

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

1. Consider the market for cars and steel within a small country (Peru). Assume that under free trade, cars and steel are produced domestically and both goods are also imported. Further, **assume that each car produced domestically requires one unit of steel**, as well as other inputs (e.g., labor). Also assume that the only domestic use for steel is in car production. Assume the following supply and demand curves in Peru:

$$Q_c = 2(P_c^d - P_s^d); \quad D_c = 240 - 2P_c^d$$

$$Q_s = 2P_s^d; \quad D_s = Q_c$$

where:  $Q_c$  is the domestic supply (production) of cars;  $Q_s$  is the domestic supply of steel;  $D_c$  is the domestic demand for cars;  $D_s$  is the domestic demand for steel;  $P_c^d$  is the domestic price of cars; and  $P_s^d$  is the domestic price of steel.

To understand the above supply and demand equations, note that - since steel is used to produce cars - higher steel prices raise the cost of producing cars, and hence lower car output (that is what the supply curve for cars implies). The demand for cars and supply curve for steel are standard. Finally, since the only domestic use for steel is to produce cars, the domestic demand for steel equals domestic car output.

Finally, assume the following world prices for cars and steel, respectively:  $P_c^w = 40$ ;  $P_s^w = 10$

- a) Calculate the free trade level of production, consumption and imports of each good. **(5 points)**
- b) Suppose a tariff of **20** is imposed on car imports, i.e.,  $t_c = 20$ . How does this tariff affect the domestic price, consumption, production and imports of **both** cars and steel? **(5 points)**
  - i. Calculate the impact of this import tariff on cars on domestic consumer surplus, producer surplus (for both car and steel producers), and overall welfare. **(5 points)**
- c) **Given the tariff on cars**, how will an import tariff on steel affect domestic price, consumption, production and imports of each good? Who gains and who loses from the tariff on steel? Explain. **(5 points)**
  - i. How does a small tariff on steel imports affect domestic welfare? Carefully justify your answer. **(5 points)**
- d) Suppose, before imposing the import tariff on steel, the tariff on cars is converted into a quota (set at the level of imports under the tariff  $t_c = 20$ ). Given this quota, how does a small tariff on steel imports affect domestic price, consumption, production, imports of each good and welfare? Compare your answer to that of part (c) (numerical calculations are not required). **(8 points)**

2. Answer all parts.
- a) What is the economic significance of a current account deficit and how will this deficit affect the country's net foreign indebtedness? Explain. **(6 points)**
- i. What impact, if any, does a current account deficit this year (2003) have on the current account balance in subsequent years? Explain your reasoning. **(6 points)**
- ii. How, if at all, will import tariffs affect the current account balance? Are these import tariffs likely to have more impact on the current account balance when they are imposed on imports from just one country or on imports from all countries? Explain your answer. **(5 points)**
- b) Answer the following "true-false & why questions". The points earned will be based on your explanation.
- i. "Suppose the US and Europe both export agricultural goods to third countries. Currently, Europe subsidizes its agricultural exports. Given European subsidies, it would be beneficial to the US to subsidize its own agricultural exports." *True or false; explain.* **(8 points)**
- ii. "Suppose the US currently has a binding quota on cheese imports. Given this quota, the imposition of a small tariff on cheese imports will have no effect on domestic prices and will not affect overall welfare." *True or false; explain.* **(8 points)**

3. Consider a small country (Australia) with the following supply and demand curves for beef:

$$Q^d = 400 - 3P^c; \quad Q^s = 5P^f$$

where  $Q^d$  is domestic demand,  $Q^s$  is domestic supply (output),  $P^c$  is the price paid by consumers and  $P^f$  is the price received by producers. Suppose that the world price of beef is given by:  $P^w = 90$ .

- a) Assuming there are no market failures and no taxes, find the free trade levels of production, consumption and imports (exports). Also, calculate the gains from free trade. **(6 points)**
- i. Do increases in the world price of beef necessarily benefit Australia if it pursues free trade? Explain. **(3 points)**
- b) Next, modify the question and assume that beef production creates waste products (pollution) that damage the environment. In particular, assume that studies estimate that pollution damages are **10 per unit output of beef**. Assuming no policy is taken to correct the pollution, calculate the gains from free trade (as compared to autarky). **(5 points)**
- i. Do increases in the world price of beef necessarily benefit Australia if it pursues free trade and it implements no other policy? Explain. **(3 points)**
- c) Given the pollution as described in part (b), what is the optimal government policy? How would this policy affect domestic consumers and domestic producers? (You do not need to calculate the changes in surplus from the policy). **(5 points)**  
*(question 3, continued on next page)*

- d) Finally, suppose that the only government policy that can be used is trade policy. Given the pollution, what trade policy should the government adopt? Is this trade policy as beneficial as the policy you recommended in part (c)? Why or why not? **(5 points)**
- i. Given the pollution, calculate the magnitude of the optimal trade policy. (If you do not know how to do this, at least show graphically the welfare changes from the trade policy you recommend). **(6 points)**

4. Answer all parts.

- a) Suppose the U.S. and Chile are discussing forming a Free Trade Area (FTA) between the two countries. To consider the likely impact on Chile of this FTA, consider trade in a particular product (e.g., tractors). Assume Chile is a small country, and can import tractors from Japan or the US at prices which are unaffected by Chilean imports. These prices, as well as supply and demand for tractors in Chile, are given by:

$$Q^s = 3P^d; \quad Q^d = 500 - 2P^d; \quad P^{us} = 60, \quad P^j = 45$$

Assume Chile originally has a tariff of **25** on imports from both countries.

- i. For this industry (tractors), calculate the net gains to Chile from forming an FTA with the US. (A numerical answer is required) **(7 points)**
- ii. Suppose Chile, before forming the FTA with the US, converts its tariff on imports from Japan into an import quota (equal to the level of imports under the tariff). Given this import quota on Japanese goods, suppose Chile then forms an FTA with the US, eliminating the tariff on US goods. Calculate the gains from forming the FTA in this case. *Can Chile ever be worse off?* Explain the difference, if any, between your answers to (i) and (ii). **(7 points)**
- iii. Given that Chile and the US have formed an FTA, how would US welfare be affected if Chile also negotiated an FTA with Europe? Explain your answer. **(5 points)**
- b) “The car industry in China is relatively new, and hence domestic firms are not as efficient as foreign car producers. However, evidence from other countries shows current car production will increase the efficiency of these Chinese firms over time. Consequently, it is in the Chinese national economic interest to protect the industry with import tariffs (or quotas) on cars.” True or false, and why? **(7 points)**
- c) A developing country is trying to encourage exports and discourage imports. In order to accomplish this goal, the country is considering imposing import tariffs and export subsidies. What is the likely effect of this combination of policies? **(7 points)**

5. Answer all parts.

- a) Consider a small country which imports steel. There is a **single** domestic producer of steel with the following cost curve:

$$TC(Q) = (1/2)Q^2$$

Domestic demand for steel and the world price are given by:

$$D = 100 - P^d; \quad P^w = 20$$

where  $P^d$  denotes the domestic price of steel. Naturally, the single domestic firm wants to maximize its profits, and will exert its monopoly power *whenever* possible. However, its ability to do so is potentially constrained by imports of foreign steel.

- i. Assume an import tariff of **25**. Calculate domestic price, production, consumption and imports under this tariff. (Hint: What is the maximum price the domestic firm can charge? What happens to price and imports as it increases its sales?) **(5 points)**
  - ii. Suppose the import tariff is replaced by an import quota equal to the level of imports that occurred under the tariff. Given that there is only one domestic steel producer (who realizes the impact on domestic price of his production), will the equilibrium under the quota be the same as under the tariff? Explain. (see the hints from part i. Is your answer to those questions the same in this part?). **(5 points)**
  - iii. **Calculate** equilibrium domestic price and production under the quota, and compare to that under the tariff. Which policy yields a higher overall level of welfare? Explain your answer. **(7 points)**
- b) Consider two large trading blocs, the US and Europe. Suppose the US imports chemicals from Europe, and that producers (and consumers) in both countries are perfectly competitive. Since each country is large, US imports (and European exports) affect the world price.
- i. Given the supply and demand curves for chemicals in each country, and assuming that under free trade Europe exports (the US imports) chemicals, show graphically how the European “optimal tariff” is determined. Also, show the welfare effects on each country, and the overall welfare effects, of this “optimal tariff”. **(6 points)**
  - ii. Suppose international agreements prevent Europe from using any trade policy. However, suppose there are no agreements that prevent Europe from taxing or subsidizing domestic production of chemicals. What policy should Europe adopt in this case, and will this policy be as beneficial to Europe as the tariff? **(5 points)**
  - iii. Finally, suppose both Europe and the US use trade policy to try to improve their own welfare. Show graphically how the resulting equilibrium is determined. Do both countries gain from these combined policies? Does at least one country gain? Explain your answer. **(5 points)**

Non-economic objective and proper policy

If no tariff, what production policy?

Strategic trade

Current account balance

Effective protection

Maybe reduce first question to a half.

Need a numerical problem

$$TC(x) = f(x) + 7Q_y Q_x$$

$$Mc(x) = f' + 7Q_y = P_x$$

Optimal tariff

Infant industry

Quota vs. tariff