

Intermediate Micro In-Class Problems

Trade & Market Demand

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Zedong and Enlai are particularly well-endowed. Zedong has been blessed with 3 tons of rice, while Enlai is in possession of 4 heads of pork.

We will explore the natural (and full-information) result of bartering/trading between Zedong and Enlai, given that both of them like both pork and rice.

1 Endowments

What does it mean to have an endowment of goods? Does this endowment make us rich?

Without having some shared and inherent value attached to either/both of these goods (rice/pork), each will rely on the market to provide them with prices by which they can value their *ex ante* basket of goods. Then we'll show that, given each person's preferences for both goods, prices for each will emerge naturally and facilitate trade.

1.1 Invisible Hand I

Suppose that the price of a ton of rice, p_r , were ¥5, while that of pork, p_k , is ¥2.

What is Zedong's effective income under these prices? That is, how much cash would he have if he sold all of his goods to the market and took the money home?

What about Enlai?

1.2 Budgets

Draw budget lines for both Zedong and Enlai given these prices and their endowments.

1.3 Anticipation Pause

We are now in a situation similar to one we've found ourselves in before. We clearly want to find each person's demand under these prices. What are we

missing? What is currently preventing us from answering the question “How much of each good does Zedong want?”

2 Preferences

2.1 Simple Preferences

Suppose Enlai’s preferences were given by $u_E(r, k) = r$. What would be his demanded bundle?

2.2 Cobb-Douglas

Let’s instead impose more commonplace preferences on our enterprising pair. We’ll denote Zedong’s preferences with u_Z :

$$\begin{aligned}u_Z(r, k) &= .3 \ln r + .7 \ln k \\u_E(r, k) &= .8 \ln r + .2 \ln k\end{aligned}$$

2.2.1 Eyeballing Demand

Take a good look at both individual’s preferences. Who likes pork more? Who likes rice more?

2.2.2 Calculating Demand

Find both Zedong’s and Enlai’s demand given their preferences, their endowments, and the stated prices above.

2.3 Correct Prices?

Note that Zedong and Enlai are the only sources of pork and rice in the world. Are these prices correct?

To put it another way, is there any way for Zedong and Enlai to trade away portions of their endowment and achieve the desired demand of both parties?

If Zedong and Enlai put all of their pigs in a pen and tried each to take his demanded quantity of pigs, what would happen?

3 Market Clearing

The reason the prices didn’t work above is that they led to an over-supply of one good and an under-supply of the other.

Which price should go up? Which should go down?

3.1 Market Clearing Condition

We'll use the fact that markets must clear to determine what the prices of rice and pork must be.

Write two equations which encapsulate the fact that markets must clear. What must be the total consumption of rice?

3.2 Invisible Hand II

Let the prices be unknown: p_r and p_k are now variables.

3.2.1 Variable Accounting

We now have 6 unknowns. What are they?

3.2.2 Equation Accounting

To solve for 6 unknowns, we generally need 6 equations relating them. Indeed we have this many. What are they?

3.2.3 Solving

What are the market clearing prices of pork and rice? What are the final allotments of the two goods?

Do they make sense, given what we know about preferences and endowments?