

Econ 131
Spring 2022
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Midterm Exam

March 9

Exam Instructions:

- **Explanation should be written using pens (we recommend black or blue ink, as these often scan the best).** No pencils, except for graphs.
- **You must submit your solutions using the exam packet provided.** If you need more room to write your answers or need to re-draw a graph use the extra pages at the end. Make sure to note it clearly and accurately if your solutions continue on a different page.
- **Do not write your solutions on pages that say “Do not write on this page”.** Answers written on these pages will not be graded.
- **When time is called, STOP** writing, immediately **CLOSE** your exam packet and hold it up until it is collected by one of the GSIs.
- **Show your work.** Credit will only be awarded on the basis of what is written on the exam.
- **Sign the academic honesty pledge.** Cheating will be punished.

Student Name:

Student ID Number:

Affirm the academic honesty pledge below. For those writing on a non-printed copy, please just write “Academic Honesty Pledge as on exam”, and sign your name.

If you do not affirm this pledge, your exam will be marked invalid.

0. ACADEMIC HONESTY PLEDGE

I confirm that I have abided by all academic honesty rules for UC Berkeley and Economics 131. I confirm that I did not see this exam before my official exam start time. I confirm that I have not shared and will not share this exam with anyone else. I confirm that I haven't copied from anybody else's exam.

Signature: _____

1. True/False/Uncertain (Questions 1a-e) (15 points, 3 points per question.)

Explain your answer fully based on what was discussed in class, since all the credit is based on the explanation. Your grade depends entirely on the substance of your justification, not on whether you are correct in writing “True” or “False”. Note that it is possible to answer each question for full credit with three sentences or fewer, and answers longer than ten lines long will not be graded.

(a) Labor supply theory and changes in incentives do a pretty good job at explaining the labor force participation of single mothers in the US over the last four decades.

(b) Taxes cannot have a very large impact on labor supply of prime age workers because France has much higher taxes than the US and yet about the same work rate among prime age workers..

(c) The theory of optimal commodity taxation argues that tax rates should be set equal across all commodities, in order to maximize efficiency through “tax smoothing”.

(d) Evidence from changes in the Value Added Tax in Europe shows that the price of goods or services rises by the full amount of the value added tax. Therefore, consumers are bearing the full burden of the value added tax.

(e) Even though top marginal tax rates for the individual income tax were very high in the 1950s in the US, the tax system overall wasn't very progressive because very few taxpayers were paying these very high marginal tax rates.

2. Incidence of Commodity Taxation (5 Points)

Consider the following model for the crunchy corn puff snack Cheetos market at the Golden Bear Café. Suppose the demand for Cheetos at the Golden Bear Café is given by $Q^D = 300 - 40P$, where P denotes the price and Q denotes the quantity of Cheetos demanded. The supply for Cheetos is given by $Q^S = 20P$.

(a) Compute the Cheetos market equilibrium. What are the equilibrium price and quantity?
(1 Point)

(b) Now suppose a tax of $t = \$3$ is imposed on each Cheetos that is purchased. Compute the Cheetos market equilibrium with the tax. What are the equilibrium price and quantity?
(1 Point)

(c) **Compute** and **graphically** depict deadweight loss due to the tax. (2 Points)

(d) What is the incidence of the tax? **In 5 sentences or less**, explain the intuition for the key factors that determine the incidence. *(1 Point)*

3. Labor Income Tax (10 Points)

Alexey is a graduate of UC Berkeley who took a job at a local consulting firm with a wage of \$20 per hour. The job is extremely flexible: Alexey is allowed to work any number of hours from 0 to 4000 per year. His preferences over aggregate consumption, c , and labor, ℓ , are represented by the following quasi-linear utility function:

$$\mathcal{U}(c, \ell) = 100c - \frac{\ell^2}{2}$$

- (a) Suppose that as soon as Alexey had taken the job, the government switched to the following progressive income tax system:
- Income up to \$10,000: no tax
 - Income between \$10,000 and \$40,000: 20% tax rate
 - Income above \$40,000: 30% tax rate

Draw a graph in consumption (c) / pre-tax income ($z = w\ell$) space showing Alexey's opportunity set with and without the new tax system. How many hours Alexey would need to work to reach pre-tax income \$10,000? How many hours to reach pre-tax income \$40,000? (3 Points)

- (b) For each level of pre-tax income, determine the sign of the income effect, substitution effect, and total effect of the reform compared to a baseline with no taxes, and fill in the following table. Use \uparrow to indicate if the an effect incentivizes work, \downarrow if it disincentives work, 0 is there is no effect, and ? if the effect is uncertain.

(2 Points)

Pre-Tax Income	Income effect	Substitution effect	Total Effect
Below \$10,000			
Between \$10,000 & \$40,000			
Above \$40,000			

- (c) Solve for Alexey's optimal choice of labor under no tax and under the new tax system. Please explain your reasoning and discuss whether your result here is in line with your answer in (b). *Hint: you can use any method of optimization discussed in class.*

(3 Points)

(d) Suppose now that the 30% marginal tax rate starts at \$30,000 instead of \$40,000. How many hours will Alexey choose to work now? (*2 Points*)

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