ECON 3010 Intermediate Macroeconomic Theory
Solutions to Homework #1
Due: Thursday, February 13, 2020

#1. Ten Sapling multiple-choice questions. You have unlimited attempts to complete the assignment and they are due at midnight on the date above.

The written questions below are due at the beginning of class and should be typed.

#2. Go to the Federal Reserve Economic Database (www.research.stlouisfed.org/fred2/) and print out graphs for the following five macroeconomic time series:

- Nominal GDP (Hint: FRED does not use the terminology ‘nominal’.)
- Annual real GDP growth rate
- GDP deflator
- Annual CPI growth rate
- Unemployment rate

a) For each variable, provide enough information about the time series that someone could find the exact data in FRED and replicate the graph (e.g., sample period, seasonal adjustment, frequency, etc.). Use the longest sample period available on FRED.

b) For each variable, discuss one key feature of how the variable moves over time. There is no right or wrong answer here; just your opinion based on looking at the graph.

Quarterly, Seasonally Adjusted Annual Rate, GDP, Billions of Current Dollars
Annual, Not Seasonally Adjusted, Annual Real GDP Growth Rate

Quarterly, Seasonally Adjusted, GDP Implicit Price Deflator

a.  
2010 (Base year)
Nominal GDP = (200 x $2) + (200 x $3) = $1000
Real GDP = (200 x $2) + (200 x $3) = $1000
GDP Deflator = ($1000/$1000) x 100 = 100
CPI = ($1000/$1000) x 100 = 100

2015
Nominal GDP = (250 x $4) + (500 x $4) = $3000
Real GDP = (250 x $2) + (500 x $3) = $2000
GDP Deflator = ($3000/$2000) x 100 = 150
CPI = ($1600/$1000) x 100 = 160

b.
Price increase Hot Dogs = ($4 - $2)/$2 x 100 = 100%
Price Increase for Hamburgers = ($4 - $3)/$3 x 100 = 33.33%
GDP Deflator Inflation Rate 2015 = ((150 – 100)/100) x 100 = 50%
CPI Inflation Rate 2015 = ((160 – 100)/100) x 100 = 60%

The increase was greater for the CPI (Laspeyres Index) because the basket of goods is fixed. Notice that the price increase was greater for hot dogs than hamburgers. Rational consumers will substitute away from hot dogs towards hamburgers. This substitution effect is captured by the GDP deflator (Paasche Index), but not the CPI.

#4. Go to FRED and find the most recent data on the labor force, population, and unemployed. Use these figures to calculate i) the labor force participation rate and ii) the unemployment rate. Do your figures match the rates presented by the U.S. Bureau of Labor Statistics?

Solution. As of January 2020, FRED and the BLS have …

- Labor force = 164,606,000
- Population = 259,502,000
- Unemployed = 5,892,000

Using these numbers, we can calculate …

- The labor force participation rate is 164,606,000/259,502,000 = 63.43%
- The unemployment rate is 5,892,000/164,606,000 = 3.6%

Yes, these figures match those on the BLS website.