Economics 101 — Fall 2018

International Trade

Problem Set 3

November 15, 2018

Due: **Fri, November 30, *before* 4:50pm**

Instructor: Patrick Bloom
E-mail: pbloom@ucsd.edu

1 Horizontal Foreign Direct Investment

A domestic machinery monopolist faces no competition in the Home market but can sell to the world market at some price P^*. The monopolist's total costs are

$$\text{TC} = \tfrac{c}{2} \cdot Q^2,$$

and domestic demand is

$$Q_M^d = S - Sb \cdot P_M,$$

where $c = 1/150$, $S = 50,000$ and $b = 1/1,000$.

- Calculate, and depict in a price-quantity diagram, the *effective marginal revenues* of this monopolist, considering the exporting opportunity.
- Calculate, and depict in a price-quantity diagram, the optimal amount of goods that the monopolist will choose to sell to the domestic market and the optimal amount of goods the monopolist will export in the absence of transport costs.
- Now suppose there are transport costs $\tau = \frac{1}{2}c$ per unit shipped across borders. Calculate and depict monopoly profits from exports. [*Hint:* Note that, in contrast to the case in class, these transport costs will shift and not turn the parent company's marginal cost curve for exported goods. A useful alternative way to approach the problem is to shift down the foreign price by the transport cost.]
- Alternatively, the monopoly can open a foreign subsidiary and sell to the world market from the new location at no transport cost. Calculate and depict profits at the foreign subsidiary. If there are some fixed costs to open a foreign subsidiary, how large can they be at most to make horizontal FDI worthwhile?

2 Vertical Foreign Direct Investment

A domestic machinery monopolist faces no competition in the Home market and a domestic demand function

$$Q_M^d = S - Sb \cdot P_M,$$

where $S = 50,000$ and $b = 1/1,000$.

The monopolist has three choices to make or buy its product for the domestic market.

1. To produce at the Home establishment under a cost function

$$\mathrm{TC}_1 = \tfrac{c}{2} \cdot Q^2,$$

where $c = 1/150$.

2. To acquire a Foreign subsidiary and to produce at the foreign location under a cost function

$$\mathrm{TC}_2 = \tfrac{c^*}{2} \cdot Q^2,$$

where $c^* = c/2 = 1/300$.

3. To enter a contract with Foreign suppliers but facing hold-up costs so that the effective cost function of Foreign supplies including *hold-up costs* becomes

$$\mathrm{TC}_3 = \tfrac{4c^*}{3} \cdot Q^{\frac{3}{2}},$$

where $c^* = c/2 = 1/300$.

There are transport costs $\tau = \frac{1}{2}c^*$ per unit shipped across borders. There are no fixed costs.

- Provide an example of a hold-up problem that deters a foreign supplier from supplying the right quality to the monopolist.
- Calculate, and depict in a price-quantity diagram, the marginal revenues of the domestic monopolist.
- Calculate, and depict in the price-quantity diagram, the marginal costs of the domestic monopolist under the three alternative make-or-buy choices.
- Calculate and depict quantities under the alternative make-or-buy choices. Which of the three choices is profit maximizing? Why? Depict profits.
- Depict a measure of the internalization advantage.

3 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?

4 Import Tariffs and Export Promotion in World General Equilibrium with a Large Country

A large 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 large country, consistent with the above assumptions.
- Suppose the large country 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 large country's production pattern change? How will the large country's consumption and trade pattern change? How is welfare affected?
- Suppose the large country 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 country's production pattern change? How will its consumption and trade pattern change? How is welfare affected? Is there a difference to the import tariff?

5 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.

6 Export Promotion in Partial Equilibrium

Consider the two countries from question 5 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.

7 Political Economy of Trade

As opposed to the findings of Magee (1980) for the tariff reforms in US Congress in 1973, Baldwin and Magee (2000) identify the following contributions and voting patterns in 1993 and 1994.

	Congressional votes	
	For NAFTA 1993	For GATT 1994
Actual votes	*229*	*283*
Predicted by model	229	290
Absence of labor contributions	+62	+56
Absence of business contributions	−34	−33
Absence of any contributions	+27	+33

Baldwin and Magee (2000)

- Is this evidence for or against the Stolper-Samuelson theorem?
- Is Heckscher-Ohlin trade theory supported? If not, what would voting patterns have to look like?

- Is the Specific Factors model (Ricardo-Viner trade theory) supported? If not, what would voting patterns have to look like?
- Discuss in what regards the results of Baldwin and Magee (2000) stand in contrast to those of Magee (1980).