

L Karp
Open economy microeconomics
August 9, 2008

Problem set 5

This exercise has three objectives. The first is to help make the Principle of Targeting second nature to you. Ask yourself “What is the quantity that I want to influence? What is the price (or set of prices) that I need to change in order to influence this quantity?” The second is to give you more practice working out equilibria and making comparisons using the by-now-familiar graphical construction. The third is to improve your understanding of the comparison between general and partial equilibrium models.

In some cases you may be able to “guess” the answer before using the graphs. In that case, the graphs merely provide a means of outlining a proof. In other cases, the graphs may actually help you to find the answer. In either case, you should be sure to work on the economic intuition for the answer. Don’t be satisfied with a mechanical demonstration of the answer.

Under free trade a small country imports food and exports cloth. The government has three policies¹:

- (i) A consumption tax / subsidy
- (ii) A production tax / subsidy
- (iii) A tariff / export tax

Case I. There is a non-economic constraint that consumption of food be less than or equal to F^* .

Case II. There is a non-economic constraint that the import of food be less than M^* .

Use the geometric two-good general equilibrium model with a production possibility frontier, indifference curves, and a balance of payments constraint. For each of the two cases:

a) Illustrate an equilibrium in which the constraint is violated in the absence of policy intervention.

¹ Spend a minute reminding yourself why I talk about a “tax/subsidy” rather than just a “tax” or a “subsidy”.

b) What is the optimal policy (i.e. which of the three instruments above should be used to achieve the objective)²? Show how the optimal policy affects consumption, production, trade and welfare. Find the level of the optimal policy.³

c) Show the welfare effects when the constraint is achieved using a sub-optimal policy.⁴

d) If growth can be immiserizing when the constraint is achieved using a sub-optimal policy, provide an example. If you conclude that growth cannot be immiserizing for a particular second best policy, demonstrate your conclusion and explain it.

For parts (b) - (d) provide a couple of sentences of explanation to go with your graphs. (Be brief.)

e) Answer all of the previous problems in a partial equilibrium setting, i.e. a supply and demand model in which income is held constant. Compare the answers you get, and comment on the difference between the general and partial equilibrium setting (i.e. the role of the assumption -- in the partial equilibrium setting -- that income remains constant).

²In answering this question you are allowed to use only one policy: only a production policy, only a consumption policy, or only a trade policy. You are not allowed to combine two policies, such as a production and a consumption policy. If you were allowed to combine two policies, how would your answer change?

³ Here's how you find the level. You know that the slope of one line equals world price, and the slope of another line equals the domestic (producer or consumer) price. A relation between these two slopes determines the equilibrium tax/subsidy. I want you to tell me exactly what the relation is.

⁴ For example, if you decide that the production policy is the first best policy, I want you to show the welfare effect when the constraint is achieved using a consumption policy and then do the same using a trade policy. Note that some circumstances it might not be feasible to achieve the constraint by means of a sub-optimal policy. It is worth your while to identify such a circumstance.