

Cambridge Economics Interview Practice

Questions

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1 Brief Introduction

Because often students are told not to share interview questions after the interview (and understandably so), there is often a lack of information about the types of questions typically asked at interview. Hence I have created these questions myself to help applicants practise some of the skills required for the Cambridge Economics interview.

While these questions have not come from an interview as far as I am aware, they will hopefully provide some practice. I hope you may find at least some of these questions interesting in their own right too.

Please note there is no guarantee that these questions will be the same or similar to those which come up in your particular interview. It is

also slightly different to think about these questions by yourself, compared with talking through it aloud, especially for the mathematics questions. So I would recommend trying to talk through your answers with someone or trying to get some mock interview practice separately.

2 Pure Mathematics

Sketch the following graphs in (x, y) space, where $c > 0$ is a constant:

$$y = (2 - cx^3)^2$$

$$y = x \left(c + \frac{1}{x^2} \right)$$

3 Applications of Mathematics to Economics

3.1 Profit Maximisation

Suppose a firm has the following profit function

$$\pi = pq - q^{\frac{3}{2}}$$

where π denotes profit, p the constant price and q the quantity of the good produced.

- (a) What is the profit maximising quantity q^* as a function of p ?
- (b) Call your answer from (a) $q^*(p)$. Find the inverse of this function, in other words find p as a function of q .
- (c) Find the first and second derivatives with respect to q of this inverse function you found in (b).
- (d) Plot this inverse function and show that your graph is consistent with your answer to (c).
- (e) Return to (a). Imagine the firm can now vary the price directly, rather than treating the price as a constant. Specifically the firm can choose the price as follows:

$$p = 10 - q, \quad \pi = pq - q^{\frac{3}{2}}, \quad q > 0$$

Find the profit maximising quantity in this scenario. Prove this is a maximum.

3.2 Game Theory and Probability

Suppose a crime occurs in a public place and there are n witnesses/agents. Each witness has to make a decision about whether to report a crime. There is a benefit of v to each witness when the crime is reported by any witness. There is a cost of c to the witness who reports the crime.

(a) Suppose $n = 1$. Should the one witness report the crime?

(b) Suppose $n = 2$ and the second witness reports the crime. Should the first witness also report the crime? What happens if the other person does not report the crime?

(c) Suppose again $n = 2$. Both agents have to make a decision about whether or not to report the crime. Is there a pair of actions from which neither witness wants to deviate? (We might call this a type of equilibrium).

(d) Suppose $n = 2$. Suppose the second witness is reporting the crime with probability p . What is the expected benefit if the first witness reports the crime for sure? What if the first witness does not report the crime for sure?

(e) Set these two expected benefits from part (d) equal and derive p as a function of v, c . Call this p^* . What does this p^* represent?

(f) Suppose there are n witnesses and each witness reports the crime with probability p . What is the probability that at least one witness

reports the crime? What do you think happens as the number n increases?

4 Economic Theory

4.1 CEO Pay

Since 1970, the ratio of CEO pay to pay of the average worker has risen from 50:1 to over 300:1. Why might this have happened? Is this good for society or bad for society?

How should we decide if CEO pay is too high? Is there anything we could compare CEO pay to? What would the advantages and drawbacks of such decisions or comparisons?

Do you think the government should intervene in CEO pay and if so, how? If not, why not? Argue against the position you just stated.

4.2 Currencies and Crises

Explain how someone trading currencies could make a profit by buying and then selling a particular currency. What would they expect to happen and what factors could cause an exchange rate to change?

What causes a currency crisis when there is a fixed or managed exchange rate regime? For example the Exchange Rate Mechanism crisis.

How should governments respond to such a crisis? Can they respond?

5 Current Affairs

As people realised voters had decided to vote for Brexit, the pound dropped in value by nearly 10% overnight. Why did this happen?

What is the effect of Brexit on the economy?

Brexit allows the UK economy to set its own tariffs with other countries. Now that the UK has this freedom to set its own tariff rates, should the UK set all its tariff rates to 0%? Why or why not?

6 Reading an article

Read the following article:

<https://voxeu.org/article/what-size-fiscal-multiplier-estimate-you-can-t-refuse>

Suppose the UK Government increased its spending tomorrow by £1 billion and we wanted to measure the size of multiplier effect. What is the multiplier effect and what problems might we face in trying to estimate the size of the multiplier?

How does the article mentioned solve this problem?

Why is it easier to assess local spending rather than national spending, when estimating the multiplier?

Why does the multiplier matter?

Can you think of any potential issues with the idea behind the article?

7 Other Question Types

Note that personal statement questions will naturally be specific to your statement. As for logic questions, I recommend using the "Maths is Fun" website. But some examples of general motivation questions are:

Talk through an economics idea that you have found surprising.

What is your motivation to study economics? Do you have something you wish to pursue after your degree that uses economics?