

Exercise set 4. Assignment 1

**Objective:** This exercise set consists of four assignments which are designed to illustrate the economic and welfare implications of trade liberalization and trade policy intervention, both in a partial and general equilibrium context. In solving for the equilibrium solutions, students are expected to apply various trade concepts and economic principles introduced in class and in the readings.

**Problem of this assignment:** Given the market information below, use a partial equilibrium, 2-country model to show how price differences motivate international trade and affect economic change. Assume that the good in question (say meat) is identical in both countries, there are no transportation or other marketing costs, there is no government policy or domestic regulations that serve as a barrier to trade, and that the good is denominated in one currency (no exchange rate issues).

Suppose that the internal markets for agricultural products in North and South, respectively, are expressed mathematically as in the table below.

North's Agricultural Market	South's Agricultural Market
$D_A: Q_A = 900 - 10 P_A$	$D_A: Q_A = 1000 - 5 P_A$
$S_A: Q_A = -150 + 15/2 P_A$	$S_A: Q_A = 650 + 25/2 P_A$

1.1. *Step 1.* Solve for the closed market (autarky) equilibrium in the agricultural sector of North and South to determine the internal price,  $[P_A]^*$ , and quantities supplied,  $[Q_S]^*$ , and demanded,  $[Q_D]^*$ . Note: the solution will be of use in the subsequent assignments.

**Pre-trade partial equilibrium**

North's agricultural market					South's agricultural market				
$[P_A]^*$	$[Q_S]^*$	$[Q_D]^*$	$[Q_T]$	$V_T$	$[P_A]^*$	$[Q_S]^*$	$[Q_D]^*$	$[Q_T]$	$V_T$
			0	0				0	0

1.2. *Step 2.* Identify the net agricultural importer and exporter from the pre-trade equilibrium prices. Derive excess demand (ED) of the importer and excess supply (ES) of the exporter.

Excess demand function	Excess supply function
$ED_A =$	$ES_A =$

1.3. *Step 3.* Solve for the free trade equilibrium (equate  $ED_A$  and  $ES_A$ ). Determine the world price,  $[P_A]_w$ , quantity traded,  $Q_T$ , the value of trade,  $V_T$ , and the new domestic market situations in each country, i.e.,  $[Q_S]_1$  and  $[Q_D]_1$ .

**Free trade partial equilibrium**

North's agricultural market					South's agricultural market				
$[P_A]_w$	$[Q_S]_1$	$[Q_D]_1$	$[Q_T]$	$V_T$	$[P_A]_w$	$[Q_S]_1$	$[Q_D]_1$	$[Q_T]$	$V_T$

1.4. *Step 4.* Construct a 3-panel diagram to show the market changes from pre- to free trade.

- 1.5. Submit answers to the following questions and be prepared to discuss them in class.
- 1.5.1. How do the results under 1.3 and 1.4 relate to the law of one price? What is arbitrage and how does this concept apply in this case?
  - 1.5.2. Suppose the good is frozen meat and that to trade meat there is fixed transportation cost per unit (kr/kg). At what cost per kg would transport costs prohibit trade?
  - 1.5.3. How does a transportation cost of 6 kr/kg affect prices and the volume of trade?
  - 1.5.4. What determines how much of the transportation costs are borne by the exporter and importer? Why does this make sense?
  - 1.5.5. Do the transportation costs affect the general lesson of international trade? Explain in terms of the law of one price?
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