

ID No. _____

Essay Exam For Economics Comprehensives, 2009

This exam is mostly based on Kathryn Graddy, (2006) “Do Fast-Food Chains Price Discriminate on the Race and Income Characteristics of an Area?” *Journal of Business and Economic Statistics*, 15(4):391-401. The Adobe Acrobat version of the paper is searchable. Point values are given in parentheses—the entire exam is worth 150 points.

You will probably want to write part of the exam on paper and part in the Word version of this exam. On the paper copy please indicate which questions are in the Word document.

Please save this file to your folder as

EmpiricalCompsYourNumber.doc.

For example if your number is 2, save the file as EmpiricalComps02.doc. If your number is 16, save the file as EmpiricalComps16.doc.

Part 1: Macro Theory

1. (20) The article you read focuses on price discrimination and includes income characteristics of households in estimation. While the distribution of income is important in determining the income characteristics of households (such as the proportion of the population below the poverty line or income level used in the study), the aggregate income level as measured by real GDP is another important determinant. In general, measures of economic policy affect aggregate income (and therefore disposable income of households) in the short run.

Consider the following quote from *The New York Times* (01/25/2008): "Hoping to give a quick adrenaline shot to the ailing economy, President Bush and House leaders struck a deal on Thursday for a \$150 billion fiscal stimulus package, including rebates for most tax filers of up to \$600 for individuals, \$1200 for couples and, for families, an additional \$300 a child." Draw an appropriate AD-AS graph and explain what was likely to happen to aggregate real income as a consequence of this measure. (Assume that the proposed economic policy measures do not alter the distribution of income in any significant way.)

(b) (10) What if the publisher decides instead to *combine* the two markets and set a single price for the book. Show that the profit-maximizing price will be \$17 and the profit-maximizing quantity will be 6.5 million. Show your work and draw a diagram that illustrates the solution. (Hint: your demand and marginal revenue curves will have “kinks” in them.)

(c) (5) Profit for the non-discriminating strategy (that is, part (b)’s strategy) is \$84.5 million. Is price discrimination a profitable strategy? Explain.

(d) (10) What is the relation between marginal revenue in the two separate markets at the optimal discriminating solution? Show your work.

(e) (5) It can be shown that marginal revenue in any market can be expressed in the following way: \square , where \square is the (negative of) the elasticity of demand. Using this fact, show that firms who price discriminate will always charge a lower price in the more elastic market.

(f) (10) Which strategy (of the two described in parts (a) and (b)) will result in a smaller deadweight loss in this imperfectly competitive book market? Show your work and include appropriate diagrams.

Part 2: Empirical Work

The author, Kathryn Graddy, has provided us with the data set which she used for the paper. We have been able to replicate exactly most, but not all of her results. Even when we were unable to obtain exactly the same results we got ones which were very similar (some of our regressions include one fewer store than hers).

The key variables you will work with are:

pmealave	The average price of a meal at each store from the two waves of the survey
lnpmealave	The natural log of pmealave
primsample	A dummy variable which equals 1 for stores that are in the “primary sample,” 0 otherwise
secondsample	a dummy variable which equals 1 for stores that are in a “secondary sample” used by Graddy for columns 4, 5, and 6 in Tables 2 through 5, 0 otherwise
bk	a dummy variable which equals 1 if the store is a Burger King store, 0 otherwise
rr	a dummy variable which equals 1 if the store is a Roy Rogers store, 0 otherwise
wen	a dummy variable which equals 1 if the store is a Wendys store, 0 otherwise
kfc	a dummy variable which equals 1 if the store is a Kentucky Fried Chicken store, 0 otherwise
wage_st	the starting wage in Wave 1
wage_st2	the starting wage in Wave 2
lnpsodaave	The natural log of the average price of a soda at each store from the two waves
lnpentreeave	The natural log of the average price of an entree at each store from the two waves

Open the data set, graddyexam.dta with Stata.

(10) Draw a histogram of the starting wage in New Jersey in Wave 1 (February and March 1992) and Wave 2 (November and December 1992): Execute the following commands:

histogram wage_st if stat==1 (this draws the Wave 1 histogram for New Jersey)
histogram wage_st2 if stat==1 (this draws the Wave 2 histogram for New Jersey)

Discuss what you see in both histograms. Can you give an explanation for the differences between the two histograms?

1. (10) Run the basic regression for price of a meal on income and the bk, rr, and kfc dummies. Type the following command into Stata:

reg pmealave income bk rr kfc

(a) Copy the results into the space below.

(b) Interpret the coefficient estimates for income and for the kfc dummy variable.

2. (5) Why does the author run the regression using the log of the price of the meal on the log of income instead? Explain carefully. (There may be more than one answer to this question.)

3. (10) Run the regression of column 6 of Table 2:

reg lnmealave lnincome bk rr kfc if secondsample==1

What are two possible (not necessarily plausible) economic interpretations to the positive relationship between the log of the price of the meal and the log of income controlling for the type of store? Which interpretation makes more sense to you and why? (Hint: one explanation might come from supply and another from demand. We'll accept more than answer to this question.)

4. (10) Run specifications 5 for entrees and for sodas. Use the following Stata commands:

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reg lnptreeave p_bla bk rr kfc if secondsample==1  
reg lnpsodaave p_bla bk rr kfc if secondsample==1
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The R-square in the entrée regression in specifications 5 and 6 is much higher than the R-squares for the same specification for soda. What is causing this difference? Explain carefully.

5. (5) Graddy does not worry about heteroscedasticity in this paper. What is heteroscedasticity and why, in general, might it be something to worry about?

6. A reporter hears about the paper and is intrigued by the possibility that there is discrimination by blacks in fast-food restaurants in New Jersey and eastern Pennsylvania. You tell her that there might be discrimination, but that it is possible that other things are going on. She asks you two questions.
- (a) (10) First, does the paper really show that blacks pay more for fast food than whites? After all, looking at column 5 in Table 2, the coefficient on proportion black is positive but not statistically significant. Explain to the reporter why Graddy's paper does indeed give evidence that blacks pay more than whites, in other words why the specification of column 5 is not preferred.
- (b) (10) The reporter is not convinced that discrimination against blacks is the correct explanation for the empirical results of Graddy's paper. She asks, What are other possible explanations for Graddy's empirical results? Give her a clear answer in two to four paragraphs which sophisticated laypeople might be able to follow.