

ECO 300 – MICROECONOMIC THEORY
Fall Term 2005
PROBLEM SET 6
Due 12.30 p.m. on Thursday December 1

QUESTION 1: (Total 10 points)

Pindyck-Rubinfeld, Chapter 9, Exercise 13 on p. 335. Assume that the labor market is perfectly competitive. Note that all amounts of these taxes are calculated as percentages of the pre-tax or gross-of-tax wage paid by the employer to the worker. If an employer pays an employee an amount W gross of taxes over a year, then each of the employer and the employee pays to the IRS $0.062 W$. The proposed change would have the employer paying to the IRS $0.124 W$ and the employee paying nothing. Also in practice this applies only when W is less than a ceiling that changes from one year to the next; if W exceeds the ceiling, then the taxes are calculated on the ceiling. Ignore this feature.

QUESTION 2: (Total 35 points, 7 for part a and 14 each for parts b, c)

Pindyck-Rubinfeld, Chapter 9, Exercise 11 on p. 335.

QUESTION 3: (Total 35 points)

In the days before amazon.com and other internet booksellers went worldwide, textbook publishers used to price their books differently in different countries. Now students can order their books from the site in the country with the lowest price. (They must compare the prices inclusive of shipping costs, but these are small relative to the prices of the books so we will ignore them in this question.) Therefore publishers are re-thinking their pricing strategies. Imagine that you are a consultant trying to assist them!

Focus on one textbook, say Mezzoeconomics by Robdyck and Danfeld. It costs the publisher, Megatext, \$18 to print and supply each copy to the bookseller. In addition, Megatext pays the authors a royalty equal to 10 percent – this is 10 percent for the two authors together; each gets 5 percent – of the price it charges to the bookseller. So if P is this price, Megatext's cost per book is $18 + 0.1 P$. (Note the slightly unusual feature: the cost itself depends on the price.) The booksellers are highly competitive, so ignore their margins and suppose the price they charge to the consumers (students) is P .

(a) First consider the time before any cross-country internet sales could occur. Suppose there are two separate markets, US (labeled U) and Europe (labeled E). Denoting prices and quantities by P and Q respectively, the demand functions are

$$Q_U = 700 (160 - P_U) , \quad Q_E = 300 (80 - P_E)$$

Calculate the expressions for the numerical values of the price elasticities of demand in the two markets, in each case as a function of the price in that market. If the prices were equal, which market would have the more elastic demand?

(b) Write down the expressions for Megatext's profit in each market as a function of the price in that market? What are the separate optimal (profit-maximizing) prices for the two markets? What is Megatext's total profit on this book from the two markets? What are the authors' royalties?

(c) Now suppose the advent of worldwide internet sales makes it impossible for Megatext to maintain separate prices in the two markets. Find an expression for Megatext's total profit as a function of the common price P it charges in the two markets. What is the optimal (profit-maximizing) price? What is Megatext's resulting profit? What are the authors' royalties?

(d) Who gains and who loses from this integration of the worldwide book market? Quantify the students' gains or losses as the appropriate consumer surplus changes.

QUESTION 4: (Total 20 points)

Re-do the airline pricing example from pp. 9-10 of the lecture overheads handout of November 15, with the sole difference that the numbers of the two types of travelers (tourist and business) are 50 each, instead of 30 and 70.

(a) (5 points) Calculate the maximum profit that PITS can make if it can identify each individual traveler's type and practice perfect price discrimination.

(b) (10 points) If PITS cannot identify each individual traveler's type, calculate its profits from following each of the five types of strategies that were considered in the class example.

(c) (5 points) What is now the profit-maximizing strategy for PITS? What is the economic intuition for the difference between this answer and that in the class example?