

Midterm Exam #2

Answer Any **Three Questions**. Answer all parts to each question.

1. Consider a small country which produces two goods, wheat and clothing. All producers in the economy behave as perfect competitors. The domestic supply and demand curves for wheat in the country are:

$$Q^d = 1200 - 100P^c; \quad Q^s = 50P^f$$

where Q^d represents quantity demanded, Q^s represents quantity supplied, P^c denotes the price paid by (wheat) consumers and P^f denotes the price received by wheat producers within this country. Suppose that the world price of wheat is: $P^w = 4$ (\$/bushel).

- a) Assuming free trade, find domestic price, production, consumption and imports (or exports) for this country. **Calculate**, and show *graphically*, the welfare impact on consumers and producers of the movement from autarky to free trade. **(8 points)**
- b) Assume the country imposes an **import quota** that restricts wheat imports to **300 (bushels)**. Show graphically how this import quota affects domestic prices, production and consumption; who gains and who loses from this policy? Compared to free trade, **calculate** the impact of this policy on overall welfare. **(8 points)**
- i. Explain whether this import quota on wheat will affect domestic clothing production and justify your answer. By how much, if at all, does **clothing output** change due to this import quota? A **numerical answer** is required. (In answering, interpret the price of wheat as the *relative* price of wheat in terms of clothing – *i.e.*, assume the price of clothing is \$1/unit). **(6 points)**
- c) Suppose the purpose of this import quota was to help domestic wheat producers. Can you think of an alternative policy that would accomplish this goal at a lower welfare cost? If so, what is it and why is it the better policy? **(6 points)**
- d) Suppose, instead, that the goal of the policy is to reduce the country's dependence on food imports. Given this goal, what is the best policy for the government to use? Explain **(5 points)**

2. Consider a partial equilibrium model of the world oil market. For simplicity, assume the US is the only oil importer and that (collectively) OPEC is the only oil exporter. Supply and demand curves in each country (or economic bloc) are given by:

$$US: \quad S^{us} = 10P^{us}; \quad D^{us} = 1,500 - 5P^{us}$$

$$OPEC: \quad S^o = 20P^o; \quad D^o = 500 - 5P^o$$

where P^o, P^{us} represent OPEC and US prices, respectively.

- a) Calculate the free trade equilibrium price, production and consumption levels in each country, and the equilibrium trade flow. **(7 points)**
- b) Show how a US import tariff of **16** (per barrel) affects prices in the US and in OPEC, and the volume of world trade in oil. **(5 points)**
- i. Who gains and who loses in the *US* from this policy? Calculate the overall impact on US welfare from this import tariff. **(5 points)**
 - ii. Calculate how OPEC welfare is affected by this tariff. Overall (combining the welfare change in the US and in OPEC), does the tariff raise or lower world welfare? **(6 points)**
- c) Assume international agreements prohibit the US from imposing tariffs on imported oil. Suppose some domestic activists argue that the US government should subsidize development of alternative energy sources (e.g., solar power) that could reduce US dependence on imported oil (i.e., reduce imports). How would such subsidies affect world oil prices? Could these subsidies possibly increase US welfare? **(6 points)**
- i. Do you think international agreements should also ban subsidies to develop alternative energy sources? Justify your answer. **(4 points)**

3. Answer all parts.
- a) Consider the market for lumber (wood), which can be characterized as a perfectly competitive market. In Canada much of the wood comes from trees grown on land owned by the national government (some US lumber also comes from national parks, as well as from privately owned forests). The Canadian government limits the number of trees that can be cut, annually, on national lands, and charges a fee to the companies that harvest these trees; US firms claim that the amount the Canadian government charges is less than the market price for trees, and therefore Canada is subsidizing its wood industry. Under free trade, the US imports wood from Canada. {In answering, think of trees as just one of the inputs used to produce wood}.
- i. For a competitive industry in which the US imports the product from Canada, how do Canadian production subsidies affect US producers, consumers and overall US welfare? **(6 points)**
 - ii. For the lumber industry described in the beginning of this part, *given* the Canadian government limit on the number of trees that can be harvested from public land, how would an increase in the fee Canadian firms have to pay to harvest the trees affect the market price of wood? Explain your answer. **(5 points)**
- b) Consider a world with two goods, clothing and computers. Assume Panama is a small country and that under free trade it would export clothing and import computers.
- i. Draw a diagram showing the **general equilibrium** impact of an import tariff on domestic production, consumption and trade flows for Panama (use the production possibility frontier and indifference curves in this diagram). *How* does your diagram show (or assume) that Panama's Balance of Trade is zero (i.e., the value of exports equals the value of imports)? **(5 points)**
 - ii. Given the import tariff, show how an export subsidy of equal magnitude affects the equilibrium. What is the overall impact on production, consumption and welfare of the combined use of the import tariff and export subsidy? **(5 points)**
- c) Assume that the US produces (mines) coal, which is sold either in the US or exported. For simplicity, assume the US is a small country, so that the world price of coal is **not** affected by US exports. Further, assume that coal production (extraction) **produces** pollution, which harms nearby residents (through reducing water quality, etc); assume analysis estimates that the economic damages from this pollution approximate \$50/ton. Currently, coal producers are not subject to any regulations or taxes (fines) related to this pollution.
- i. Assuming no government intervention, show that the competitive equilibrium is not efficient (does not maximize total surplus). Show graphically how to estimate the overall inefficiency of this equilibrium (as compared to the optimal output level). **(4 points)**
 - ii. What is the optimal government policy to correct this market failure? Is trade policy part of the optimal policy? Be precise. **(4 points)**
 - iii. Suppose trade policy is the only feasible policy for the government. What is the optimal policy? Can you place an upper bound on the level of this policy? Be precise. **(4 points)**

4. Answers all parts.

a) Currently there are negotiations about creating a Free Trade Area of the Americas (FTAA), which would embrace (almost) all countries in the Western Hemisphere. Some South American countries (including Argentina and Brazil) have already created a regional free trade area (called *Mercosur*) and are not anxious to expand the free trade area to include the United States. As discussed in class, there are both positive and negative aspects associated with a free trade area.

i. From the perspective of a small country, *briefly* explain the possible benefits, and costs, of joining a free trade area. **(5 points)**

ii. Next, consider a partial equilibrium model of the market for computers. Assume Argentina is a small country, which can produce computers domestically or can purchase computers from Brazil or the US at given prices. The supply and demand for computers in Argentina, and the price of computers in the US and Brazil, are given by:

$$Q^s = 3P^c; \quad Q^d = 6,000 - P^c; \quad P^{us} = 500; \quad P^B = 700$$

where P^{us} is the US price, and P^B is the Brazilian price. Assume the tariff on computer imports into Argentina is initially **400**, regardless of whether the imported computers are from the US or Brazil. When Argentina joins *Mercosur*, the tariff on Brazilian goods is eliminated but the tariff on US goods is unchanged. How does joining *Mercosur* affect price, production, consumption and imports into Argentina, and what are the **welfare gains (or losses)** in Argentina (a numerical answer is required)? Relate your answers to the concepts of trade creation and trade diversion. **(8 points)**

iii. Suppose that, before joining *Mercosur*, Argentina converted its tariffs into a quota (equal to the amount of imports under the tariff). **After** joining *Mercosur*, computers can be imported from Brazil without any restriction, whereas imports from any other country (the US being the only other country, in this example) would be subject to the quota limit. Under these circumstances, how would joining *Mercosur* affect the price of computers in Argentina, the quantity and origin of imports, and welfare? **Given the quota, can Argentina be hurt by joining Mercosur?** Compare your answers to parts (ii) and (iii) and explain the difference, if any. **(8 points)**

b) Article XVII of the General Agreement on Tariffs and Trade (the GATT), which has been incorporated into the World Trade Organization (WTO), has been interpreted, since 1955, as allowing developing economies to promote industrialization by using tariffs (or quantitative restrictions) to protect selective sectors of the economy. The rationale for this “exception” for developing countries is the *Infant Industry Argument*.

i. Briefly discuss the economic assumptions underlying the “*infant industry argument*” for protection. What market failures, if any, occur under these assumptions? **(6 points)**

ii. Given your discussion in part (i), is trade protection the optimal form of government intervention? If not, what is? Provide an economic justification of your answer. **(6 points)**

5. Answer all parts.
- a) Canada and the US both export a large quantity of wheat to the rest of the world, and world wheat prices are affected by the exports, and trade policies, of each country. Needless to say, perfect competition prevails in these agricultural markets. However, suppose that Canada, in order to increase its share of the world wheat market, subsidizes exports.
- i. How do the Canadian subsidies affect US producers, consumers and US welfare? **(5 points)**
 - ii. Given the Canadian subsidies, how would US export subsidies affect US producers, consumers and overall US welfare? Is this a good policy for the US? *Justify your answer using economic analysis.* **(5 points)**
- b) Suppose there are only two producers of regional jets in the world; one producer (Embraer) is located in Brazil, while the other (Bombardier) is located in Canada. For simplicity, assume all of the planes they produce are sold to third countries (ROW, the rest of the world). Each firm recognizes its ability to influence price, so their marketing strategy (sales) reflects the knowledge that, if they try to expand sales, they will need to reduce price.
- i. In this “duopoly” equilibrium, do you think price will exceed, or equal, marginal cost? Discuss how equilibrium output and price are found, and justify your conclusion. **(4 points)**
 - ii. Given this market structure, could Canada as a whole gain from subsidizing exports of regional jets? How, and why, does your answer differ from that for part (a), where markets were competitive? Carefully justify your answer. **(5 points)**
 - iii. If both countries choose to subsidize exports, what is the likely outcome in terms of the welfare for each country, and for importers of regional jets? Explain. **(4 points)**
- c) State the economic identity that relates the **Current Account** balance to macroeconomic variables (e.g., income, consumption, savings, etc.). Why, if at all, should a nation worry about a Current Account deficit? **(5 points)**
- i. The U.S. Congress enacted a law that required the imposition of import tariffs if the U.S. current account balance exceeded a critical level. Using the identity stated above, discuss how - if at all - an across the board tariff on all imports could reduce the Current Account deficit. **(5 points)**