

## 45-711 – Assignment 5

DUE THURSDAY APRIL 23<sup>RD</sup>

Some guidelines:

1. This assignment is due by the end of day on the date printed above.
2. It is sufficient to submit one copy of the assignment per group.
3. You do not need to upload any spreadsheet or code you end up using.
4. Make sure to explain in detail every step you make to reach a conclusion.
5. Solving the assignment in Python is NOT required.

### Question 1: Country Report

*This question serves as a summary of everything we have done in class. In this question you will need to use all previous assignments as well as the organizational framework provided in the lectures.*

In this question, you are asked to write a macroeconomic report for a country. You can pick any country you wish but not the US nor China (since we talked about them so much in class). When writing the report it is crucial you use the class material as a guideline. Specifically, you can structure the report using the outline of the course: (i) first discuss GDP and its composition (into  $C$ ,  $I$ ,  $G$ ,  $NX$ ) as we have done in **Week 1**. Also provide a decomposition of GDP in trend and cycle as discussed in **Week 5**; (ii) discuss the growth experience of the country. Specifically analyze how productivity, labor and capital have contributed to economic growth. You can also discuss how the saving behavior and productivity behavior will shape future growth. These topics were covered in **Week 2**; (iii) comment about labor market conditions (unemployment and participation rate) as well as limits to the functioning of labor markets (minimum wage and regulations) as discussed in **Week 3**; (iv) talk about trade for the country; here also make sure to provide your view on the current account balance using the relationship between saving and investment. Also provide a statement on if the currency is over or under-valued relative to the dollar. These topics were covered in **Week 4 & 5**; (v) talk about the size and scope (what do they spend money on) of the government as well as the evolution of the debt as we discussed in **Week 6**.

At the beginning of the report, provide an executive summary with a couple of bullet points. In those points emphasize what are two aspects that you found interesting about this country when performing the analysis.

### Hints and Suggestions

- Data from the World Bank Development Indicators (WDI) and FRED is almost all the data you need. You used these datasets in previous assignments. You may also find it useful to access the Penn World Tables, which we have referenced in class and are available here (<https://www.rug.nl/ggdc/productivity/pwt/?lang=en>). Note, the Penn World Tables will give you access to real GDP, Employment (or Hours), and estimates of the (real) Capital Stock directly. (You should not use their estimates of TFP if you choose to report this information but compute it yourself and explain how.) Make sure to build on what you have done before.
- For information on exchange rates and information on Real Exchange Rates you can use this data: [data.oecd.org/conversion/exchange-rates.htm](http://data.oecd.org/conversion/exchange-rates.htm).
- Data availability varies greatly across countries. Before you get started, have a look if you have enough data easily available (if data is not available for a given step, just state that).
- Comparison with the US is a good way to provide context to a discussion. For example, when discussing how large is consumption ( $C$ ) versus GDP ( $Y$ ), what we discussed in Week 1 for the US serves as a useful benchmark: you can then discuss if the country is consuming more or less than a well-known benchmark. When using US data, it is ok to directly use materials from the slides.
- Use and refer to the key equations used in class. It is a great way to communicate what is being displayed in a graph or to frame a point being made in a paragraph. Think that the report has an economist (me) as a reader.
- Refrain from using explanations, mechanisms, or data that was not covered in class. For example, we did not discuss foreign debt crisis. While they can be important for a country, a formal analysis of them is well beyond the scope of this class. Also you need to describe what you see more than why certain observations are the way they are.
- Make sure to be very clear (in an appendix if you wish) about the data used or any assumption made in the quantitative analysis.
- When commenting on data make sure to differentiate between historical trends and recent developments (last five years).
- In Week 6, we considered the following equation  $b' \approx b + (R - g)b + d$ . In this equation, the difference between the interest rate  $R$  and the growth rate  $g$  plays a key role for sustainability. In particular a **negative** value of  $(R - g)$  is desirable as it lowers the next period debt to GDP ratio. If you want to comment on  $(R - g)$  you can use the World Bank WDI. Specifically to compute  $R$  you can use the variable: **FR.INR.LEND** (Lending interest rates (%)); For  $g$  you can use the variable: **NY.GDP.MKTP.KD.ZG** (Growth rates GDP (annual %))
- Feel free to check in with me at any time. This is not an easy question.

**Grading Rubric**

When grading this question, I will ask myself the following questions:

1. Is the report showcasing that the group has learned from the course?
2. Is the report organized and cohesive?
3. Is the correct terminology and data used in the analysis?
4. Are graphs and equations well formatted?
5. Is the analysis well documented (data sources etc.)