

UCLA - Econ 102 - Fall 2018

Instructor: François Geerolf

Final Exam

December 13, 2018

Time Limit: 3 hours

Last Name: _____

First Name: _____

Student ID Number: _____

Signature _____

Final Exam

This exam contains 21 pages (including this cover page). You can earn 100 points.

Instructions:

1. Print your Last name, First Name, Student ID Number and Signature at the top of this page.
2. The only items which should be on your desk are pencils and/or pens. NO other items are allowed. Place any other item UNDER your desk. Calculators are NOT allowed.
3. Once the exam begins, you are not allowed to leave the room until you hand in your exam.

Good luck ! Budget your time wisely ! (skip the question or even the exercise if you get stuck)

Do not write below this line (Grader use only)

Question	Points	Score
1	40	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
Total:	100	

40 Multiple Choice Questions (40 points)

1. (40 points) Each multiple choice question has only one right answer. Use the Scantron to mark your answers.
 - (1) (1 point) Which of the following would tend to make the government expenditure multiplier smaller?
 - A. an increase in the marginal propensity to consume
 - B. an increase in the marginal propensity to save
 - C. a reduction in taxes
 - D. a reduction in government spending
 - E. none of the above
 - (2) (1 point) Which of the following would tend to make the tax multiplier smaller?
 - A. an increase in the marginal propensity to consume
 - B. an increase in the marginal propensity to save
 - C. a reduction in taxes
 - D. a reduction in government spending
 - E. none of the above
 - (3) (1 point) Based on our understanding of the paradox of thrift, we know that a reduction in the desire to save will cause:
 - A. an increase in equilibrium GDP.
 - B. a reduction in GDP.
 - C. an increase in government spending.
 - D. no change in equilibrium GDP.
 - E. a permanent reduction in the level of saving.
 - (4) (1 point) If $C(Y_D) = 2000 + .9Y_D$, investment is exogenous, and the economy is closed, what decrease in taxes must occur for equilibrium output to increase by 1000?
 - A. 900.
 - B. 111.111...
 - C. 100.
 - D. 1000.
 - E. 500.
 - (5) (1 point) Which of the following is less efficient at increasing equilibrium output?
 - A. increases in consumer confidence
 - B. increases in investment
 - C. increases in government spending
 - D. decreases in taxes

- (6) (1 point) Based on the Keynesian Cross model, an equal and simultaneous reduction in G and T will cause:
- A. an increase in output.
 - B. no change in output.
 - C. a reduction in output.
 - D. an increase in investment.
- (7) (1 point) Suppose that the marginal propensity to consume is 0.8. Given this information, which of the following events will cause the largest increase in output?
- A. G increases by 200.
 - B. T decreases by 200.
 - C. I increases by 150.
 - D. both A and B.
- (8) (1 point) In the overlapping generations model, why do people save?
- A. To leave bequests.
 - B. For prestige.
 - C. Because of religious beliefs.
 - D. They have too much money.
 - E. To plan for retirement.
- (9) (1 point) Which of the following cannot increase long-run growth?
- A. Patents.
 - B. Capital accumulation.
 - C. Government funded research.
 - D. Prizes.
 - E. Privately funded research.
- (10) (1 point) Assume that the uncovered interest parity condition holds. Also assume that the U.S. nominal interest rate is less than the U.K. nominal interest rate. Given this information, we know that investors expect:
- A. the pound to depreciate.
 - B. the pound to appreciate.
 - C. the dollar-pound exchange rate to remain fixed.
 - D. the U.S. interest rate to fall.
 - E. none of the above.

- (11) (1 point) The **four** following multiple choice questions are based on the Bathtub model. In the Bathtub model, what is the law of motion for unemployment?
- A. $\Delta U_{t+1} = fU_t - sE_t$
 - B. $\Delta U_{t+1} = sE_t - fU_t$
 - C. $U_{t+1} = sE_t - fU_t$
 - D. $\Delta U_{t+1} = fL - sE_t$
 - E. $U_{t+1} = fU_t - sE_t$
- (12) (1 point) Assume a monthly job separation rate equal to $s = 1\%$, and a monthly job finding rate equal to $f = 19\%$. Assume that the labor force is given by $L = 100$ million. What is the steady-state unemployment rate?
- A. 4.8%
 - B. 4%
 - C. 5%
 - D. 5.8%
 - E. 5.2%
- (13) (1 point) Assume that initially, the unemployment rate is given by $u_0 = 10\%$. How many people lose their jobs each month initially?
- A. 900,000
 - B. 1,000,000
 - C. 10,000,000
 - D. 1,900,000
 - E. 190,000
- (14) (1 point) Assume that initially, the unemployment rate is given by $u_0 = 10\%$. How many people find a job each month initially?
- A. 900,000
 - B. 1,000,000
 - C. 10,000,000
 - D. 1,900,000
 - E. 190,000
- (15) (1 point) Assume a country is closed. Given this information, which of the following must occur?
- A. demand for domestic goods will be less than the domestic demand for goods.
 - B. demand for domestic goods will be greater than the domestic demand for goods.
 - C. $S + T = I + G$.
 - D. a budget surplus exists.
 - E. $S = I$.

- (16) (1 point) In an open economy, which of the following will cause an increase in the size of the multiplier?
- A. a reduction in the marginal propensity to import
 - B. a reduction in foreign output
 - C. an increase in the marginal propensity to save
 - D. all of the above
 - E. none of the above
- (17) (1 point) Suppose there is a reduction in foreign output (Y^*). This reduction in Y^* will cause which of the following in the domestic country?
- A. a reduction in output.
 - B. a reduction in consumption.
 - C. a reduction in net exports.
 - D. all of the above.
 - E. none of the above.
- (18) (1 point) An increase in government spending will have a greater impact on net exports when:
- A. the marginal propensity to save is smaller.
 - B. the economy is closed.
 - C. the sensitivity of investment to income is smaller.
 - D. all of the above.
 - E. none of the above.
- (19) (1 point) Which of the following will occur in a small country with a high marginal propensity to import?
- A. Changes in government spending will cause large changes in output.
 - B. Changes in government spending will cause large changes in the trade balance.
 - C. A depreciation will cause only small changes in the trade balance.
 - D. There is no combination of policies that can eliminate the trade deficit.
 - E. all of the above.
- (20) (1 point) Which of the following would make the government spending multiplier smaller?
- A. a reduction in marginal propensity to save.
 - B. a small initial trade deficit.
 - C. a reduction in the marginal propensity to import.
 - D. a real appreciation.
 - E. none of the above.

- (21) (1 point) Which of the following will occur as a result of a tax increase?
- A. private saving increases.
 - B. investment increases.
 - C. the trade balance improves.
 - D. the trade balance worsens.
 - E. the budget deficit increases.
- (22) (1 point) An open economy with a low total level of saving (private and public) must have:
- A. low investment only.
 - B. high investment only.
 - C. a trade surplus only.
 - D. low investment or a trade deficit.
 - E. low investment or a trade surplus.
- (23) (1 point) Which of the following is not a result of a reduction in short-term interest rates?
- A. More competitive exports.
 - B. More refinancing of fixed-rate mortgages.
 - C. Increase in creditors' disposable income.
 - D. All of A, B, C.
 - E. None of A, B, C.
- (24) (1 point) According to the neoclassical synthesis:
- A. There is a positive correlation between unemployment and inflation.
 - B. There is an excess of saving over investment.
 - C. Prices are sticky.
 - D. Aggregate demand has long-run effects.
 - E. Output is always determined by technology.
- (25) (1 point) Who in history implemented the first Keynesian stimulus?
- A. Franklin D. Roosevelt
 - B. Herbert Hoover
 - C. John Maynard Keynes
 - D. Donald Trump
 - E. Adolf Hitler

- (26) (1 point) Which of the following methods cannot be used for empirical macroeconomics?
- A. Narrative Approaches.
 - B. Cross-sectional studies.
 - C. Individual-level studies on the Marginal Propensity to Consume.
 - D. Randomized experiments.
 - E. Individual-level studies on the Labor Supply Elasticity.
- (27) (1 point) If Jay Powell, the Chairman of the Federal Reserve Bank, decides to raise short-term interest rates unexpectedly, what will happen to the euro?
- A. It would appreciate relative to the dollar.
 - B. It would appreciate relative to the Yen.
 - C. It would depreciate relative to the dollar.
 - D. It would depreciate relative to the Yen.
 - E. None of the above.
- (28) (1 point) If Jay Powell, the Chairman of the Federal Reserve Bank, decides to raise short-term interest rates unexpectedly, what else will happen, at least in the short run?
- A. Manufacturing employment will increase.
 - B. Government spending will decline.
 - C. Consumption will rise.
 - D. Exports will decline.
 - E. None of the above.
- (29) (1 point) Despite the first budget surplus in over 20 years, the U.S. still experienced a large trade deficit at the end of Bill Clinton's presidency from 1998 to 2001. Which of the following is incorrect about this period?
- A. Investment boomed.
 - B. Fiscal policy was redistributive.
 - C. Consumption increased.
 - D. Imports Rose.
 - E. None of the above.
- (30) (1 point) Which of the following does Paul Krugman not believe?
- A. Output is mostly determined by the demand side.
 - B. We should maintain Pay-As-You-Go (PAYG) systems.
 - C. Public debt is worrying when it comes from tax cuts to the wealthy.
 - D. We need to "starve the beast".
 - E. We should send out checks to lower income people to boost consumption.

- (31) (1 point) Which of the following does Robert Barro not believe?
- A. Taxes need to be cut where marginal rates are initially the highest.
 - B. Output is mostly determined by the supply-side.
 - C. Social security needs to be replaced by private accounts.
 - D. Public deficits associated to marginal tax rate cuts are an important issue.
 - E. Tax cuts increase people's incentives to work.

The following four questions assume that $C = c_0 + c_1(Y - T)$, $T = t_0 + t_1Y$, $I = b_0 + b_1Y$, $M = m_1Y$, and $X = x_1Y^*$, $G = g_0 + g_1Y$, with $c_1 = 2/3$, $t_1 = 1/4$, $b_1 = 1/6$, $g_1 = 1/6$, $m_1 = 1/6$, and $x_1 = 1/4$. You need to first compute Y using that Z is the sum of all components of aggregate demand, and $Y = Z$.

- (32) (1 point) What is the government spending multiplier $\Delta Y/\Delta g_0$?
- A. 1/2
 - B. 3/4
 - C. 1
 - D. 2
 - E. 3
- (33) (1 point) What is the tax multiplier $\Delta Y/(-\Delta t_0)$?
- A. 1/2
 - B. 3/4
 - C. 1
 - D. 2
 - E. 3
- (34) (1 point) What is $\Delta Y/\Delta Y^*$?
- A. 1/2
 - B. 3/4
 - C. 1
 - D. 2
 - E. 3
- (35) (1 point) What is $\Delta Y/\Delta c_0$?
- A. 1/2
 - B. 3/4
 - C. 1
 - D. 2
 - E. 3

The following five questions assume 2 groups, the bottom 90% low-income group paying \underline{T}_0 with MPC \underline{c}_0 , and the top 10% high-income group richer by $\gamma = 9$, paying \bar{T}_0 with MPC \bar{c}_0 . Aggregate consumption is $C = C_0 - (\underline{c}_1\underline{T}_0 + \bar{c}_1\bar{T}_0) + c_1(1 - t_1)Y$, $T = \underline{T}_0 + \bar{T}_0 + t_1Y$, $I = b_0 + b_1Y$, $M = m_1Y$, and $X = x_1Y^*$, $G = g_0 + g_1Y$, with $\underline{c}_1 = 1/2$, $\bar{c}_1 = 1$, $t_1 = 1/3$, $b_1 = 1/6$, $g_1 = 1/6$, $m_1 = 1/3$, and $x_1 = 1/3$.

- (36) (1 point) What is the average propensity to consume c_1 in this economy?
- 1/3
 - 1/2
 - 2/3
 - 3/4
 - 1
- (37) (1 point) **You need to first compute Y using that Z is the sum of all components of aggregate demand, and $Y = Z$.** What is the government spending multiplier $\Delta Y/\Delta g_0$?
- 1/2
 - 1
 - 3/2
 - 2
 - 3
- (38) (1 point) What is the "tax cuts for the rich" multiplier $\Delta Y/\Delta(-\bar{T}_0)$?
- 1/2
 - 1
 - 3/2
 - 2
 - 3
- (39) (1 point) What is the "tax cuts for the poor" multiplier $\Delta Y/\Delta(-\underline{T}_0)$?
- 1/2
 - 1
 - 3/2
 - 2
 - 3
- (40) (1 point) What is the "redistribution multiplier" $\Delta Y/\Delta\underline{T}_0$ if $\Delta\bar{T}_0 = -\Delta\underline{T}_0$?
- 1/2
 - 1
 - 3/2
 - 2
 - 3

Exercise 1 (10 points)

2. (10 points) Consider the standard Solow growth model. We assume that the economy's production function is $Y = F(K, L) = K^{1/4}L^{3/4}$. Assume no population growth.
- (a) (1 point) What is the name of this production function?

- (b) (1 point) Show that this production function has constant returns to scale.

- (c) (2 points) For a given saving rate, s , and depreciation rate, δ , derive an expression for capital per worker in the steady state. Give the intermediate steps.

- (d) (2 points) Derive an expression for output per worker in the steady state. What is it equal to if $s = 24\%$ and $\delta = 3\%$?

An empty rectangular box with a thin black border, intended for the student to write their answer to question (d).

- (e) (2 points) Give an expression for consumption per worker in the steady state. What is it equal to if $s = 24\%$ and $\delta = 3\%$?

An empty rectangular box with a thin black border, intended for the student to write their answer to question (e).

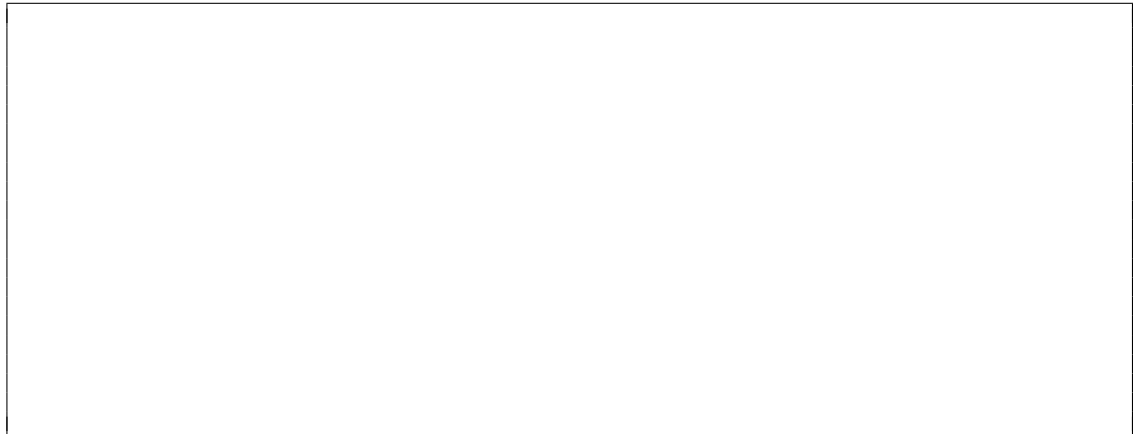
- (f) (2 points) Derive the consumption-maximizing saving rate. Show the intermediate steps.

An empty rectangular box with a thin black border, intended for the student to write their answer to question (f).

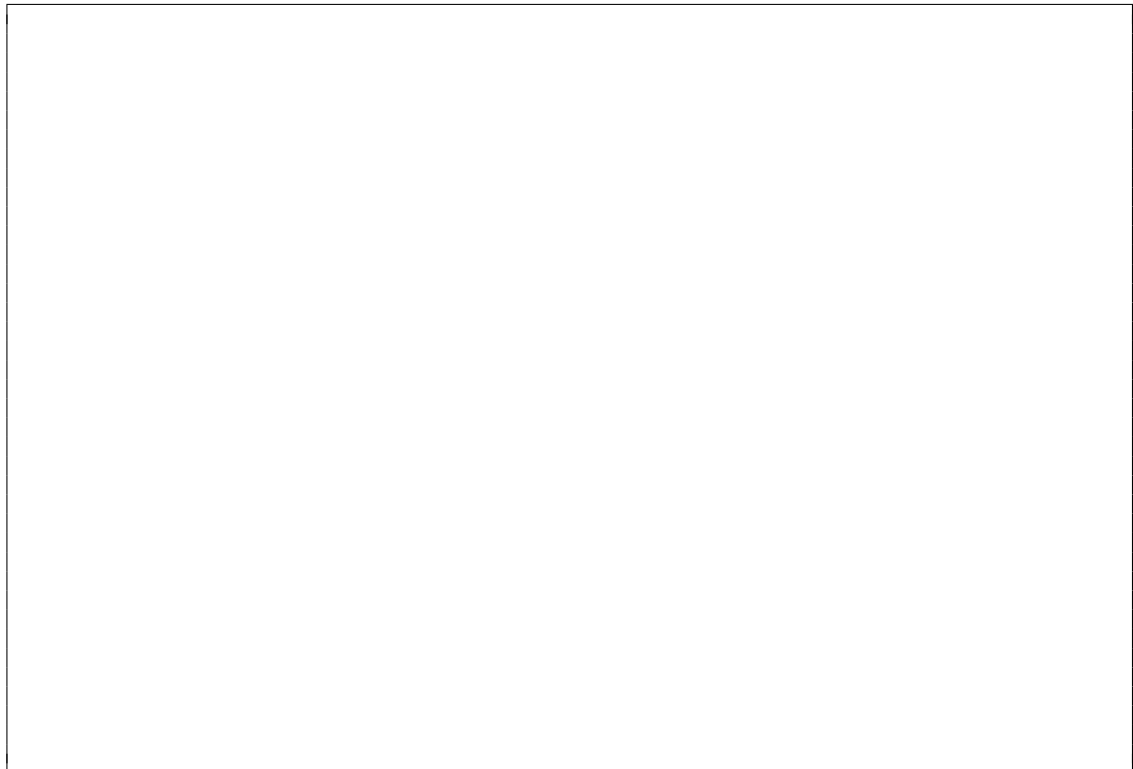
Exercise 2 (10 points)

3. (10 points) Consider the closed economy goods market model where consumption is linear in disposable income with $C(Y_D) = c_0 + c_1 Y_D$, disposable income is income minus taxes, government spending and taxes are exogenous and equal to G and T respectively, but investment depends on output through $I = b_0 + b_1 Y$.

(a) (2 points) Solve for equilibrium output.



- (b) (2 points) Assume that there is a fall in autonomous spending given by $\Delta c_0 < 0$. Show that there is a direct effect on private saving of the change in autonomous spending as well as an indirect effect. What is the sign of the direct effect? (Hint: the direct effect is $\Delta(-c_0)$)



- (c) (2 points) What is the value of the indirect effect, as a function of $\Delta c_0 < 0$?

- (d) (2 points) Compute the total effect of the change $\Delta c_0 < 0$ on private saving S (direct + indirect effect).

- (e) (2 points) Why is the total effect on private saving a paradox?

Exercise 3 (10 points)

4. (10 points) Consider the Solow growth model of Lecture 2, with however two small changes. Assume that the production function is given by $F(K_t, L_t) = A_t K_t^\alpha L_t^{1-\alpha}$, with A_t such that $A_t = (1 + g)^t$, and L_t such that: $L_t = (1 + n)^t$.

(a) (1 point) Write the law of motion for capital K_t .

- (b) (3 points) Define k_t as: $k_t \equiv \frac{K_t}{A_t^{1/(1-\alpha)} L_t}$, and write a law of motion for k_t . Assume that n , and g are small in order to simplify this law of motion. Hint: if n and g are small then: $(1 + g)^{1/(1-\alpha)}(1 + n) \approx 1 + \frac{1}{1-\alpha}g + n$.

- (c) (2 points) Compute k^* , the steady-state of k_t . Compute y^* and c^* corresponding to steady-state k^* with: $y_t \equiv \frac{Y_t}{A_t^{1/(1-\alpha)} L_t}$ and $c_t \equiv \frac{C_t}{A_t^{1/(1-\alpha)} L_t}$.

- (d) (2 points) What is the consumption-maximizing saving rate, which maximizes c^* ?

- (e) (2 points) What is then the value of the net interest rate r^* ? Reminder: the net interest rate is the gross interest rate (the marginal product of capital) minus the depreciation rate.

Exercise 4 (10 points)

5. (10 points) We consider again the schematic redistributive policies from the rich to the poor in the open economy, which we studied in lecture 11. We assume that aggregate consumption is $C = C_0 - (\underline{c}_1 \underline{T}_0 + \bar{c}_1 \bar{T}_0) + c_1(1-t_1)Y$, $T = (\underline{T}_0 + \bar{T}_0) + t_1Y$, $I = b_0 + b_1Y$, G fixed, $M = m_1Y$, $X = x_1Y^*$. We consider a reduction in taxes on the poor $\Delta \underline{T}_0 < 0$, with an offsetting increase in taxes on high income earners such that $\Delta T_0 = \Delta \underline{T}_0 + \Delta \bar{T}_0 = 0$. We then have that $\Delta \bar{T}_0 = -\Delta \underline{T}_0 > 0$.

- (a) (2 points) What is the effect of redistribution on ΔY ? What is the effect on the budget deficit of such a redistribution?

- (b) (1 point) Using that $\Delta NX = -m_1 \Delta Y$, compute the change in the trade deficit.

- (c) (2 points) We shall now decompose the trade deficit into saving and investment, to better understand the intuition behind the counterintuitive result. Compute first ΔI . Does it contribute to explaining the puzzle?

(d) (2 points) Compute now private saving ΔS .

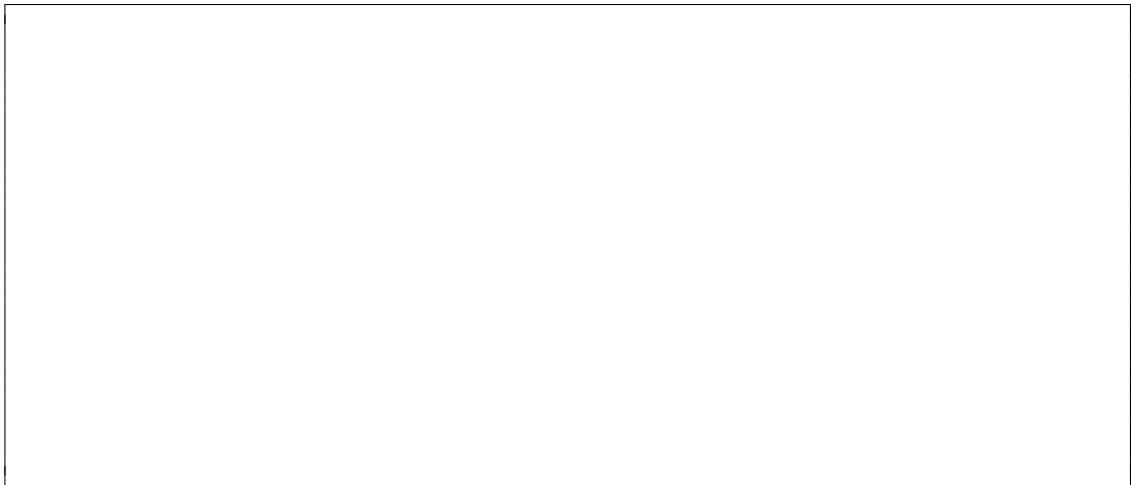
(e) (2 points) Compute the net effect, total saving minus investment.

(f) (1 point) Assuming that $m_1 = 1/6$, $b_1 = 1/6$, $t_1 = 1/4$, $\underline{c}_1 = 1$, $\bar{c}_1 = 1/3$, $c_1 = 2/3$, what is the size of each component?

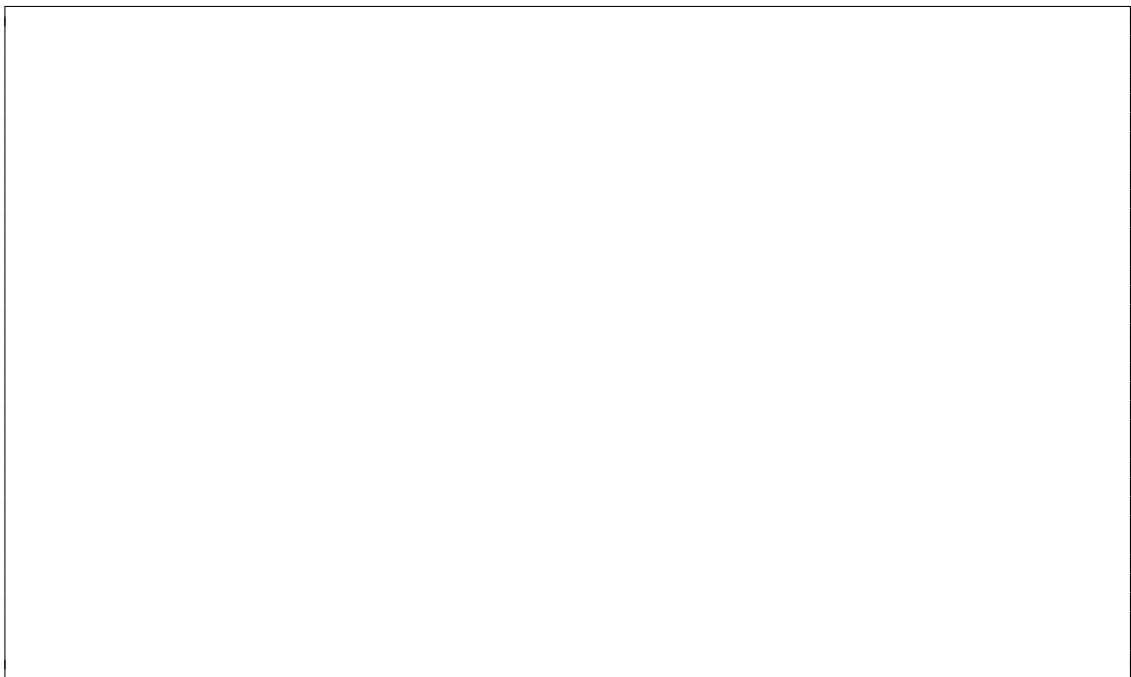
Exercise 5 (10 points)

6. (10 points) In this exercise, we consider the same problem as in lecture 10, except that lifetime utility is logarithmic with $\beta = 3$ (that is, people are patient instead of impatient, so they tend to save a lot): $U = \log(c_t^y) + 3 \log(c_{t+1}^o)$. We denote the (net) real interest rate by r_t so that the intertemporal budget constraint is: $c_t^y + \frac{c_{t+1}^o}{1+r_t} = w_t$. Other than that, we still assume that: $Y_t = K_t^{1/3} L_t^{2/3}$. We assume that the labor force is constant so that $L_t = 1$. The depreciation rate is $\delta = 1 = 100\%$.


- (a) (2 points) Using your preferred method, compute c_{t+1}^o and c_t^y as a function of w_t .



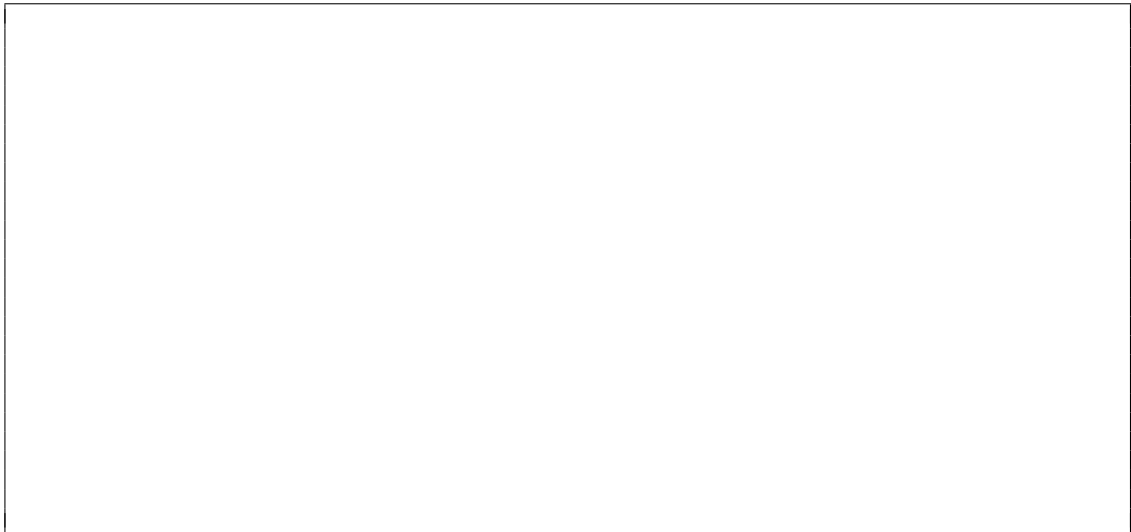
- (b) (2 points) What is the law of motion for the capital stock? Compute the steady-state capital stock K^* , the (net) steady-state real interest rate r^* .



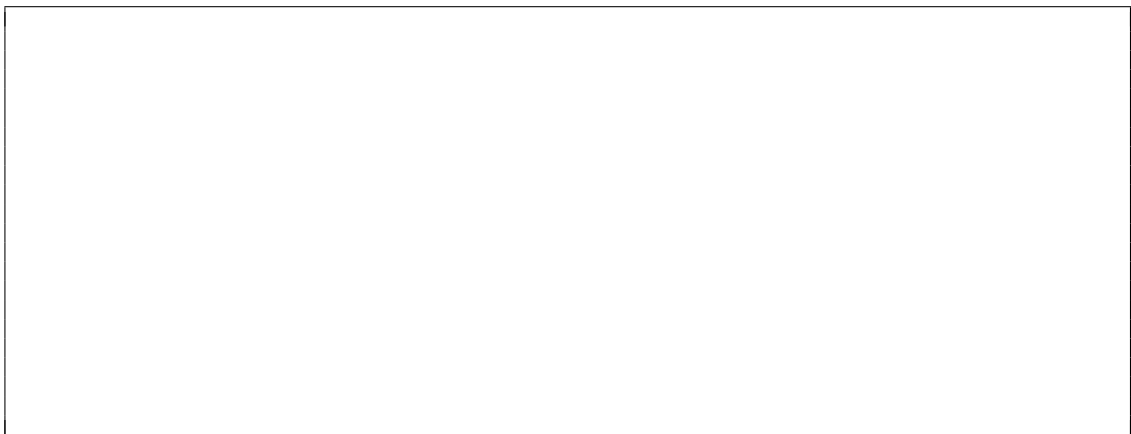
- (c) (2 points) Compute the Golden Rule net interest rate r_g^* , capital K_g^* and wage w_g^* .



- (d) (2 points) Compare the Golden Rule and steady-state levels of r^* and K^* , and give an economic intuition.



- (e) (2 points) What level of government debt B_g^* brings the capital stock to the Golden Rule level ?



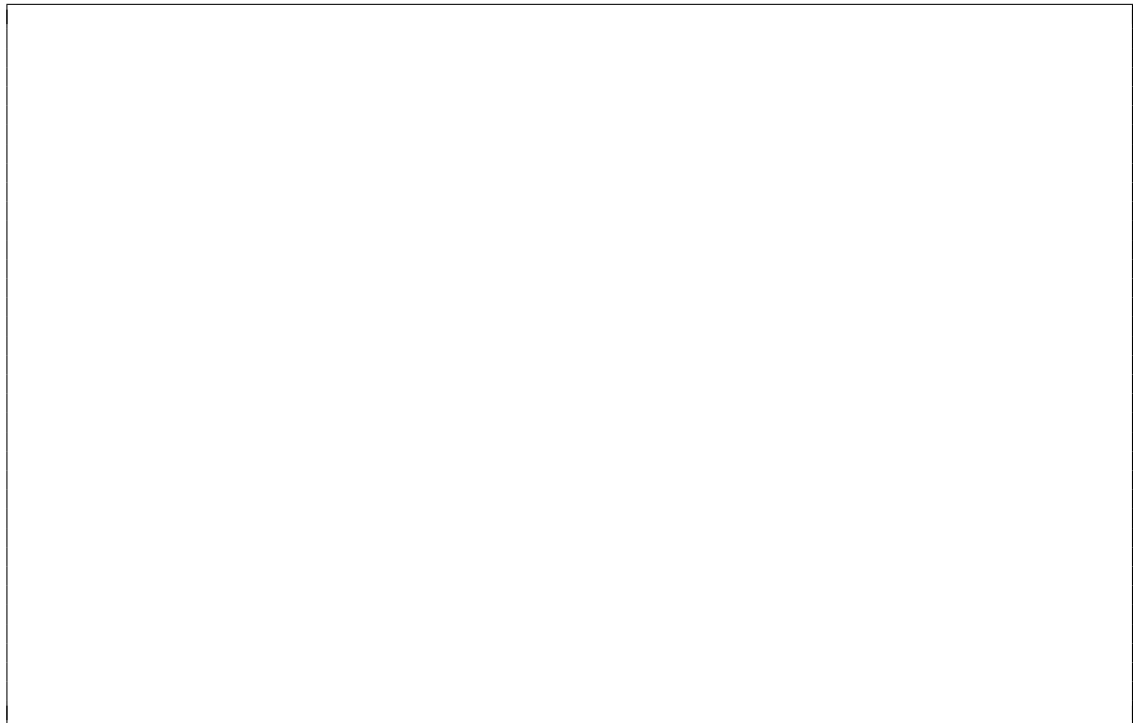
Exercise 6 (10 points)

7. (10 points) Consider an open economy where consumption is given by $C(Y_D) = 10 + 0.8Y_D$, investment is given by $I = 8 + 0.1Y$, government spending is given by $G = g_0 + 0.1Y$, taxes are given by $T = 10 + 0.5Y$, and imports and exports are given by $M = 0.1Y$ and $X = 0.1Y^*$ respectively, where Y^* denotes foreign output.

- (a) (2 points) Solve for equilibrium output in the domestic economy, given Y^* . What is the multiplier in this economy?

- (b) (2 points) If we were to close the economy - so exports and imports were identical and equal to zero - what would be the multiplier be? Why would the multiplier be different in a closed economy?

- (c) (2 points) **From now on, you may keep fractions for numbers, since you do not have a calculator.** Assume that the foreign economy is characterized by the same equations as the domestic economy (with asterisks reversed). Use the two sets of equations to solve for the equilibrium output of each country.



- (d) (2 points) What is the multiplier in each country now? Why is it different from the open economy multiplier in part (a)?



- (e) (1 point) What is the multiplier for a coordinated increase in government spending, such that $\Delta g_0 = \Delta g_0^*$?



- (f) (1 point) Is the multiplier then higher or lower than in the previous question? What is the economic intuition?

