

EC 103–002

Problem Set 3

Prof. Santetti

Fall 2022

INSTRUCTIONS:

For the *Concepts Review* section, your answers must be **handwritten**, scanned (you may use a phone app such as CamScanner), and submitted in a single PDF file with your *first name* (mine would be `marcio.pdf`). You can convert images to PDF format [here](#). Also, you can merge different PDF files [here](#).

For the *Hands-on* section, you will not submit an R script this time. You are asked to replicate a plot and a table. Follow the submission instructions given in each problem.

Submit your files via [theSpring](#). In case you experience any issues, email them to msantetti@skidmore.edu.

Assignment due 11/21, before class.

Points Possible: 70

- You have 2 weeks to complete this assignment. In accordance with our [course syllabus](#), no late submissions will be accepted.
- Be honest. Don't cheat.
- As a Skidmore student, always recall your votes of academic integrity, and the **Honor Code** you have abided by:

"I hereby accept membership in the Skidmore College community and, with full realization of the responsibilities inherent in membership, do agree to adhere to honesty and integrity in all relationships, to be considerate of the rights of others, and to abide by the college regulations."

Have fun!

Reflection

This portion was performed in class as a group assignment. Since all students participated, everyone may skip this section. (20 points)

Concepts Review

[True/False]: For the following 10 parts, evaluate whether the sentences are true or false. If false, give a brief explanation of why the sentence is incorrect.

- (a) We say that a country's currency *appreciates* when one unit of that currency can buy *less* units of a foreign currency than before. (1 point)
- (b) An *appreciation* of one currency relative to a second one necessarily implies a *depreciation* of this other currency. (1 point)
- (c) For instance, if the Euro *appreciates* relative to the US dollar, Euro-area *exporters* will benefit from selling goods and services to the US. (1 point)
- (d) Foreign tourists will always have a relatively higher purchasing power when traveling abroad, no matter how appreciated or depreciated their own currency might be. (1 point)
- (e) Foreign *investors* considering injecting money in an economy with a relatively stronger currency than their own will benefit from this situation. (1 point)
- (f) *Arbitraging* implies buying something where/when it is expensive, and selling when it becomes more affordable to other individuals. (1 point)
- (g) According to **official data**, at this time consumption expenditures account for almost 80% of US total Gross Domestic Product. (1 point)
- (h) An economy's *marginal propensity to consume* (MPC) is the fraction of a change in aggregate income spent on investment expenditures. (1 point)
- (i) From an aggregate perspective, the amount of aggregate income (Y) that is not consumed (C) becomes aggregate saving (S). (1 point)
- (j) If an economy *does not* experience an unexpected change in its inventories from one period to another, we may assume that *planned* investment equals *actual* investment. (1 point)

[Aggregate expenditures & multiplier effect]: Suppose you are given the following information regarding country YYZ:

- Aggregate consumption: $C = 350 + 0.6Y$
- Planned investment: $I = \$ 150$
- Aggregate expenditures definition: $AE = C + I$
- In equilibrium, aggregate income (Y) must be equal to aggregate expenditures (AE).

Answer the following questions. (If you **do not** show your calculations, you will be given **no credit**.)

- (a) What is YYZ's marginal propensity to consume? (2 points)
- (b) What is YYZ's marginal propensity to save? (2 points)
- (c) Show the expression for YYZ's aggregate expenditures function. (2 points)
- (d) What is the equilibrium level of income for YYZ? (2 points)
- (e) Now, suppose that the level of planned investment increases to $I' = \$ 200$ in the following year. What is the new equilibrium level of income for YYZ? (2 points)
- (f) Given your answers to parts (d) and (e), what is the size of YYZ's multiplier? To get full credit, you must show its value in two different ways. (2 points)

[The US FED & monetary policy] By reading the US FED's official statement on its latest monetary policy decisions, answer the following questions:

- (a) What is the FED's long-run target rate of inflation? (2 points)
- (b) What is the FED's latest decision on its interest rate instrument, the federal funds rate? (2 points)
- (c) In order to achieve this target interest rate, will the FED increase its buying or selling of US Government Treasuries? (2 points)
- (d) Based on your answer to part (c), does this measure increase or decrease the amount of money circulating in the economy for aggregate expenditures (i.e., consumption and investment)? Explain your answer; otherwise, you won't receive full credit. (2 points)

Hands-on

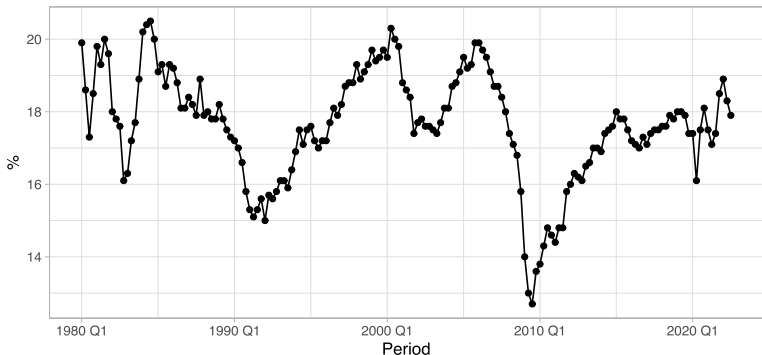
For this *Hands-on* section, you need not show any code for grading purposes. This time, you are asked to **replicate** what I present in parts (a) and (b). Part (a) asks you to replicate a plot, using the `ggplot2` package, and (b) asks you to replicate a table using the `gt` package.

For part (a), the video lectures for Labs 7 and 8 might be helpful. The same goes for part (b), where the video lecture for Lab 8 is the most recommended resource.

You will submit 2 PDF files, one for each part. Call part (a)'s file `a_plot.pdf` and (b)'s file `b_table.pdf`. If you do your replications exactly as they appear here, you will get full credit. Notice that, in the "source" space for the two parts, I ask you to put your names in there. This way, I will know that you were the author of each part.

(a) Download data for the share of aggregate investment expenditures in U.S. GDP (calculated by the BEA) from FRED using [this link](#). The data are in *quarterly* frequency. After importing it into RStudio, replicate the plot below. Do not forget to put your name in the "source" space, as highlighted there. *Hint 1:* Notice that my plot starts in the first quarter of 1980. *Hint 2:* I am using the `theme_light()` theme here. (10 points)

Share of Aggregate Investment in U.S. GDP
1980Q1-2022Q3



Source: U.S. Bureau of Economic Analysis. Author: **Your name here!**

(b) Using the same data as in part (a), you will now replicate the table below using the `gt` package. Notice that these are yearly averages. Do not forget to use the `group_by()` function before calculating the average value for each year. Here, I used the `gt_theme_538()` option from the `gtExtras` package to customize my table's theme. Do not forget to put your name in the source space, as highlighted there. (10 points)

Share of Aggregate Investment in U.S. GDP

Yearly averages, 2015-2022

YEAR	SHARE (%)
2015	17.8
2016	17.1
2017	17.4
2018	17.7
2019	17.8
2020	17.3
2021	17.6
2022	18.4

Source: U.S. Bureau of Economic Analysis. Author: ****Your name here!****