**ECON 3010 Intermediate Macroeconomic Theory**
Solutions to Homework #7

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

Also, provide type-written answers to the following questions:

1. Create a scatter plot of annual U.S. and Wyoming unemployment rates from 1976 - 2019. Calculate the best-fitting trend line and the correlation between the two unemployment rates. Use the results to write a paragraph commenting on the relationship between Wyoming's economy and that of the U.S. macroeconomy. In particular, comment on the often-mentioned countercyclical nature of Wyoming's economy and the natural rate of unemployment in Wyoming.

Solution. The scatter plot below shows that there is actually a weak positive relationship between the unemployment rates in the U.S. and Wyoming. In this sense, Wyoming's economy is pro-cyclical rather than counter-cyclical, as often stated.
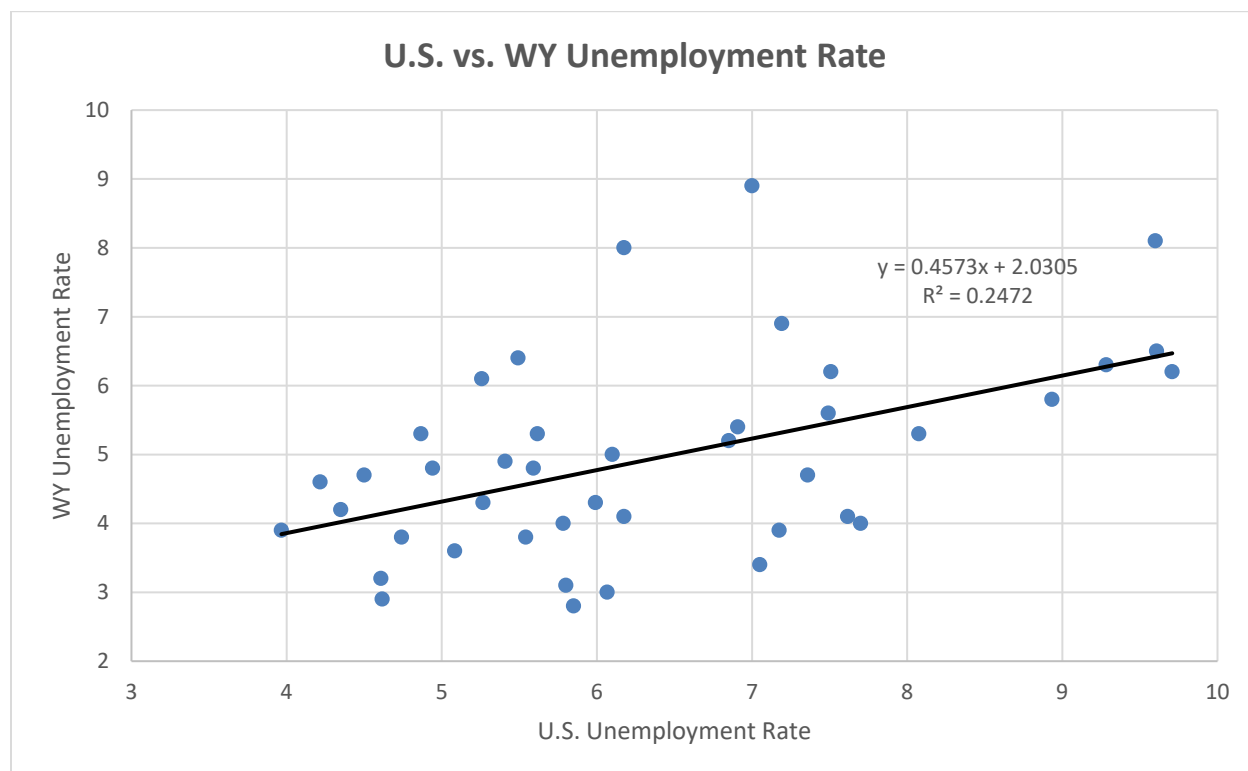
2. Replicate the scatter plot of Okun's law for Wyoming, commenting on the differences between the relative intercepts and slopes.

Solution. **The intercept and slope for Okun's law from the lecture notes are 3 and -2, respectively. This means that when the unemployment rate is not changing, real GDP growth is 3% on average. Also, a one percentage point increase in the unemployment rate is associated with a two percentage point drop in real GDP growth.**

To calculate a similar plot of Okun's law for Wyoming, I went to the Division of Economic Analysis and downloaded data on (nominal) total personal income, which is available starting in 1976. Then I divided by the national CPI to estimate real personal income and finally calculated percentage changes. This is the proxy for the growth rate in WY's real GDP.

The graph below shows a similar pattern for Wyoming, although both the intercept and slope are of a slightly lower magnitude.
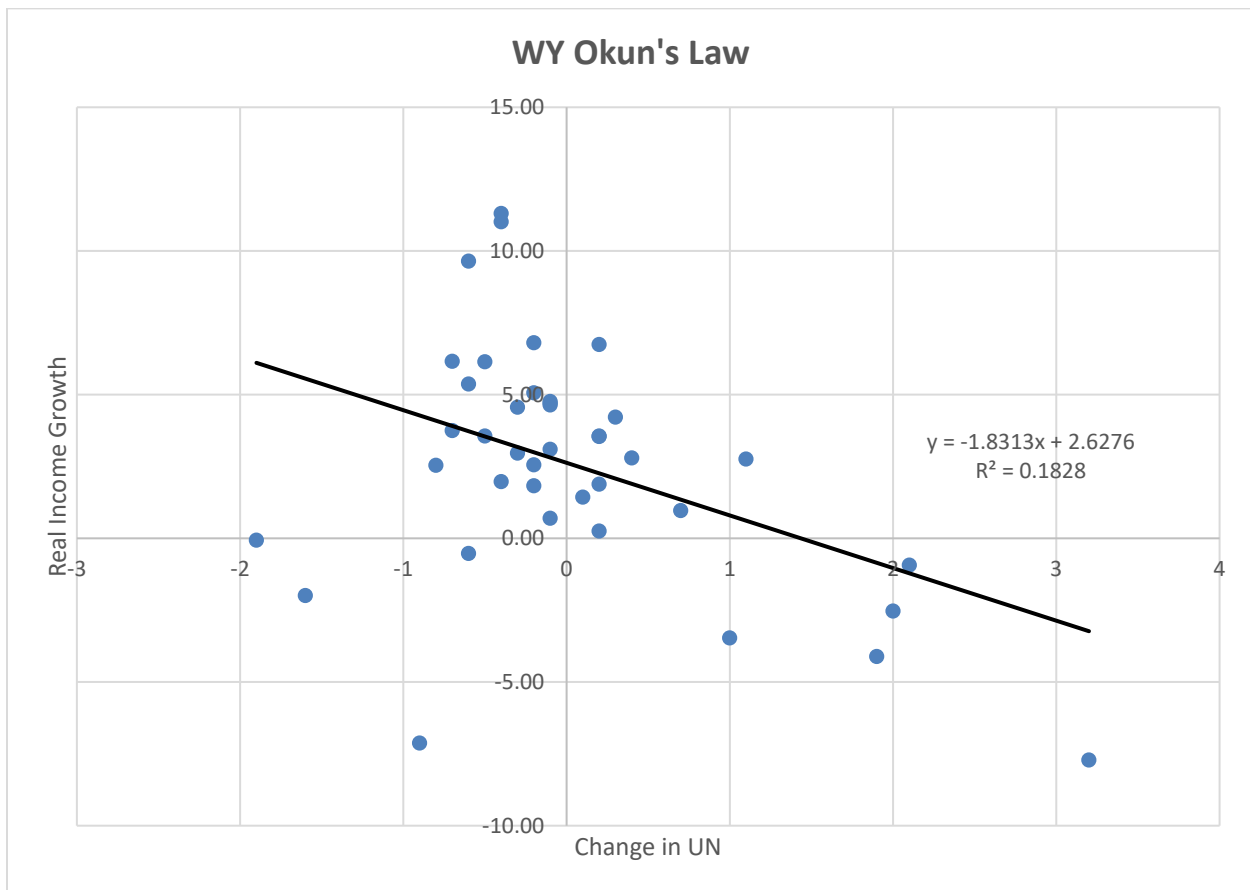
3. Use the AD-SRAS-LRAS model and diagram of chapter 10 to explain the impacts on the economy from COVID-19 and the transition back to a long-run equilibrium.

Solution. See the figure below. The effect of COVID-19 is to cause an adverse supply and demand shock. This will cause the economy to shift from its initial equilibrium at point A to point B, where output falls and the price level rises. In the absence of any stabilization policy, the model predicts that wages and prices will fall eventually fall due to accumulated inventories and higher unemployment. The SRAS curve will then shift down to eventually return the economy back to its natural rate of output and employment.