

**14.54 International Economics**  
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**Problem Set 3**

**1. The Transfer Problem**

Suppose that Home (e.g. US) and Foreign (e.g. Germany) countries were at war for the past years and that Home has just won the war. Now, the two countries are fighting over war reparations. The home country argues that Foreign should pay an amount  $T$  to him and that there won't be any other costs to the Foreign economy. However, Foreign argues that there would be other costs in the form of a terms of trade effect. In order to find out who is right and who is wrong, let's solve the following problem:

Preferences for the Home country are

$$\alpha \log x_C + (1 - \alpha) \log x_F$$

Preferences for the Foreign country are

$$(1 - \alpha) \log x_C^* + \alpha \log x_F^*$$

The Home income is the value of its endowment plus a transfer  $T$ . And the foreign income is the value of their endowment plus a transfer  $T^*$  (which could be negative). The endowments of each good are the following:

$$e_C = 1, e_F = 0$$

$$e_C^* = 0, e_F^* = 1$$

Assume that

$$\alpha = \frac{1}{2}$$

You should use the good C as the numeraire good by assuming that  $p_C = 1$ .

1. First, assume that there are no transfers, so that  $T = T^* = 0$ . Calculate the new terms of trade, the relative world demand and relative world supply in the free trade equilibrium. Draw a supply and demand graph and show this equilibrium.

2. Now suppose the Foreign country transfer  $T^* = 0.25$  to the Home country. Calculate the new relative world demand, and relative world supply after the transfer. Is there any effect on the terms of trade? Is the Home country better off? If this was the case, who would have won the argument

above?

Now assume that

$$\alpha = \frac{2}{3}$$

3. Again, suppose the Foreign country transfer  $T^* = 0.25$  to the Home country. Calculate the new terms of trade, relative world demand, and relative world supply after the transfer. Is there any effect on the terms of trade? Is Home better off? Who would have won the argument above?

4. Would it be possible for the Home country to be worse off and the Foreign country to be better off after the transfer? Explain (you should mention the income effects).

## 2. Transfers and Migration

Imagine you are analyzing the post-unification economies of East and West Germany. It is a realistic assumption that they didn't trade before reunification and there was no migration allowed.

1. Given the relative factor abundance of these two countries what should have happened to wages after reunification, given that migration was not allowed? You probably observed that migration happened. Why do you think migration happened? What assumptions in the model you used to answer the first question don't hold in this setting?

2. West Germany made large transfers to East Germany after reunification. What should be the effect of these transfers. Under which conditions should they make the receiving country, East Germany, better off?

## 3. Tariffs and Quotas

In a small country the market for cars is described by the following demand and supply equations:

$$Q^D = 200p^{-1.2}$$

$$Q^S = 1.3p$$

where quantities are in millions and prices are in thousands of dollars.

1. What is the autarky price for cars,  $p^A$ , in this country?

2. Imagine the price of cars on the international market is  $p^W = 9$ . At this price how much would the country produce, how much would it demand and how much would it import?

3. Imagine the country imposes a quota for the import of cars. The government establishes that 1 million cars can be imported into the country.

What is the amount of cars supplied and demanded under this regime?

4. Find the tariff that would yield exactly the same level of imports as established in part 3. Assume this tariff is on the form:  $t$  dollars per car.
5. Draw a graph that represents the autarky equilibrium, the free trade equilibrium and the two equivalent restricted trade equilibria.
6. Quantitatively assess welfare under the three regimes: free trade, import quota and tariff, under the assumption that the government doesn't auction off the quotas, but randomly assigns them to foreign countries. Calculate consumer surplus, producer surplus and government revenues under the three regimes and then compare welfare loss due to the two types of trade restriction.

#### 4. Growth and Trade

Take two countries, Home and Foreign, that have different relative endowments of the two factors of production, capital and labor. These two factors are used in the production of two goods, airplanes, which use relatively intensively capital and textiles, which use labor relatively intensively. Assume that the Home country is relatively better endowed with capital than labor with respect to the Foreign country.

Describe qualitatively and draw the appropriate graphs to illustrate the impact on the two countries' terms of trade and welfare of the following growth patterns:

1. Increase in the capital stock in the Home country
2. Increase in the labor supply in the Home country
3. Increase in the capital stock in the Foreign country
4. Increase in the labor supply in the Foreign country

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