Practice Problems for the DMP Model*

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June 28, 2017

*These problems are based on the model presented in our paper *Revisiting Unemployment in Intermediate Macroeconomics: A New Approach for Teaching Mortensen-Pissarides*. Email addresses: arghyab@uci.edu, pjackso1@uci.edu, and bcjenkin@uci.edu.

1 Empirical Problems

The following questions are based on US labor market data available at:

http://www.briancjenkins.com/dmp-model/data/beveridge_curve_data.csv

These questions are designed to be answered using a spreadsheet tool like Microsoft Excel or Google Sheets.

1. The unemployment rate is the ratio of unemployed persons to the labor force. Create a new column containing the unemployment rate expressed as a percentage.[1]

   (a) Construct a well-labeled line plot of the unemployment rate for the US.

   (b) In which month and year was the unemployment rate in the US the highest? What was the value of the unemployment rate in that month?

   (c) In which month and year was the unemployment rate in the US the lowest? What was the value of the unemployment rate in that month?

   (d) What is the average rate of unemployment for the US?

2. Labor market tightness is the ratio of job vacancies to the number of unemployed persons. Create a new column containing labor market tightness expressed as a simple ratio.[2]

   (a) Construct a well-labeled line plot of labor market tightness rate for the US.

   (b) In which month and year was labor market tightness in the US the highest? What was the value of labor market tightness in that month?

   (c) In which month and year was labor market tightness in the US the lowest? What was the value of labor market tightness in that month?

   (d) What is the average labor market tightness for the US?

3. The Beveridge curve I. In this problem, you will look at the long-run behavior of the unemployment rate and labor market tightness in the US.

   (a) Using the unemployment rate and labor market tightness data that you've already constructed, make a well-labeled scatter plot with the unemployment rate on the horizontal axis and market tightness on the vertical axis. Set the limits for the x-axis to $[-0.5, 26]$ and set the limits for the y-axis to $[-0.5, 5]$.

[1] I.e., Unemployment rate $= \frac{\text{Unemployed}}{\text{Labor force}} \times 100$

[2] I.e., Labor market tightness $= \frac{\text{Vacancies}}{\text{Unemployed}}$

(b) Based on the figure that you created in the previous question, describe in words the apparent relationship between labor market tightness and the unemployment rate.

4. The Beveridge curve II. In this problem, you will look at the behavior of the unemployment rate and labor market tightness in the US over the Great Recession of 2007-09 and the subsequent recovery.

   (a) Between December 2007 and August 2016, in which month and year was the unemployment rate in the US the highest? What was the value of the unemployment rate in that month?

   (b) Between December 2007 and August 2016, in which month and year was the unemployment rate in the US the lowest? What was the value of the unemployment rate in that month?

   (c) Make a well-labeled scatter plot with the unemployment rate on the horizontal axis and labor market tightness on the vertical axis using only data from December 2007 through August 2016. Set the limits for the x-axis to $[4, 11]$ and set the limits for the y-axis to $[4, 0.5]$.

   (d) From December 2007 through August 2016, did the plotted unemployment rate-market tightness combinations move in a clockwise or counterclockwise direction?