobility: skills and capital for furniture production are relatively mobile domestically, raising PES; land and climate for strawberries are less mobile
- Alternative uses of resources: furniture materials and labour can switch to other goods, enabling reallocation; strawberry growers cannot quickly change crop yields
- Evaluation: note data are for one season only, external factors such as weather, agricultural quotas or supply chain bottlenecks could influence the figures; conclude that perishability and seasonality are primary reasons for low PES in strawberries, while stock, flexible production and factor mobility explain higher PES in furniture makers