ABSTRACT

The purpose of my sabbatical was to investigate whether or not using the Phillips Curve to track current economic events (instead of the AD-AS model that is typically the model taught in a Principles of Macroeconomics course) was a feasible alternative for a student semester-long project. I found that a worthwhile project could be developed that would get students involved in current events and energize their discovery and analytical talents. The Phillips Curve’s tracking variables – year-over-year inflation rate based on CPI and the unemployment rate - and are received in a more timely and more reliable manner than the AD – AS variables (Real GDP and GDP implicit price deflator). Both current data and previous data are used to emphasize these points.

THE PROBLEM

In a one-semester macroeconomics course, students find it difficult to track the economy. The reasons for this are, for the most part, twofold. One is due to the compact, 15-week term, which is even more of a problem in short semesters. The other is that the typical principles of macroeconomics class uses the Aggregate Demand-Aggregate Supply (AD-AS) Model as a basis for analysis.

To resolve the first problem, that of a limited amount of time, it is imperative to use timely data. The unemployment rate and the inflation rate are timelier than Real Gross Domestic Product (RGDP) and the Implicit Price Deflator.

There is a more serious drawback to using the AD-AS Model to track current events. While a new price index can be obtained monthly, it is the Consumer Price Index (CPI), not the Implicit Price Deflator. RGDP is measured quarterly. GDP data for a quarter comes out in the advance report one month after the end of the quarter. It is usually substantially revised in the preliminary report issued one month after the advance report and in the final report another month after that. Thus the final RGDP number for, say, the second quarter is not available until the end of the third quarter (Clayton, 1995). Further, since the Implicit Price Deflator rarely, if ever (depressions excluded), decreases, the AD-AS Model cannot depict a leftward shift in AD or a rightward shift in short-run AS. Consequently, the AD-AS Model is simply not a useful diagnostic tool for use in tracking current economic events.

PROPOSAL

I propose using the Phillips Curve as the model for the students to use to track current events. The Phillips Curve is a relationship between the unemployment rate and the inflation rate. The Phillips Curve can be shown to be the mathematical mirror image of the short-run AS curve (Mankiw (1), 2000). The relationship between unemployment rate and RGDP is described by Okun’s Law (Mankiw (2), 2000). The inflation rate is the first derivative (with respect to time) of a price index. Thus, a point on the Phillips Curve is equivalent to the intersection of AD and short-run AS in the AD-AS Model.

The Phillips Curve variables are the unemployment rate and the inflation rate. Both of these variables are reported monthly, within three weeks after the end of the reported month. The percent of variation (due to collection methods) explained in the first release is 99 percent for the Consumer Price Index (CPI) and 100 percent for the unemployment rate. These variables are not revised. In contrast, the initial report of RGDP explains only 78 percent and the initial report of the Implicit Price Deflator explains only 88 percent of the variation in the data as compared to the final report (Koenig, 2006). Thus, the two principle variables for the Phillips Curve are received in a more timely manner and with a greater reliability that the variables in the AD-AS Model.
As shown in Figure 1, the Phillips Curve can show all possible movements: both inflation and unemployment rising (equivalent to short-run AS shifting left), both inflation and unemployment falling (equivalent to short-run AS shifting right), unemployment rising and inflation falling (equivalent to AD shifting left) and unemployment falling and inflation rising (equivalent to AD shifting right).

The student obtains monthly reports of inflation and unemployment from the Bureau of Labor Statistics website (http://www.bls.gov). These data are plotted and analyzed. While there is “chatter” in the data due to data collection errors, significant movements stand out much more clearly than on an AD-AS Model.

Once the data is plotted and the movements determined, the students would then search for reasons why the data stream moves the way it does. For example, why AD shifted to the left or right or why the short-run AS shifted to the left or the right. Also, the student would search for reasons why these shifts started and why they stopped.

**A RECENT CASE**

The following is shown in Figure 2. From January 2006 to June 2006, the economy hovered near 3.5%- 4% for inflation and 4.6%-4.8% for unemployment, shifting back and forth along one Phillips Curve. This is an excellent example of a stable economy with “chatter” in the data. Then, between July 2006 and October 2006, there was a significant shift to 1% for inflation and 4.4% for unemployment, finally settling near 2.5% for inflation and 4.5% for unemployment by January 2007. Between January and July, 2007, the inflation rate hovered near 2.3%-2.8% and the unemployment rate was near 4.4%-4.6%, shifting back and forth along another Phillips Curve. This is another example of a stable economy with only “chatter” in the data stream. Then from August to November 2007, another significant shift in the Phillips Curve occurred, as inflation rose from 2% to 4.3% and unemployment rose from 4.6% to 4.7%. Finally, in December 2007, the economy moved downward and to the right on its new Phillips Curve. Had a new recession started? What caused this significant movement? As we all know now it indeed was the beginning of a recession; one that started slowly and then deepened in the fall of 2008.

What would the students have to do in this example? After gathering and plotting recent data, they would identify periods of economic stability (as evidenced by “chatter” periods) and periods of significant change, as evidenced by shifts in the Phillips Curve or movements along the Phillips Curve. Finally, they would research why such significant moves began and ended.

If the students instead used the AD-AS Model for the same period of time, they would see only the inexorable trek of the plotted point to the northeast as both Real GDP and the Implicit Price Deflator increased (Figure 3). On the AD-AS diagram, there is no evidence of any movement of any significance.

**A CASE FROM THE PAST**

I applied this technique to diagnose economic events of the past. One of the recent economic mysteries was the “jobless recovery” in the early 1990’s during the G. H. W. Bush administration. Using only the AD-AS Model, figure 4 shows, as usual, the steady march toward the upper right. Using the Phillips Curve Model (figure 5), one can see that the recession began with a left shift of AS (right shift of the Phillips Curve), followed by a left shift in AD (a movement along the Phillips downward and to the right). The start of the left shift in AS began when President G. H. W. Bush broke his “no new taxes” pledge in June 1990. Did this trigger a decrease in confidence in the business community and start the economy down the slippery slope?

Using the Phillips Curve analysis technique, it can be shown that the technology-induced growth during the 1980s and 1990s was sporadic, with periods of two-year shifts of AS to the right (Phillips Curve to the left) interspersed with periods of two years or so of AD shifting right (movement along the Phillips Curve).

I use the Phillips Curve Model exclusively in the macroeconomics portion of the Introduction to Economics survey classes (ECON 1301). The intro students find it much easier to understand and to see exactly what is happening in the economy when the Phillips Curve Model is used. The economy moves along the Phillips Curve when a change in aggregate expenditures dominates, equivalent to a shift in AD on the AD-AS diagram. The Phillips Curve shifts when any change in the incentive and/or the capability to produce dominates, equivalent to a shift in short-run AS on the AD-AS Model. When we use the Phillips Curve Model, there are fewer lines on the graph and a more straightforward explanation can be backed up by actual data.
There would be no loss of rigor if this same technique were used in the Principles of Macroeconomics class (ECON 2301) as a supplement to the traditional AD-AS analysis. In fact, it would be especially enlightening if it were the research basis of a term paper for the Principles students.

SUMMARY

During my sabbatical research, I found that it is easier to track current economic events using the Phillips Curve Model. The tracking variables, inflation rate and unemployment rate, are timelier, more frequently reported, more accurate, and more representative than the variables of AD-AS. On the Phillips Curve model, the variables actually do move both upward and downward. In contrast, one variable in the AD-AS Model - the Implicit Price Deflator - moves only upward. The plot of data used in the Phillips Curve Model yields a richer presentation of how the variables change over a period of time and, because of that, induces the students to explore further why the variables change the way they did.

REFERENCES


Figure 1. Economic Movement using the Phillips Curve

The arrows show movement using the Phillips Curve:

1 - AD shifts right (inflation rises and unemployment falls).
2 - AS shifts right (both inflation and unemployment fall).
3 - AD shifts left (inflation falls and unemployment rises).
4 - AS shifts left (both inflation and unemployment rises).
Figure 2: Economic Movement from Jan 2006 to Dec 2007

Figure 3. Economic Movement from 1Q/2006 to 3Q/2007

Source: www.bea.gov
Figure 4. Real GDP vs. GDP Deflator 1988 - 1992

base year=2000 data source: www.bls.gov

Figure 5. Economic Movement from January 88 to December 92