

Assignment #3

Due Date: November 12

1 Import Tariffs and Export Promotion in a Small Open Economy's General Equilibrium

A small open economy produces cars and grows food with some unspecified number of factors of production. The opportunity costs of car production in terms of food change with the production pattern but are lower than those of its trading partners.

- Draw a production possibility frontier that is consistent with the above assumptions.
- Depict an initial world trade equilibrium and the consumption possibilities of the small open economy, consistent with the above assumptions.
- Suppose the small open economy imposes a tariff on its imports. How do the country's Terms of Trade change? How does the domestic price ratio change? How will the small open economy's production pattern change? How will the small open economy's consumption and trade pattern change? How is welfare affected?
- Suppose the small open economy promotes its exports with a cost subsidy to producers. How do the country's Terms of Trade change? How does the domestic price ratio change? How will the small open economy's production pattern change? How will the small open economy's consumption and trade pattern change? How is welfare affected? Is there a difference to the import tariff?

2 Intraindustry Trade

Monopolistic chair makers produce with a total cost function

$$TC = F + c \cdot Q_C,$$

where $F = 500,000$ and $c = 100$.

- What are the average and marginal cost functions of a chair maker?

Each of n chair makers faces residual demand of

$$Q_C^d = S \cdot [1/n - b \cdot (P_C - \bar{P}_C)],$$

where $S = 50,000$, $b = 1/1,000$ and \bar{P}_C is average equilibrium price.

- What are marginal revenues? [*Hint*: You may use the formula in the textbook. Otherwise, reformulate demand so that $P_M = P_M(Q_M^d)$ and derive total revenue; differentiate total revenue with respect to quantity.]
- Graph the average-cost-variety (CC) and the price-variety (PP) schedules for this industry in a diagram that shows price, average cost and the number of firms (varieties).
- Find the number of firms (varieties) in this industry in the absence of trade. What is price in a symmetric autarky equilibrium?
- Chairs can be traded with other countries at not cost. Using the average-cost-variety (CC) and the price-variety (PP) schedules above, show how equilibrium price and the equilibrium number of firms change after trade.
- How could you measure the gains from trade? Explain briefly.

3 Import Tariff in Partial Equilibrium

Home's demand and supply for cars are given by: $D = 130 - 30 \cdot P$ and $S = 10 + 30 \cdot P$, while Foreign's demand and supply for cars are: $D^* = 60 - 30 \cdot P$ and $S^* = 40 + 30 \cdot P$ (P is thousands of US\$).

- Determine the autarky equilibrium, and calculate domestic price for each country. Illustrate your answer with suitable graphs.
- Derive Home's import demand schedule and Foreign's export supply schedule. Calculate and depict the world price when both countries trade, and show the traded quantities.
- Home imposes a tariff of $\tau = .4$ per car. Calculate and depict the price that Home consumers pay. Show domestic consumption, production and the trade volume.
- Show graphically how the tariff affects Home welfare. Distinguish Home consumer surplus, producer surplus and government revenues.
- Did the tariff improve efficiency? Show the net efficiency gain or loss graphically.

4 Export Promotion in Partial Equilibrium

Consider the two countries from question 3 again. Home has a tariff of $\tau = .4$ per car in place.

The Foreign government decides to grant an export subsidy of $\tau = .4$ per exported car.

- How does this subsidy affect Home welfare?
- Show the changes to surpluses and tax revenues for Foreign.