Sample Problem: Chapter 3

Discussion on Factor Earnings in the SFM

Suppose the payments to labor and capital in manufacturing and agriculture are given by the following:

Manufacturing:

Sales revenue =PM \* QM = $100

Payments to labor = W \* LM =$60

Payments to capital = RK \* K = $40

* 60% of the sales revenue in M sector goes to the workers, and 40% goes to the capital owners.

Agriculture:

Sales revenue = PA \* QA = $100

Payments to labor = W \* LA = $50

Payments to land = RZ \*Z = $50

* 50% of the sales revenue in A sector goes to the workers, and 50% goes to the land owners.

Now assume that the increase in the relative price of manufactures, PM / PA, is because of a rise in PM, holding PA constant.

Suppose the following price changes:

Manufacturing: Percentage increase in price = ΔPM / PM = 10%

Agriculture: Percentage increase in price = ΔPA / PA = 0%

Percentage increase in the (nominal) wage = ΔW / W = 5%

* Percentage increase in the (nominal) wage is between the percentage change in these two industry prices
* Also note that, the increase in nominal wage applies in both sector since nominal wages are equalized across sectors, that is, (ΔW/W) < (ΔPM / PM )

Q1. Calculate the percentage change in the Rental on Capital

Step 1. Rental on capital = RK = (PM \* QM - W \* LM )/ K

Step 2. Change in Rental on capital = Δ RK = (ΔPM \* QM - ΔW \* LM )/ K

Step 3. Percentage change in Rental on capital = (ΔRK / RK)

= ((ΔPM / PM ) PM \* QM - (ΔW/W) W \* LM )/ RK \* K

Step 4. Substituting the information above gives, (ΔRK / RK) =( 10% . 100 – 5% . 60) / 40 = 17.5 %

We get that the percentage increase in the rental on capital, 17.5%, is far greater

than the percentage increase in the relative price of manufacturing, 10%.

* (ΔRK / RK) > (ΔPM / PM )

Q2. Calculate change in the Rental on Land

Step 1. Rental on land = RZ = (PA \* QA - W \* LA)/ Z

Step 2. Change in Rental on land = Δ RZ = (ΔPA \* QA - ΔW \* LA )/ Z

Step 3. Percentage change in Rental on land = (ΔRZ/ RZ)

= ((ΔPA / PA ) PA \* QA - (ΔW/W) W \* LA )/ RZ \* Z

Step 4. Substituting the information above gives, (ΔRZ/ RZ) =( 0% . 100 – 5% . 50) / 50 = - 5 %

We get that the percentage change in the rental on land, -5%, is less than 0 and less than the percentage increase in the nominal wage, 10%.

* (ΔRZ/ RZ) < (ΔPA / PA ) = 0% < (ΔW/W)

Q3. Write down the general equation for the change in factor prices.

* (ΔRZ / RZ) < 0% < (ΔW/W) < (ΔPM / PM ) < (ΔRK / RK), for PM  ↑

Q4. If, instead of the situation given in problem 1-3, the price of agriculture was to rise, keeping PM constant, would landowners or capital owners be better off? Explain.

If the price of agriculture was to rise, the situation would be reversed such that landowners would be better off as the rental on land rises. Capital owners would be worse off because the rental on capital would fall.

* (ΔRK/ RK) < 0% < (ΔW/W) < (ΔPA/ PA ) < (ΔRZ / RZ), for PA ↑

Note that:

These general equations show that the specific factor in the sector whose price has increased gains, while the specific factor in the other sector loses. Moreover, the factor “caught in the middle,” namely labor, gains on one hand in terms of its ability to purchase one good and loses in terms of the other.

* Therefore, the general conclusion of the Specific Factor Model is:

An increase in the relative price of an industry’s output will increase the real rental earned by the factor specific to that industry but will decrease the real rental of factors specific to other industries.

* In other words, the factors specific to the export industries are winners when an economy engages in trade whereas the specific factors used in import industries are losers following the fall in the relative price of imports.

Reference

Feenstra, R. and Taylor, A. (2014). *International Trade*  (3rd ed.). United States: Worth Publishers.