

ECG 742 Homework problem: the effects of changes in transport costs

Due in class on Tuesday, March 2nd.

India exports sugar to the European Union. One metric ton (tonne) of sugar loaded in India plus one unit of transport services from India to the EU results in one tonne of sugar in Europe, where it is consumed.

1. In an initial competitive equilibrium, 5 million tonnes are shipped at a price received in India of 300 U.S. dollars per tonne. The price of sugar in Europe is 500 U.S. dollars per tonne. The supply of transportation services for sugar from India to Europe is perfectly elastic.

Suppose that the Covid-19 pandemic resulted in a 40% increase in the price of relevant transportation services. Assume that the supply elasticity of sugar in India is 0.5 and that the demand elasticity for sugar in Europe is -2.0.

In this scenario, what are the effects of the pandemic on the quantity exported, the price of sugar in India, and the price of sugar in Europe? Calculate the losses to European consumers and to Indian producers.

2. Analyze the same problem as in part 1, but relax the assumption that transportation services are perfectly elastically supplied to sugar exporters. Instead, assume that the elasticity of supply of the relevant transportation services is 4.0. The initial equilibrium quantities and prices are the same as assumed above. (Different from above) consider the effects of the pandemic to be a 50% increase in the marginal costs of providing transport services at any level of provision.

As before, analyze the effects of the pandemic “tax” on quantity exported, prices in Europe and India, and on the welfare of European consumers and Indian producers. Also calculate the effect on the welfare of the firms that provide transportation services.