ECN 230 The Economics of International Trade Autumn 2008

Problem set 4

Objective: This problem set is designed to illustrate the economic implications of an export subsidy both in terms of the partial equilibrium effects and some expected general equilibrium effects. In addition, you are expected to apply various concepts introduced in class.

Problem: Suppose the internal agricultural markets of a net importing and a net exporting country are described by the following systems of equations. Given the two-country information, solve the partial equilibrium solution. Although you are only solving a partial equilibrium solution, you are also asked to provide a potential general equilibrium solution if there were a manufacturing sector that competed for resources with the agricultural sector.

Exporter's agricultural market	Importer's agricultural market
ES_A: $Q_A = -350 + 35/2\ P_A$	ED_A: $Q_A = 1283.33 - 70/3\ P_A$
S_A: $Q_A = 800 + 5\ P_A$	

4.1. Use a partial equilibrium framework (i.e., 3-panel diagram) to represent the three agricultural goods markets: the internal markets of the importer and exporter, and the world market. Note: sketch the importer's internal market because information is incomplete. Step 1. Solve for the world price, $[P_A]_W$, quantity traded, $[Q_A]_T$, and the value of trade, $[V_A]_T$.

4.2. Step 2. Then determine the initial quantities supplied, $[Q_A]_0$, and demanded, $[C_A]_0$, in the exporting country using the world market information.

4.2 Free trade equilibrium in the agricultural sector from exporter's perspective					
$[D_A]_S$ =					
$[P_A]_D$	$[P_A]_W$	$[Q_A]_0$	$[C_A]_0$	$[Q_A]_T$	$[V_A]_T$
5.3. Equilibrium under the trade policy regime from the exporter's perspective					
Solve for the new excess supply function					
$[ES_A]_1$ =					
$[P_A]_D$	$[P_A]_W$	$[Q_A]_1$	$[C_A]_1$	$[Q_A]_T'$	$[V_A]_T'$

4.3. Now, suppose the government in the exporting country offers a specific subsidy of 11.66 per unit. Ignore the possibility for retaliation. Step 3. Solve for the new excess supply function with the subsidy. Step 4. Determine the new equilibrium quantities supplied and demanded in the exporting country by solving for the domestic price, $[P_A]_D$, the new world price, $[P_A]_W'$, and quantity and value traded, $[Q_A]_T'$ and $[V_A]_T'$.

4.4. For the exporting country, analyze the welfare effects of the export subsidy relative to the free trade equilibrium solution. Identify the areas in your partial equilibrium model that represent the welfare changes in consumer surplus, ΔCS, producer surplus, ΔPS, change in government revenue or budgetary expenditures, ΔG, and the net social welfare, ΔNSW. Compare the welfare estimates to a measurement of the consumer and producer subsidy equivalents, CSE and PSE, respectively. Explain the difference if the value of the measurements. What would be the change in NSW in the world? Explain.

	Welfare analysis	Subsidy equivalent measurements	Change in NSW in the world
ΔCS			
ΔPS			
ΔG			
ΔNSW			

4.5. Use the partial equilibrium results to conclude directional changes in production, consumption and trade in the exporting country's economy in a general equilibrium setting. Assume a two-sector economy, agriculture and manufacturing under the assumptions presented and discussed in class. Note: you only have solved a partial equilibrium problem in the agricultural sector. Deduce the trade effects on the international manufacturing market given the information you have about changes in relative price of the agricultural good (i.e., P_A relative to P_M). To do this, use the offer curve analysis to show (1) the initial equilibrium of quantity trade, $[Q_A]_T$ for $[Q_M]_T$, (2) the initial terms of trade, TOT, (3) the new equilibrium quantity traded, $[Q_A]_T'$ for $[Q_M]_T'$, and (4) the new terms of trade, TOT_1.

Optional: a more advanced general equilibrium solution would be the use of the H-O-S framework. Relying on the use of the H-O-S model, show the general equilibrium result of the subsidy on trade on production, consumption, trade and welfare in the exporting country.