



Problem Set #4: Due end of class November 2, 2017

You may discuss this problem set with your classmates, but everything you turn in must be your own work.
Please read the “problem set guidelines” on the course web page before beginning.

1. Use the two-country model of vertical FDI we developed in class to answer the following questions. Assume that $\theta_{au} = 5$, $\theta_{as} = 1$, $\theta_{bu} = 1$, $\theta_{bs} = 10$, $w_u^1 = 10$, $w_s^1 = 20$, $w_u^2 = 2$, $w_s^2 = 30$, $\tau_b = 0.06$, and $\tau = 0.05$.
 - a. What is the optimal firm structure? Show your calculations.
 - b. Suppose economic development in country 2 increases the unskilled wage rate to $w_u^2 = 4$. What is the optimal firm structure? Show your calculations.
 - c. How large does w_u^2 need to be for the firm to prefer exporting to partial fragmentation? Show your calculations.
 - d. Would your answer to part c. increase or decrease if, leaving all the other parameters unchanged, τ decreases 0.02? Explain your reasoning. You do not have to recalculate part c., but you may if it helps.
2. Since 2001, Chinese wages have been growing at about 12 percent per year. How would you expect the types of foreign direct investment into China to change? Use the model of vertical FDI to frame your answer.
3. In 1997, chipmaker Intel opened a microprocessor testing and assembly facility in Costa Rica. Fabrication plants in other countries produce the extremely capital and skilled-labor intensive silicon wafers and other parts, which are shipped to Costa for assembly and testing. Once complete, the microprocessors are exported to the world market. How are other firms in Costa Rica likely to be affected by productivity spillovers from Intel’s investment? Explain your answer.

True/False-Explain. Respond to the following statements by *explaining why they are true or false*. No partial credit will be awarded for stating TRUE or FALSE without explanation.

4. The fixed-proportions (or Leontief) production function, with unit requirements θ_k for capital and θ_ℓ for labor, has the cost function

$$c(r, w) = \frac{r}{\theta_k} + \frac{w}{\theta_\ell},$$

where r is the rental price of capital and w is the wage.

5. In February 2016, Indonesia announced plans to open its waste management industry to foreign investment; Waste management firms may now be 100 percent foreign owned. Even if foreign direct investment does not bring “spillovers” we would expect to see the Indonesian waste management industry become more productive.