

PROBLEM SET #1 (12 points possible; max you can earn for all 3 PS = 30 points)

DUE: via gradescope, 11:59.00 p.m. on Friday February 5

- PS submitted between the due date/time & 11:59.00 pm on Monday February 8 incur 5 point penalty
- No submission after Monday February 8 at 11:59 pm
- Your submitted work must be your own.
- Problem sets that are identical (in whole or in part) to another student's problem set will receive a zero.
- Problem sets with no honor pledge (item #1) will receive a zero.
- For each question, you'll write or type your answers and then create a file (pdf, png, jpg, or bmp) to upload to gradescope.
- There may also be some information you'll need to enter directly into gradescope. This will be clear in the question.
- You can hand write or type (exception: #1 must be handwritten), but you must have each question addressed in a separate file.
- If you've never uploaded files to gradescope before, see the gradescope hints on course website.
 - Gradescope accepts many file types: PDFs, images.

Question 1 (If not completed, then you get a 0 on the PS)

Write your answer to this question. Photo or PDF it. Upload the file to PS1, question #1 in gradescope. You shouldn't need more than about 1/2 page for this answer.

In your own handwriting, write the words in the pledge below. Using a pen-enabled tablet or writing on a piece of paper is fine. But it must be hand-written and not typed.

Directly under the pledge, provide the names of the people in your study group. If you didn't study with anyone, write "none."

Sign at the bottom.

Pledge: Studying with others in the class is ok but turning in answers or essays that someone else wrote is not ok. On my honor, the answers & essays I provide in this PS were written by me with my words. I am not copying anyone else's answer, copying from any printed or internet source, nor providing materials for others to copy. The consequence of violating this pledge is a 0 on this assignment and referral to the Office of Student Conduct.

The members of my study group are: _____

Signed (your signature):

Question 2 (1 point)

Write or type your answer to this question on a separate sheet/in a separate file. Photo or PDF it. Upload the file to PS1, question #2 in gradescope. You shouldn't need more than about 1/2 page for this answer.

GDP = C + I + G + GX - IM. Explain why we subtract imports rather than just ignore them.

Question 3 (1 point)

Write or type your answer to this question on a separate sheet/in a separate file. Photo or PDF it. Upload the file to PS1, question #3 in gradescope. You shouldn't need more than about 1 page for this answer.

Starting from the standard Cobb-Douglas form of the production function, derive $\frac{Y}{L} = \left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}} E$

Question 4 (2 points)

Write or type your answer to this two-part question on a separate sheet/in a separate file. Clearly indicate which is part (a) and which is part (b). Photo or PDF it. Upload the file to PS1, question #4 in gradescope. We think you only need 1 page for this answer, but if it rolls to a second page that's ok. Just be sure it's all in one pdf.

- A. From the equation expressing the balanced growth equilibrium condition, $g(Y/L) = g(K/L)$, derive the implication: K/Y is constant in BGE.
- B. From the equation expressing the balanced growth equilibrium condition and using a Cobb-Douglas production function, derive the implication: in BGE, the growth rate of the standard of living, Y/L , equals the growth rate of efficiency, E .
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Question 5 (2 points)

For this question, there will be some numeric answers that you'll enter directly into gradescope. Your work for both parts should be written or typed on a separate sheet/in a separate file. Clearly indicate which is part (a) and which is part (b). Photo or PDF it. Upload the file to PS1, question #5 in gradescope. We think you only need 1 page for your work, but if it rolls to a second page that's ok. Just be sure it's all in one pdf.

Suppose the economy can be defined by the following

$$s = 36\% \\ n = \frac{1}{2}\%$$

$$g = 2\% \\ \delta = 1\frac{1}{2}\%$$

$$\alpha = 1/3 \\ E_0 \text{ (initial value of } E) = \$20,000/\text{yr}$$

- A. In BGE, what are the values of K/Y , Y/L , and K/L when $E = E_0$? You'll enter your answers in boxes in gradescope (no units or you'll mess up the auto-grading). You'll upload a copy of your work. Your work should clearly show the units.
- B. Provide expressions that show the BGE values of Y/L and K/L after 10 years. Use your expressions to compute the BGE values of Y/L and K/L after 10 years. You'll enter your answers in a box in gradescope (no units or you'll mess up the auto-grading). You'll upload a copy of your work. Your work should clearly show the units.
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Question 6 (3 points)

Write or type your answer to this question, clearly labeling each part. Photo or PDF it. Upload the file to PS1, question #6 in gradescope. For each part, you shouldn't need more than about 1/2 page for this answer.

(This was a question on the Spring 2017 midterm.) Consider two economies – Economy A and Economy B – that are initially in BGE. Both economies have the same production function. Initially both economies have the same levels of output per worker. Then war between Economy A and Economy B begins. The battles of the war take place only in Economy A, destroying about 25 percent of its capital stock. In both economies, about 1 percent of the labor force is killed in the war. Assume that there is no change to the saving rate as a result of the war. Assume efficiency (E) is constant in both economies.

- A. (1 point) After the war ends, is Economy A in BGE? Is Economy B in BGE? Defend your answers.
- B. (1/2 point) Draw a graph that shows the determination of the pre-war and post-war K/L and Y/L for Economy A and Economy B. Label everything clearly, using subscript "0" to denote the common pre-war position, subscript "A" to denote postwar economy A and subscript "B" to denote postwar economy B.
- C. (1 point) Suppose that natural population growth is endogenous: in both economies, natural population growth is inversely related to output per worker. Explain why the war will therefore cause the economies of these two countries to diverge.
- D. (1/2 point) Redraw the graph from part B. Illustrate your answers from part C by adding to the redrawn graph. Continue using subscripts "A" and "B" to distinguish the two economies. Use superscript "*" to denote the new BGE positions.
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Question 7: The Essay (3 points total)

Updated 1/29/2021 4 pm (updates in red)

Consider this argument: “I don’t care whether government spending is to build and maintain new and efficient transportation and communication networks, to hire more teachers, or to increase payments to unemployed people. Increased government spending lowers the standard of living in the long run.”

Follow steps 1, 2*, 3, and 4 of “The Olney Method” (the 5-step method Prof. Olney presented on 1/21 for critiquing arguments) and write a 1-page essay in which you critique the argument above. Your essay should reflect your understanding of how to critique an argument and your understanding of the long-run growth model.

**You need not identify all assumptions in the argument, but do need to at a minimum identify the assumption that you change in step 3.*

Remember that in economics (as in life), the conclusions you come to will depend in part on the assumptions you make. Don’t invoke wildly unrealistic assumptions; the assumptions you make should be reasonable.

Your essay must be your own work that was developed for this course. To present anyone else’s work as your own is theft of intellectual property: plagiarism. While it is unlikely that you will need to cite sources for your essay, if you do then you must use quote marks “ ” around any words you quote exactly from any source (and then provide the source for the quote). Also, if you get ideas from anyone else, or if you paraphrase someone else, you must again give them credit for their ideas. To do otherwise is plagiarism: the theft of intellectual property, a violation of the Code of Student Conduct and one of the worst offenses in academe. If you have questions about whether or not you’ve properly cited your sources, please talk with your GSI or Prof. Olney.

“Your own work” also means that essays crafted jointly on piazza or otherwise are not acceptable. That too is plagiarism.

And, self-plagiarism is plagiarism. You cannot submit a paper that you wrote for another class.

Specifications: 400 words maximum, one page maximum. (“Works Cited” list can be on a second page and does not count against the 400 word maximum.) Double space. 10-11-12 pt font. 1" margins on all sides. Your name, date, and the word count in the top right corner.

Submission: Essay must be submitted twice. [1] Upload the essay in the PS1, question #7 in gradescope.[2] Submit the essay electronically via bCourses, assignments tab. Acceptable formats on bCourses: doc, docx, pdf. bCourses will check your paper using TurnItIn to ensure you have not plagiarized from published sources or previously submitted papers written by you or others.

Grading: 0 - 1 - 2 - 3 points, taking into account content, following specifications, and writing quality. No submission on bCourses results in a 0 on the essay.