INTERNATIONAL ECONOMICS OLYMPIAD

2025 Economics Open Questions

Open Question 1. Buying Cars

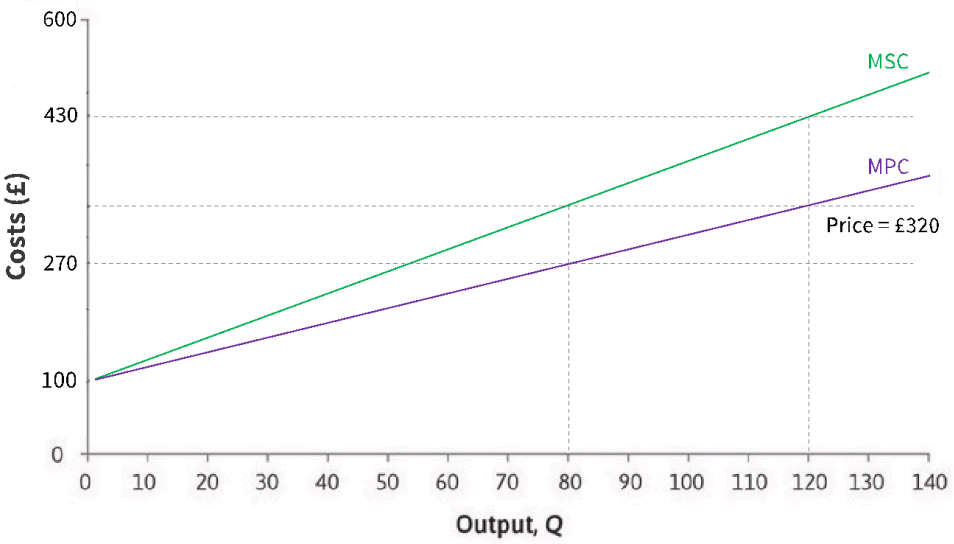
Two neighboring families, Lee and Xi, are thinking about buying new cars. Each family can choose to buy a modest or a luxury car, these decisions are made simultaneously and independently. The matrix below shows the payoffs from each possible outcome of this social interaction.

		Xi	
		Modest	Luxury
Lee	Modest	2, 2	0.5, 2.5
	Luxury	2.5, 0.5	1, 1

(a) (6 points) Provide a narrative that is consistent with all four pairs of payoffs.
(b) (6 points) Find the Nash equilibrium or equilibria for this social interaction (explain your reasoning) and discuss its social desirability.
(c) (8 points) Describe a reasonable policy that yields a socially preferable outcome and its corresponding payoff matrix.
(d) (10 points) In a nearby suburb, families replace their cars every few years and keep a close eye on one another's choices. A market-research firm surveyed the households and found out that their individual preferences are consistent with the story you came up with in **(a)**, however, the observed choices are at odds with the prediction you derived in **(b)**. Using game-theoretic reasoning, discuss why this can be the case.

Open Question 2. The Problem of Noisy Factory

A factory producing car parts is located next to a care home for the elderly. The production process is noisy, which disturbs the sleep and daily activities of the care home residents. The factory is a price-taking firm that sells its car parts at the market price of £320. The figure below shows how marginal private and marginal social costs vary with the number of units produced (*Q*).



(a) (6 points) Explain why the firm's profit-maximising choice of output is not Pareto efficient. Calculate the deadweight loss associated with this decision.
(b) (2 points) Explain why producing Q = 80 units is socially optimal.
(c) (6 points) Suppose the government assigns property rights to the care home residents, meaning they have the right to enjoy a peaceful environment.

Assuming negligible transaction costs and that the socially optimal quantity will be produced, calculate
(i) the maximum amount that the car part factory is willing to pay to produce that quantity. Explain your answer.
(ii) The minimum amount that the care home residents are willing to accept to tolerate the noise. Explain your answer.

(d) (8 points) Now suppose the government assigns property rights to the factory, meaning it has the right to make as much noise as it wants and the care home residents must compensate the firm for each unit not produced (compared to the profit maximizing quantity).
Explain how they could reach an agreement to produce the socially optimal output and how much the firm would receive as compensation.
(e) (8 points) Thinking about situations of noise pollution in the real world, explain two reasons (aside from transaction costs) why the bargaining process in parts **(c)** and **(d)** may fail to produce a Pareto efficient outcome.

Open Question 3. Economics of Student Debt

In many countries, student debt has grown dramatically. In the US, it went up from $480 billion in 2006 to $1.8 trillion in 2025. In the UK, it grew 4.7 times in just the last 11 years (from £62bn in 2014 to £292bn in 2025). While intended to expand access to education, this debt now carries significant consequences for graduates and the broader economy. This question explores those impacts.

(a) (5 points) Congratulations! You are admitted to Harvard and approved for a student loan to finance tuition ($60,000 per year), room and board ($20,000 per year), and other expenses ($7,000 per year) for four years. The loan has an annual interest rate of 8% and must be repaid in equal annual payments over 30 years after graduation (assume there is no interest while you are in college, the first payment happens in 5 years from now). Explain why your annual payments are $30,912.

(b) (3 points) After obtaining your Economics major, you found a job paying $100,000 per year. Your average income tax rate is 25%. What percentage of your after-tax income will go to your student loan payment?

(c) (6 points) Explain two reasons why a high student debt burden might negatively affect a graduate's ability to accumulate wealth over their lifetime.

(d) (6 points) Now consider alternative ways of financing education for students who cannot afford it with their family wealth. Suppose the government decides to provide education for all students from families with incomes below the threshold. Describe how it changes the incentives of the universities.

(e) (10 points) To pay for the education, the government decided to increase income tax to 50% for the high-income earners (starting at $100k a year). Unfortunately, higher taxes have reduced the expected economic growth from 3% to 1% a year. Assume that a typical working span is 45 years and calculate the value of after-tax salaries under the educational loans (starting salary $100k, grows at 3% for 45 years, tax 25%, minus the loan repayments) and then compare it with the government-funded education (starting salary $100k, grows at 1% for 45 years, tax 50%, no loan repayments). Discount at 8%. Explain which one is better for you.

Open Question 4. Songs Make Money

The company *Songify* offers users a subscription for $1 per month, providing unlimited access to a music catalog of 50 million tracks, with the average track duration being 3 minutes. The average number of paying subscribers is 5 million people, and each user listens to about 300 tracks per month (not necessarily unique tracks). *Songify* keeps 20% of the subscription revenue for itself and distributes the remaining 80% among musicians, in proportion to the number of times their tracks are played.

Mark noticed that beginner musicians often complain about low income from the platform, while popular artists receive substantial sums. Mark launched a project called *TrackFactory*:

> "*TrackFactory* is a unique music label that helps lesser-known performers increase their income on the *Songify* platform. We handle all aspects of music promotion, guaranteeing artists stable and high payouts even with a small number of listeners."

The first clients of *TrackFactory* noticed that, indeed, even though their recognition did not grow, their monthly income on the platform increased significantly. However, Songify's security service soon noticed strange activity of some *TrackFactory* artists, and their accounts were blocked for "dishonest use of the platform."

a) (10 points) How could the business model of *TrackFactory* be organized so that the income of lesser-known artists increased significantly *without* any real growth in their popularity?

b) (10 points) Why is *Songify* willing to ban this practice?

c) (10 points) Suggest a possible change to the business model or the user rules of the *Songify* platform that would help prevent such schemes in the future. Discuss if there are possible drawbacks in your suggestion.

Question 5: After-COVID Inflation

Country AA implemented COVID-19 lockdown support by increasing subsidies, offering loans to businesses, and distributing funds to citizens. These measures aimed to support household and business incomes during a time when production was significantly reduced. The government financed this support by increasing public debt, issuing and selling more government bonds, including to foreign investors.

If no other policies are introduced, this government support during COVID-19 would increase inflation in Country AA.

(a) (8 points) To counteract inflation, the central bank of Country AA raises its policy interest rate. How does this increase affect the interest rates that consumers and businesses face, such as on credit cards or business loans? Pay close attention to the exact transmission mechanism.

(b) (7 points) What are the most likely short-term effects of this interest rate increase on the economy? Consider consumption, production, and the labor market.

(c) If investors expect that the central bank's policy will cause a recession, and that the central bank will later lower interest rates to stimulate the economy, what will likely happen to long-term interest rates (e.g., 30-year bonds or mortgages) and why? (4 points) What does this imply about the shape of the yield curve? (1 point)

(d) If investors believe the current policy will control inflation without causing a recession, and expect stable growth and neutral monetary policy in the future, how will long-term interest rates compare to short-term rates? (4 points) What does this imply about the yield curve? (1 point)

(e) (5 points) Based on the discussion above about the role of expectations, how should the central bank design its monetary policy to effectively reduce current inflation?