

Midterm Exam #2

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

1. Consider the market for beef within a small country. The domestic supply and demand curves for beef are given by:

$$Q^d = 400 - 20P^c; \quad Q^s = 60P^f$$

where Q^d represents quantity demand, Q^s represents quantity supplied, P^c denotes the price paid by beef consumers and P^f denotes the price received by beef producers within this country. Suppose that the world price of beef is: $P^w = 2$ (\$/pound).

- a) Assuming free trade, find domestic price, production, consumption and imports for this country. **Calculate**, and show *graphically*, the welfare impact on consumers and producers of the movement from autarky to free trade. **(7 points)**
- b) Suppose the country implements an **import tariff** of **2** per unit of beef imported. Show graphically how this policy affects domestic prices, production and consumption; who gains and who loses from this import tariff? As compared to free trade, calculate the impact of this policy on overall welfare. **(8 points)**
- i. Assume the country produces only two goods, beef and clothing. How does the import tariff on beef affect the output of clothing? By how much does **clothing output** change due to this import tariff for beef? A **numerical answer** is required. **(6 points)**
- c) Suppose the import tariff were replaced by a quota which limited beef imports to **80** units. Compare the economic effects of these two policies. **(6 points)**
- d) Suppose the world price fluctuates between **1.50** and **2.50**. For example, in even-numbered years (2004, 2006,...) the world price is **1.50** and in odd-numbered years (2003, 2005,..) the world price is **2.50**, so that the average world price is **2.00**. Further, the government is considering two trade policies: (i)an import tariff of **2**; and (ii)an import quota of **80**. Will average imports be the same under the two policies? What differences, if any, are there between the two policies in terms of annual domestic price, annual domestic output, consumption and imports? **(6 points)**
2. Answer all parts.
- a) Consider a small country (Ecuador) which produces and consumes two goods, clothing (C) and machine tools (T). Suppose, under free trade, the country imports tools and exports clothing.
- i. Using the production possibility frontier and indifference curves, show how an import tariff affects domestic production of each good, consumption and domestic welfare. **(6 points)**
- ii. Given the import tariff, how would an export subsidy on clothing affect domestic welfare? Assuming the import tariff and export subsidy are at the same rate (%), what is the overall impact of this policy? Explain. **(5 points)**

(question 2, continued)

- b) Consider a small country that imports peanuts. Assume the government wishes to raise the income of domestic peanut producers.
- Use a partial equilibrium model to compare the impact of a domestic production subsidy and an import tariff. Which is the better policy to accomplish the stated goal? **(6 points)**
 - Assume the government uses an import tariff to help producers. Given this tariff, how would a small tax (or subsidy) on domestic peanut consumption affect welfare? Explain. **(5 points)**
- c) Suppose, under free trade, a decline in world textile prices causes a surge in U.S. textile imports.
- Under what conditions will this decline in world, and hence US, prices cause unemployment in the U.S.? **(5 points)**
 - If unemployment occurs, should the government respond by limiting (via quotas) or taxing (via tariffs) imports? Discuss, and rank, the possible policies the government could use to combat this unemployment. **(6 points)**

3. Answer All Parts.

- a) Assume Brazil, a price taker on world markets, produces, consumes, and imports computers. The production of each computer requires exactly one microprocessor. Let $\{P_c^w, P_m^w\}$ denote the (given) world prices of computers and microprocessors, respectively, and $\{P_c^d, P_m^d\}$ denote the domestic prices for computers and microprocessors. Producers (and consumers) within Brazil behave competitively, with the following domestic supply and demand curves for computers:

$$S = (P_c^d - P_m^d); D = (5,000 - P_c^d)$$

Since each computer uses one microprocessor, $(P_c^d - P_m^d)$ represents the net price domestic computer producers receive to cover (marginal) production costs (and hence the area under the inverse supply curve for computers measures the production costs, exclusive of microprocessors, for producing computers). Finally, assume world prices are: $P_c^w = 1,500$; $P_m^w = 500$.

- Calculate domestic production, consumption and computer imports under free trade. **(4 points)**
- Suppose Brazil imposes a 20% tariff on imports of **both** computers and microprocessors. Assuming microprocessors are **not** produced in Brazil, how will these import tariffs affect domestic production, consumption, and imports of computers? Calculate the gains (or losses) to (computer) producers, computer consumers and the government, and the overall welfare impact of this policy. **(7 points)**
- Given the import tariff on computers, how does eliminating the import tariff on microprocessors affect domestic computer production and overall domestic welfare if microprocessors were not produced in Brazil? Explain and **calculate** the welfare impact of eliminating this tariff. **(6 points)**

(question 3, continued)

- iv. How would your answer to part (iii) change if microprocessors were produced in Brazil? (A qualitative answer suffices; a quantitative answer is not needed for *this* part). **(5 points)**
- b) Consider a small country that, under free trade, exports a raw material (logs from trees), and also exports manufactured products (e.g., furniture) produced from these logs.
- i. What impact would a **ban** on exports of the raw material (logs) have on exports of the manufactured product (furniture)? Explain. {for simplicity, you may assume that the only domestic use for logs is to produce furniture}. **(5 points)**
- ii. If the goal of the government is to increase domestic furniture output to a certain level, what is the optimal policy to achieve this goal? Compare the welfare impact of this policy to an export ban on the raw material. **(6 points)**
- {A number of countries use export bans on raw materials. A long-standing dispute between Canada and the US on “softwood lumber” is partly due to a Canadian ban on exports of logs}

4. Consider a partial equilibrium model of the market for wine in a world with two large countries, the US and Europe. The supply and demand curves in each country are given by:

$$US: \quad S^{us} = 10P^{us}; \quad D^{us} = 400 - 10P^{us}$$

$$Europe: \quad S^e = 20P^e; \quad D = 500 - 20P^e$$

where P^e, P^{us} represent European and US prices, respectively.

- a) Calculate the free trade equilibrium price, production and consumption levels in each country, and the equilibrium trade flow. **(5 points)**
- b) Discuss whether Europe can benefit from some trade policy (other than free trade) and graphically show how this optimal policy is determined. **(6 points)**
- c) Using the particular functions given, calculate Europe’s optimal trade policy and calculate how this policy affects European welfare, US welfare and overall welfare. Also, discuss who gains and who loses within each country from this European policy. **(6 points)**
- d) Given the European trade policy, does the US have an incentive to implement its own trade policy? If so, show *graphically* how the optimal US policy is determined. **(5 points)**
- e) Show *graphically* the combined effects of the European and US trade policies and show *graphically* the net welfare change to each country from these policies. Can both countries be better off in this equilibrium than in free trade? Can both countries be worse off? If so, why don’t both countries eliminate these policies and move to free trade? Explain. **(6 points)**
- f) Finally, suppose an international agreement is reached to eliminate all tariffs, but this agreement does not cover domestic production policies (such as domestic production taxes or subsidies). Can the U.S. gain by implementing some production policy? Justify your answer, indicate what policy – if any – would be beneficial, and discuss whether it is necessary for these international agreements on tariffs to also cover domestic policy. **(5 points)**

5. Answer all parts.

a) Consider a small country that produces cars. *Suppose that domestic production of cars, due to learning spillovers, increases productivity in other industries (e.g., machine tools) within this country.* Finally, suppose that under free trade (and no government intervention) the country would import cars.

i. Under these assumptions, can an import tariff increase welfare? Also, indicate what is the best policy and compare the welfare effects of this policy to those of a tariff. **(8 points)**

ii. Illustrate this situation by assuming the following supply and demand curves:

$$Q^s = 2P^d; \quad Q^d = 150 - 3P^d; \quad P^w = 15$$

where Q^s is domestic supply of cars, Q^d is domestic demand for cars, P^d is the domestic price, and P^w is the world price. *Finally, assume that domestic production of cars provides an external benefit to domestic producers of other goods (by increasing their productivity) of **\$3 per unit of car production** (all prices are measured in thousands of dollars).* State the optimal policy and calculate the welfare gained by implementing this policy. Also, show graphically why this policy is better than a tariff. **(8 points)**

iii. EXTRA CREDIT. Assuming only trade policy can be used, calculate the (second) best tariff for this model. **(6 points)**

b) Assume there are three countries (economic regions) in the world, the U.S., Europe and Chile. Further, assume Chile is relatively small compared to the U.S. and Europe, so that the volume of Chile's imports (or exports) has a negligible effect on prices in the other countries. Currently, Chile has the same tariffs on imports from the U.S. and Europe, but it is considering joining a free trade area with Europe.

i. From Chile's perspective, discuss the costs and benefits of joining an FTA with Europe. If currently about 20% of Chile's trade is with Europe and 80% with the U.S., is Chile more likely to benefit from joining an FTA with Europe or with the U.S? Explain. **(6 points)**

ii. Consider a partial equilibrium model of trade in tractors. The U.S. and Europe produce identical tractors, which Chile can buy; the prices for tractors from the US and Europe are, respectively: $P^{us} = 20$, $P^e = 24$. Chile currently has in place a tariff of $t = 10$ on imports from either the US or Europe. Domestic demand and supply within Chile are:

$$S = 2P; \quad D = 200 - 2P$$

Calculate the impact on Chilean production, consumption, imports and welfare if Chile joins an FTA with Europe. **(7 points)**

iii. Using the model of part ii above, would the gains from joining the FTA with Europe have been smaller or larger if the original common tariff had been larger than **10**? Explain (you do not need to do any numerical calculations for this part) **(4 points)**