Practice Exam 2

Updated 11/1 to correct typo in solution to 5d.

Do not open this exam until instructed to do so.

- You have 75 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.) Vertical foreign direct investment and international trade are complementary.

2. (10 pts.) Export platform FDI is not likely to generate many productivity spillovers through forward linkages.

3. (10 pts.) Goods x and y are produced using electricity (e) and labor (ℓ). The production function for good x is $x = \min\{\frac{\ell}{2}, \frac{e}{3}\}$. The production function for good y is $y = \min\{\frac{\ell}{1}, \frac{e}{3}\}$. Good y is labor-intensive.

4. (10 pts.) The government should never subsidize inward foreign direct investment.

5. Integrated oil and gas companies, like ExxonMobil, use extraction services (e) and refining services (r) to first produce crude oil (o) which is then refined into gasoline (g). The price of refining services is p_r and the price of extraction services is p_e. Consider two countries, the United States and Mexico. In the United States, $p_r^U = 1$ and $p_e^U = 4$. In Mexico, $p_r^M = 5$ and $p_e^M = 2$. The production functions for oil and gasoline are

$$o = \min\left\{\frac{e}{10}, \frac{r}{1}\right\}$$
$$g = \min\left\{\frac{e}{1}, \frac{r}{3}\right\}.$$

Use the model of vertical FDI that we developed in class to answer the following questions.

a. (5 pts.) If there are no costs to trading oil and gasoline, which country produces oil and which produces gasoline? Explain your answer.

b. (3 pts.) Write out the formula for the cost of gasoline in the United States and in Mexico when ExxonMobil chooses to completely fragment its production. Let τ_o be the cost of trading crude oil and τ_g be the cost of trading gasoline.

c. (3 pts.) Write out the formula for the cost of gasoline in the United States and in Mexico when ExxonMobil chooses to partially fragment its production. Let τ_o be the cost of trading crude oil and τ_g be the cost of trading gasoline.

d. (8 pts.) When the cost of shipping oil, τ_o, is 0.12 and the cost of shipping gasoline, τ_g, is 0.05, is partial fragmentation or complete fragmentation the optimal way to structure the firm? Explain your answer

e. (3 pts.) To spur job creation in the oil drilling industry, the U.S. Congress bans crude oil imports into the United States. What is ExxonMobil's new gasoline cost in the United States?

f. (7 pts.) To offset the higher price of crude oil in the United States, Congress will subsidize exports of gasoline to Mexico. In our model, a subsidy is a negative value of τ_g. What value of τ_g makes the cost of U.S.-refined gasoline exported to Mexico equal to the cost of gasoline produced entirely in Mexico?

6. Your firm has been hired by the Cyrodiilian government to advise them on a potential investment by high-tech Canadian power generater TransAlta.

   The Canadian firm would like to build several hydroelectric generating plants using equipment imported from Germany. TransAlta expects to staff the generating plants with local workers, but is concerned that the low college enrollments in Imperial City might make it difficult to find enough skilled labor.

   The TransAlta investment would mainly serve the Imperial City market, with a population of 8 million people. The power generation market in Cyrodiil is currently dominated by three local firms. Due to a mix of strategic pricing and poor infrastructure, electricity prices in Cyrodiil are 15 percent higher than in neighboring Hammerfell.

   a. (3 pts.) Why is TransAlta investing in Cyrodiil?

   b. (15 pts.) How would the investment affect firms in Cyrodiil? You may want to use the evaluative framework we developed in class to organize your answer.

7. Consider two versions of the vertical FDI model we developed in class. In both models, let $\theta_{au} = 5$, $\theta_{as} = 1$, $\theta_{bu} = 1$, $\theta_{bs} = 10$, $w_u^1 = 10$, $w_s^1 = 20$, $w_u^2 = 2$. In one version of the model, $w_s^2 = 30$ and in the other version, $w_s^2 = 35$.

   We can characterize the optimal firm structure in each model using the figures below.
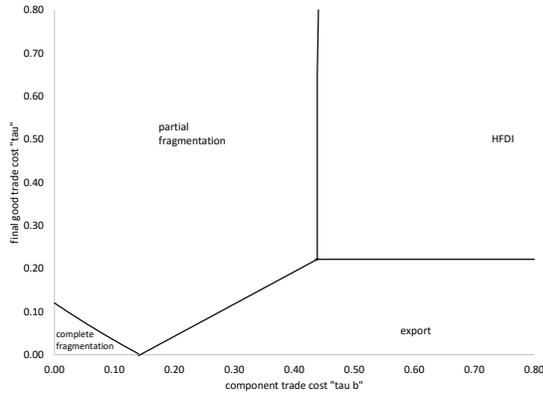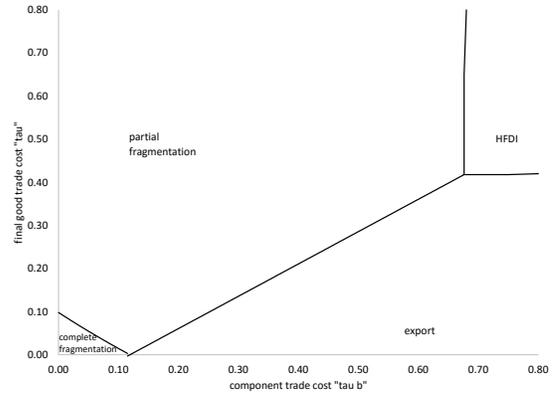
<table>
<tr><td align="center">Figure 1</td><td align="center">Figure 2</td></tr>
</table>

   a. (9 pts.) Which figure, 1 or 2, corresponds to the model in which $w_s^2 = 35$? Explain your answer.

b. (2 pts.) Suppose, in the model represented by Figure 1, $\tau = 0.5$ and $\tau_b = 0.5$. What happens to inward FDI in country 2 when a trade agreement lowers tariffs to $\tau = 0.2$ and $\tau_b = 0.2$?

c. (2 pts.) Suppose, in the model represented by Figure 2, $\tau = 0.5$ and $\tau_b = 0.5$. What happens to inward FDI in country 2 when a trade agreement lowers tariffs to $\tau = 0.2$ and $\tau_b = 0.2$?

Extra Space

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