Practice Final Exam

Do not open this exam until instructed to do so.

- You have 110 minutes to complete this exam
- You may use a calculator; you may **not** use any other device (cell phone, etc.)
- You may consult one page of notes (both sides); you may not use books, notebooks, etc.
- Show your work

I will not lie, cheat, or steal to gain an academic advantage, nor will I tolerate those who do.

_____

Signature

_____

Printed Name

True/False-Explain. Respond to the following statements by *explaining why they are true or false.* For each statement, a complete and correct explanation is worth 10 points. No partial credit will be awarded for stating TRUE or FALSE without explanation.

1. (10 pts.) Legal services, compared to a patent for a production process, are less likely to be licensed to an unrelated firm.

2. (10 pts.) When firms cannot write enforceable contracts, and have to bargain ex post over the proceeds from production, joint profit is maximized, but the division of the profit is not.

3. (10 pts.) The production function for good y is $y = Am^{\alpha}$. If good y sells for p_y and good m costs the firm p_m to procure, the firm uses $m = [p_m/(\alpha p_y A)]^{1/(\alpha-1)}$ if it maximizes its profit.

4. (10 pts.) A British multinational earned \$200 in the United States and \$400 in the United Kingdom. The corporate tax rate in the United States is 40 percent and the corporate tax rate in the United Kingdom is 25 percent. The U.K. government offers its multinationals a foreign tax credit. The total tax owed to the U.K. government is \$100.

5. Bessemer technologies owns a patent for producing a particular steel alloy. When one unit of inputs m are used in production, the technology produces revenues R. If Bessemer produces the inputs, it pays γp_m to do so.

   Bessemer could license the patent to a firm in France. If it does, it pays T in each period to transfer the patent and f to provide technical support. In return, Bessemer receives license payments L_t and L_{t+1}. In period $t+1$ the licensee has learned how to create the alloy. If it chooses to produce without the Bessemer patent, it pays f^S to support its technology.

   Use the two-period licensing model that we developed in class to answer the following questions. Assume that $R = 6$, $\gamma = 1.4$, $f = 1.1$, $f^S = 1.6$, $T = 0.2$, $r = 0.03$, and $p_m = 1$.

   a. (6 pts.) What profit does Bessemer earn if it produces m for its own use? Assume Bessemer has access to financial instruments that pay return $r = 0.03$.

   b. (8 pts.) Suppose Bessemer licenses the technology to a French firm that has access to financial instruments that pay return $r^S = 0.03$. There were several firms bidding for the patent, so Bessemer is able to demand a license agreement that results in $\pi_S = 0$ for the licensee. What are the license payments?

c. (3 pts.) Should the firm license to the French company? Why?

d. (8 pts.) Bessemer is offered a second opportunity to license its technology, this time to a firm in Argentina. The interest rate in Argentina is $r^S = 0.2$. Compute the license payments.

e. (5 pts.) Explain the economic intuition behind the difference in the license payments from the French firm and the Argentinean firm.

f. (3 pts.) Should the firm license to the Argentinean company? Why?

6. Consider a final good firm that owns the final good technology $q = Am^{\alpha}$. The final good sells for price p. If the final good firm chooses to make the intermediate good m, if pays a fixed cost f^I and it costs $p_m\gamma$ per unit. A specialized supplier can produce the intermediate good for price p_m per unit. Due to enforcement problems, the two firms cannot write a contract that governs the price and quantity of m. Use the outsourcing/hold-up model that we developed in class to answer the following questions.

   a. (8 pts.) If $\alpha = 0.5$, $A = 0.4$, $p_m = 1.1$, $p = 1.5$, $\beta = 0.7$, $\gamma = 1.3$, and $f^I = 0.25$, what are the profits of the final good firm if it produces the intermediate good in-house?

   b. (8 pts.) If $\alpha = 0.5$, $A = 0.4$, $p_m = 1.1$, $p = 1.5$, $\beta = 0.7$, $\gamma = 1.3$, and $f^I = 0.25$, what are the profits of the final good firm if it outsources to the supplier firm and the two firms bargain after production of the intermediate good?

   Assume that the supplier has bargaining power β and the final good firm has bargaining power $1 - \beta$.

c. (5 pts.) Would the firm be more, or less, likely to integrate if A increased? Explain your answer.

7. (6 pts.) The corporate tax rate in Mexico is 25 percent and the corporate tax rate in Peru is 18 percent. A multinational firm ships an intermediate good from its headquarters in Mexico to its affiliate in Peru. The intermediate good is assembled into a finished product which is sold in Peru. The intermediate good price is a transfer price: The good was "sold" from one unit of the firm to another. Would the firm like to set the transfer price relatively high or low? Explain your answer.

Cumulative Mini-exam

The next two questions are short answer questions. Your answers should be no more than six or seven sentences.

8. (10 pts.) What kind of foreign direct investment is complementary to international trade? By complementary, we mean more FDI leads to more international trade. Explain your answer.

9. (10 pts.) Multinational firms are larger and more productive than their domestic counterparts. Provide an explanation for this fact. You may want to use a model we have developed in class to frame your answer.

10. Should a firm export or build a foreign affiliate to serve a foreign market? In this question, we will use the two-country, heterogenous-firm model to study the firm's decision. A firm in the United States would like to serve two foreign markets: Canada and France.

    In the two countries, expenditures are $E_C = E_F = 500$; the elasticities of demand are $\epsilon_C = \epsilon_F = 4$; and wages are $w_C = w_F = 1.6$. The ad valorem trade costs are $\tau_C = 0.02$ and $\tau_F = 0.15$. The wage in the United States is $w_U = 1.6$; the fixed cost of exporting is $f^e = 0.75$ and the fixed cost of producing is $f^p = 8$. The firm's productivity is $\varphi = 2$.

    a. (5 pts.) Should the firm export or use a foreign affiliate to sell to Canada? Show your work.

    b. (5 pts.) Should the firm export or use a foreign affiliate to sell to France? Show your work.

c. (10 pts.) What is the "proximity-concentration tradeoff?" Explain its role in a firm's choice over how to serve a foreign market. You may want to use your answers from parts a. and b. in your answer.

Extra Space

Clearly label the question number, and leave a reference to this page near the question.