

Econ 1: Spring 2012: Sample Final Exam

Note: This sample exam is *much* longer than the real exam could possibly be...

I. Identifications:

Write one sentence on the importance of each of the following phrases in the context of the course:

1. Friedman's "three equalities"
2. Cobb-Douglas utility functions
3. Price ceilings as a way of regulating monopolies
4. Price floors
5. Long-run marginal cost
6. Aggregate demand
7. Government purchases
8. The price level
9. Inflation
10. Investment expenditures by businesses
11. The marginal propensity to consume
12. Say' Law
13. Partha Dasgupta

14. Monopoly
15. Monopolistic competition
16. Thomas Robert Malthus
17. Collateralized Debt Obligations constructed from Mortgage-Backed Securities
18. Excess demand for financial assets
19. Central planning
20. Karl Marx
21. Producer surplus
22. Labor productivity
23. Indifference curves
24. Real interest rates
25. Nominal GDP
26. Real GDP
27. Employment-to-population ratio
28. Labor-force participation rate
29. Top 1%
30. Education premium

II. Making Macroeconomic Policy

Suppose that it is December 2012 and you are called to Washington to audition for a cabinet-level post in the next administration and to advise him on the proper size of the economic stimulus program.

Your forecast is that, were 2014 to be a normal business-cycle time, that the level of GDP in 2014 would be \$17.0 trillion/year. You are conducting your analysis in the income-expenditure framework where: $Y = C + I + G$, $C = c_o + c_y Y$. You believe that $c_y = 0.5$.

You project that there will be little change from trend in consumer confidence c_o , which you project at \$3 trillion/year in 2014. you project that business demand for investment spending will b \$4 trillion/year in 2014. And you project that the Federal Reserve will not take additional steps to stimulate the economy.

- a. What level of government purchases spending G do you recommend for 2014? Why?
- b. Suppose that the President-Elect’s political advisors say that it is very important, politically, to cut government spending. What do you say in response?
- c. Suppose that the collaose of the euro suddenly drives up interest rate spreads, and leads you to forecast that I in 2014 will be not \$4 trillion but \$3.5 trillion. How do you change your recommendation for G ?

III.Problems

A. Phillips Curve: Consider the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$ —the inflation rate π equals: (i) the previously-expected inflation rate $E(\pi)$, (ii) plus the “slope” coefficient β , (iii) times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u .

Calculate the rate of inflation π if:

- a. $E(\pi) = 2\%$ per year, $\beta = \frac{1}{2}$, $u^* = 6\%$, $u = 4\%$
- b. $E(\pi) = 9\%$ per year, $\beta = \frac{1}{2}$, $u^* = 5\%$, $u = 7\%$
- c. $E(\pi) = 2\%$ per year, $\beta = \frac{1}{2}$, $u^* = 4\%$, $u = 8\%$
- d. $E(\pi) = 4\%$ per year, $\beta = \frac{1}{2}$, $u^* = 5\%$, $u = 10\%$
- e. $E(\pi) = 6\%$ per year, $\beta = \frac{1}{2}$, $u^* = 5\%$, $u = 8\%$
- f. $E(\pi) = 0\%$ per year, $\beta = \frac{1}{2}$, $u^* = 6\%$, $u = 4\%$

B. Supply and Demand: In the central part of the state of Euphoria there is a small city, Avicenna, which is the home of Euphoric State University. [“Avicenna”

is a corruption of the Arabic Ibn Sina, the byname of the great eleventh-century Iranian Abu Ali al-Husayn ibn Abd Allah ibn Sina: academic administrator, Quran reciter, astronomer, chemist, geologist, psychologist, theologian, mathematician, physicist, physician, poet, and paleontologist.] Consider the daily market for espresso-based drinks in Avicenna with demand and supply curves given by the equations:

$$QD = 5000 - 1000P$$

$$QS = -10000 + 4000P$$

where P is the price of an espresso-based drink in dollars. Now suppose that PDC becomes alarmed at the number of strokes that are being treated at the public hospitals of Euphoria, and becomes aware of the link between caffeine consumption and blood pressure on the one hand and between blood pressure and strokes on the other. They decide to impose on consumers a \$1/drink tax on espresso drinks and devote the money to hospital stroke-care units.

- a. What is the equilibrium price that consumers pay?
- b. What is the equilibrium price that producers receive?
- c. What is the equilibrium quantity?
- d. How much money is raised for hospital stroke care units?
- e. What is the producer surplus?
- f. What is the consumer surplus?

C. Monopoly: In the far north of the state of Euphoria there is a small town called Ihavefoundit. There is one theater in Ihavefoundit, and there is no connectivity to the outside world whatsoever. This means that the 1000 or so residents of Ihavefoundit who have a fondness for watching classic Japanese cinema with subtitles have only one way to do so: somebody has to rent a copy of a movie and rent the theater—paying \$420 to do both of those things—and then show the movie, charging admission. No matter how many people show up to the theater the cost of showing the movie remains the same: \$420.

You are conducting market research to discover the shape of the demand curve. You determine that there is nobody who will pay a price of \$60, 1 who will pay \$59, 2 who will pay \$58, and so on down until you hit \$10, at which point there will be 50 willing to pay to see the movie. Then 60 people will be willing to pay \$9, 70 in total will be willing to pay \$8, 80 will be willing to pay \$7, 90 will be willing to pay \$6, 100 will be willing to pay \$5, 110 people will be willing to pay \$4, 120 will be willing to pay \$3, 130 will be willing to pay \$2, 140 will be willing to pay \$1, and 150 will come if it is free.

Suppose that the profit--making Monopolist Entrepreneurial Company is thinking of entering the business as the only—the monopoly—seller of opportunities to see classic Japanese cinema in the benighted, fog---bound, and redwood---infested town of Ihavefoundit. They hire you to analyze the situation given your extensive market research. They ask:

- a. What price maximizes profits for the Monopolist Entrepreneurial Company?
- b. What profits will the MEC make at that price?
- c. What is the consumer surplus for that price?
- d. What is the total social surplus for that price?

D. Monopoly: In the same setup as the previous problem, the Redwood Cinema Collective says that it is bad for the MEC to profit from the love of the citizens of Ihavefoundit for subtitled Japanese classic cinema and proposes that they run the movies as a break-even nonprofit.

- a. What price will they charge?
- b. How many people will come to the cinema?
- c. What is the consumer surplus?
- d. Which arrangement--unregulated monopoly or efficient nonprofit--do you prefer? Why?

E. Utility Theory: Suppose we have students going to Euphoric State University who spend their money on only two things all semester: yoga lessons Y and lattes L . Suppose that Channing T. has a Cobb-Douglas utility function of the form:

$$U = Y^{(\theta)}L^{(1-\theta)}$$

Suppose that the price of a yoga lesson is \$20 and the price of a latte is \$5, and that in a week Channing T. buys 4 times as many lattes as she takes yoga lessons. If his preferences are consistent, what is his personal θ ?

F. National Income Accounting: Explain whether or not, why, and how the following items are included in the calculation of GDP:

- a. Fees paid to Google to buy advertisements.
- b. Fees earned by real estate agents selling newly-built homes.
- c. Medicare payments to doctors by the government.
- d. Repair of an old dam by the Army Corps of Engineers.
- f. Rent paid on an already-built house.

G. Keynesian Cross: Consider the simple Keynesian closed-economy income-expenditure model; $Y=C+I+G$. The idea is that if production and national income Y is less than or greater than spending $C+I+G$, production and income will rise or fall until they are equal. Suppose $C = 5 + 0.666Y$

- a. $G=3$, $I=2$: what is Y ?
- b. I falls by 0.5: what happens to Y ?
- c. I recovers and rises by 0.3, but G falls by 0.3: what happens to Y ?

d. I falls by 0.25: what happens to Y?

f. I recovers and rises by 0.2, but G falls by 0.3: what happens to Y?

H. Phillips Curve: In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$ —the inflation rate π equals the previously- expected inflation rate $E(\pi)$ plus the “slope” β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u —and in which this year’s expected inflation $E(\pi)$ is last year’s actual inflation, calculate the rate of inflation π :

a. In the first year, if the starting $E(\pi)=2\%$ per year, $\beta = 1/2, u^*=5\%$, and $u=5\%$

b. In the second year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part a— $\beta = 1/2, u = 5\%$, but structural changes in the economy raise u^* to 7%

c. In the third year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part b— $\beta = 1/2, u = 5\%$, but structural changes in the economy keep u^* at 7%

d. In the fourth year, if $E(\pi)$ is what inflation was the previous year—that is, if $E(\pi)$ is your answer to part c— $\beta = 1/2, u = 5\%$, but structural changes in the economy keep u^* at 7%.

e. What should the government and central bank do if they want to keep inflation from rising?

I. Economic Growth: In 8300 BC there were roughly 5 million people in the world—with an average standard of living of about \$500/year. In 1700 there were roughly 640 million people in the world—with an average standard of living of about \$500/year. In 1900 there were roughly 1.6 billion people—with an average standard of living of about \$565/year. Today there are roughly 7.2 billion people—with an average material standard of living of \$8035 dollars per year.

- a. Use the *Rule of 72* to calculate the average population growth rate and the average global real GDP growth rate between 8300 BC and 1700 AD.
- b. Use the *Rule of 72* to calculate the average global real GDP growth rate between 1700 and 1900 AD.
- c. Use the *Rule of 72* to calculate the average global real GDP growth rate between 1900 and 2012.
- d. How much faster has global real GDP growth been over 1900-2012 than it was over 8300 BC-1700 AD?
- e. How much faster has global real GDP growth been over 1900-2012 than it was over 1700-1900?
- f. What would global real GDP be in 2100 if it were to grow as rapidly between now and 2100 as it grew from 1900-2012?
- g. If there are 10 billion people in the world in 2100 and if global real GDP be in 2100 if it were to grow as rapidly between now and 2100 as it grew from 1900-2012, what would average living standards be in 2100?
- h. Why do they call it the “Industrial Revolution”?

IV. Essays:

A. First Essay: Write an essay on one of the following two topics:

1. What do the Friedmans think are the biggest things wrong with the U.S.'s welfare and social insurance systems as they stood in 1980? Do you think they would find the same to be the system's most important flaws today? Why or why not?
2. What, in the end, does Partha Dasgupta think are the reasons that Desta's life-chances in Ethiopia are so much more restricted than Becky's life chances in suburban Chicago? What policy changes does he recommend to improve Desta's opportunities?

B. Second Essay: Write an essay on one of the following two topics:

1. Explain why the Friedmans think that the Food and Drug Administration is unnecessary. The Chinese government relatively recently executed the head of its counterpart Food and Drug Administration for failing to do his job: for being corrupt and allowing substances dangerous to health and life to enter the

domestic and export food value chains. Does this change your view of the Friedmans' argument about the FDA? Why or why not?

2. Milton Friedman's teacher Henry Simons said that the Federal Trade Commission's Antitrust Enforcement Division—the people who determine what monopolies are and then break them up—should be the most powerful and important agency of government. Milton Friedman disagreed. Briefly lay out the arguments for and against Simons's position that active antitrust enforcement to break up monopolies is the most important thing for a government to do.

C. Third Essay: Write an essay on one of the following two topics:

1. Karl Marx thought that the capitalist market system would eventually be overthrown because of a mass popular revolution against (a) its inability to deliver an appropriate and relatively egalitarian distribution of income, and (b) its inability to maintain a stable high level of aggregate demand and low unemployment. What have you learned in this course that sheds light on why Marx was wrong (or, if you think so, right)?
2. Karl Marx thought that after the revolution the production, organization, and distribution tasks of the economy would be determined not by a market system seeking equilibrium but rather by a common collective democratically agreed-on plan. What have you learned in this course that sheds light on why such an arrangement of economic activity might be undesirable (or, indeed, impossible)?