

INTERMEDIATE MACROECONOMICS

Econ 3102-002

University of Minnesota

Department of Economics

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DATA EXERCISE

In this problem set you will analyze the performance of macroeconomic variables in a particular country. You will need to apply the growth accounting and business cycles topics we covered during class. I suggest you use the OECD statistics database, <http://stats.oecd.org/>, but you are free to use a different trustworthy database. The country you will analyze will be either Norway or Canada. Pick one country which is not familiar with you. Make sure to have enough data of the series I ask you to download. Finally, if you work in groups, be sure to acknowledge the people you work with. Nevertheless, be aware that identical homeworks will not be tolerated. I expect you to deliver a paper copy with the answers and also the excel tables printed in the end of the document as an annex.

1 Growth Accounting

Download the following annual data in order to do your growth accounting analysis:

- Gross Domestic Product expenditure approach, current prices (1970-2012)
- Gross Domestic Product expenditure approach, constant prices (1970-2012)
- Gross Capital Formation, current prices (1970-2012)
- Working-Age Population, 15-64 (1980-2012)
- Average Annual Hours Actually Worked-per-Workers (1980-2012)
- Total Employment (1980-2012) : Average annual hours \times Working-age population.

Assume that the share of capital in production matches the parameter values of the US.

- a) Compute the GDP deflator. Transform the investment nominal series into real series using the GDP deflator. Plot the GDP deflator series. What can you say about inflation in the country?
- b) Use capital series computed by perpetual inventory method, calibrate the series of total factor productivity using the Solow's residual. What is the average growth rate of total factor productivity from 1980 to 2012 (discrete time growth rate)?
- c) Perform a Solow's growth accounting decomposition. Create a table in which you express how much is the growth of GDP explained in percentage by their decomposition factors.
- d) Graph these percentage series throughout time. Can you distinguish important periods in the country? Research and explain what can possibly explain this?
- e) Perform a Kehoe-Prescott's growth accounting decomposition. Create a table in which you express how much is the growth of GDP-per-capita explained in percentage by their decomposition factors. Does your country present evidence of being in a balance growth path? Explain your reasoning.
- f) Consider the four series in Kehoe-Prescott's growth accounting. Divide each element of the series by the first value of it and multiply by 100%. Graph these percentage series throughout time.

2 Business Cycle

Download the following annual data in order to do your business cycles analysis:

- Gross Domestic Product expenditure approach, current prices (1970-2012)
- Gross Domestic Product expenditure approach, constant prices (1970-2012)
- Gross Capital Formation, current prices (1970-2012)

- Final Consumption Expenditure, current prices (1970-2012)
- Exports of Goods and Services, current prices (1970-2012)

It is important for you to follow the instructions found in HPfilter_excel.pdf unloaded on Moodle in order to add the Hodrick-Prescott filter in your Excel.

Here are steps that you have to follow. We have 4 macroeconomic series (GDP, GCF, consumption, and exports)

1. Compute the GDP deflator. Transform the 4 nominal series into real series using the GDP deflator.
2. Take the natural logarithm to all the series and apply the Hodrick-Prescott filter using a parameter $\lambda = 100$.
3. Compute the deviation components.

Then answer the following questions.

- a) Graph each macroeconomic variable natural logarithm series with its corresponding trend series.
- b) Graph deviation from the trend of GDP, GCF, Consumption, and exports throughout time .
- c) Create a table that compares the standard deviation of each residual series. Which series is the most volatile? Which series is the least volatile?
- d) Draw Scatter-plot of each single residual series against the GDP residual series. (For example, scatter plot of residuals of imports and GDP) Label each macroeconomic variable as procyclical, countercyclical, or acyclical.