

Mid-Term Exam

Instructions: You have 80 minutes to answer all the questions. The total number of points is 80, so the number of points per question also indicates how much time you should devote to that question.

Make sure your answers are legible and concise. Make assumptions if you need to and make sure to explain the intuition behind your results. If you get stuck with the math in the theoretical exercise, try to guess the answers to the remaining questions providing intuition.

I. Short Questions (25 points)

Determine whether the following statements are TRUE, FALSE or UNCERTAIN, and justify your answer in one paragraph (one sentence could be enough). Grading will be based on the justification (not on the simple TRUE, FALSE, UNCERTAIN answer). Please be concise.

1. The representative consumer always gains from trade. **(5 points)**
2. A firm exhibits internal scale economies if it has a fixed cost and constant marginal costs. **(5 points)**
3. In the specific-factors model, population growth (i.e., growth in the mobile factor) hurts all three factors. **(5 points)**
4. In a two-country model of trade, world relative prices must always fall between the pair of autarky relative prices. **(5 points)**
5. In a specific-factors model with Cobb-Douglas preferences $D_C^{1/2} D_F^{1/2}$, an exogenous 10% increase in the relative price of cloth leads to an increase in real wages. **(5 points)**

II. Short Question (10 points)

You are asked to provide economic advice to the U.S. administration regarding the following economic policy proposals.

- *“The solar panel industry in the United States is currently not able to compete with the international competition. We should put import barriers on solar panels. When US firms are able to compete, we can re-open the imports of solar panels.”*

1. Using the concepts presented in this class, describe the economic rationale for this proposal. Be concise: one paragraph answers only please. **(5 points)**
2. Next, list three relevant concerns with this proposal. Again, please be concise. **(5 points)**

III. Theoretical exercise (25 points)

Consider a world with 2 countries, US and Mexico, and two goods, cars (C) and food (F). Both goods are produced using both capital and labor. Suppose the production function for cars and food in the US is: $C = 3 \min(L, K)$ and $F = 5 \min(L, K)$. There are 50 units of both capital and labor in the US. The production function for both goods in Mexico is: $C = \min(\frac{1}{5}L, K)$ and $F = \min(\frac{1}{5}L, K)$. There are 500 units of labor and 100 units of capital in Mexico.

The utility function is the same in both countries: $U(C, F) = C^{\frac{1}{3}}F^{\frac{2}{3}}$.

1. Which country has an absolute advantage in each good? Which country has a comparative advantage in each good? **(5 points)**
2. Draw the world relative supply curve of cars and food with Q_F/Q_C on the horizontal axis and P_F/P_C on the vertical axis. **(5 points)**
3. What is the world relative demand curve for cars and food? Draw the world relative demand curve on the same graph as the world relative supply curve. **(5 points)**
4. Under free trade what is the equilibrium price of food relative to cars P_F/P_C ? How many units of cars and food do the US consumers consume under free trade? **(5 points)**
5. What are the welfare effects from trade on US consumers? Hint: Compare consumption under free trade with consumption under autarky. **(5 points)**

IV. Theoretical exercise (20 points)

Elon Musk and Akio Toyoda are stranded on a desert island. There are only two goods on the island: Teslas (T) and Toyotas (Y). Elon and Akio have the same Cobb-Douglas preferences $U(T, Y) = T^{1/5}Y^{4/5}$. They have different endowments of the goods. Elon owns 10 Teslas and 0 Toyotas, and Akio owns 10 Toyotas and 0 Teslas. Both Elon and Akio take prices as given.

1. What is the price of Teslas relative to Toyotas under autarky? **(5 points)**

2. Suppose one morning they discover the rest of the world which is endowed with 10 Teslas and 90 Toyotas. If they can costlessly trade with the rest of the world (which has the same preferences), what will be the world price of Teslas and Toyotas? **(5 points)**
3. Are there aggregate gains from trade on the island? **(5 points)**
4. Is Elon gaining from trade with the rest of the world? **(5 points)**