Global Economy Final Exam: SOLUTIONS
Tuesday, June 25, 2013

Part I (80 points): Answer 8 of the following 10 questions. Each question is worth 10 points. Using arguments based on the content of this course, explain whether the statement is true or false.

1. The increase in female labor-force participation in the US in the 1960s and 70s had a bigger impact on real GDP measurements than it did on actual real economic activity.

TRUE. Since it was common for women to do valuable work at home, outside the market economy, their contributions to real economic activity went unmeasured by real GDP which is strictly market based. When these women entered the labor force, activities like childcare, food preparation and house cleaning, were then done by hired workers who were paid to provide these services. These new market transactions increased real GDP, but not necessarily real economic activity, since it reflected a substitution of market for non-market activity, and an improved measurement of economic activity, not an increase in that activity.

2. For a standard Cobb-Douglas production function, per capita GDP of 2 when the capital-labor ratio is 1 and average labor productivity is 1, implies that total factor productivity must be equal to 2.

(Note: Sometimes you ask a dumb question. Hopefully, not very often. Unfortunately, this was one of those times.)

FALSE. If K/L is equal to 1, and average labor productivity, Y/L, is equal to 1, then the Cobb-Douglas production function implies that A must also be equal to 1:

$$\frac{Y}{L} = A\left(\frac{K}{L}\right)^{1/3} \Rightarrow 1 = A\,1^{1/3} \Rightarrow A = 1$$

(Weird feature of the numbers in the question: if Y/Pop = 2 and Y/L = 1, then L/Pop = 2, ie, the labor force is twice as big as the population! That's an unbelievable number of nonresident guest workers.)

3. Increases in productivity lower the demand for labor since firms don't have to hire as many workers to produce the same amount of output.

FALSE. Firms make decisions to maximize profits, not simply produce the same amount of output. Therefore, the demand for labor by firms is determined by the marginal productivity of labor. A profit-maximizing firm in a competitive environment will hire workers until MPL = w, where w is the real wage. Increasing productivity, other things equal, implies an increase in the marginal productivity of labor so that MPL > w. Firms, therefore, can increase profits by hiring more of these higher-productivity workers at a given wage rate, hence the demand for labor increases.

4. Interest rates are pro-cyclical, therefore, an upward sloping yield curve is an indicator of a future recession.

FALSE. Yields on long-maturity bonds are an average of the current interest rate and the market's expectation for future interest rates (plus a risk premium). Therefore, when long-

maturity bond yields are above the current interest rate, ie, an upward sloping yield curve, the market is anticipating that interest rates will rise. Since interest rates are procyclical, this implies that they are also anticipating an expansion. If investors are expecting a recession in the future with lower interest rates, the yield curve may still be upward sloping if the risk premium on long bonds is sufficiently high. Therefore, unlike a downward-sloping yield curve, at best an upward sloping yield curve is an ambiguous indicator for future economic activity.

5. Unemployment in Spain is very high and we know that increasing the money supply could stimulate short-run economic activity, therefore, the ECB should increase the money supply to try to lower unemployment in Spain.

FALSE. Monetary policy is conducted at the Euro-zone level: since there is a single currency, there is one monetary policy that applies to all countries rather than country-specific policies. Increasing the money supply could cause inflation on average across the Euro-zone, not just additional employment in some economically depressed regions like Spain. Hence the ECB would not favor a policy that might temporarily stimulate economic activity in one location but create inflation across the entire Euro-zone.

6. Hyperinflation is a monetary phenomenon that has nothing to do with fiscal policy.

FALSE. Hyperinflations have their origins in governments that want to undertake spending programs, but are unable to sell bonds or raise tax revenue to finance this spending, and who then resort to increasing the money supply to finance these fiscal deficits. The net effect of this new money is inflation, and expectations of future inflation, which requires the government to create money at an ever increasing rate to try to finance its spending. The net result of this is hyperinflation.

7. When the Fed follows the Taylor Rule, it raises short term interest rates today when it expects inflation to be relatively high in the future.

FALSE. The Taylor Rule requires the Fed to increase short-term interest rates when current inflation is relatively high, not expected future inflation. This policy will have an effect on expected future inflation through the private-sector's valuation of short-term bonds, but not because of the Taylor Rule itself.

8. A value-added tax is preferable to a large income tax.

TRUE. Since a value-added tax applies a low tax rate across all goods and services in the economy, it typically implies a smaller loss of efficiency than a large tax applied to income. A large income tax places a heavier burden on labor income, which can distort growth-enhancing decisions like physical and human capital accumulation.

9. A government can stimulate current consumption expenditures by households by running a deficit and transferring the income to households through lower taxes.

FALSE. A government deficit is, by definition, a future tax liability. A deficit-financed tax cut will not affect consumer's wealth, hence, will not affect their current consumption decisions. (For this statement to be true, there must be some kind of substantial friction that someone allows consumers to ignore their future tax liability, such as an inter-generational friction in which current consumers try to force the tax burden onto future generations.)

10. Uncovered interest rate parity implies that countries with high interest rates tend to have currencies that appreciate over time.

FALSE. Uncovered interest-rate parity implies the opposite. Investors will attempt to borrow in low interest-rate countries and lend in high interest-rate countries (ie, the so-called carry trade). UIC says that these profits will be zero on average since the currency of the high interest-rate country will depreciate in value over time eliminating the perceived profits.

Part II (75 points): Answer all parts of all questions.

1. Between 1973 and 2008, Jamaica and Barbados had very different growth experiences even though they have a lot in common both geographically and historically. In fact, they share almost identical legal and political institutions inherited from their British colonial experiences. Yet average annual growth in GDP per capita in Barbados was 1.36% but only 0.27% in Jamaica. (All data are from the Penn World Tables 7.0, and all growth rates are continuously compounded.) Capital per worker showed little growth in either country over this period, with average annual growth of 0.18% in Barbados and 0.12% in Jamaica. Total factor productivity grew very little in Barbados with an average annual increase of 0.21%. In Jamaica, TFP fell on average at annual rate of -0.16%.

a. Assuming that each countries aggregate production is well-described by a Cobb-Douglas production function with a capital share parameter equal to 1/3, how do you account for average standards of living in Barbados growing so much faster than in Jamaica? What is the average annual growth rate in average labor productivity across the two countries? (10 points)

Average labor productivity, Y/L, has growth driven by growth in K/L and A:

$$\gamma_{Y/L} = \gamma_A + (1/3)\gamma_{K/L}$$

For Barbados, this implies a growth rate of 0.21 + (1/3)0.18 = 0.27%. Therefore, for Barbados, the growth in labor participation must have been 1.36 - .27 = 1.09%

For Jamaica, the growth in Y/L was -0.16 + (1/3)0.12 = -0.12%. Therefore, for Jamaica, the growth in labor participation must have been 0.27 + 0.12 = 0.29%.

The biggest factor in the different growth experiences, therefore, was labor participation, which grew on average 0.8% per year faster in Barbados. TFP differences was the other important factor, with Barbados experiencing TFP growth that was 0.37% faster per year on average.

b. Over this time period, Jamaica had strong labor unions, foreign trade restrictions and an unstable currency. Barbados had wage increases determined by productivity increases, liberal trade policies, and a very stable currency. Do these differences matter? Which of these differences seems to matter the most? (10 points)

All of these factors contribute to differences in productivity growth. Labor market frictions and foreign trade restrictions have a direct effect on the efficiency of production. With fewer restrictions in labor markets and foreign trade relative to Jamaica, Barbados was able to use capital and labor more efficiently. A stable currency would be helpful for attracting foreign investment, however, growth in the capital stock was not much higher in Barbados than in Jamaica over this period, hence this is less likely to have played a significant role. Since the

biggest difference was in labor participation, it would appear that labor market frictions that kept people out of the labor force in Jamaica mattered the most.

2. In the US in 2008, prices fell, output fell, investment fell, and employment fell.

a. Evaluate the possibility that these co-movements were caused by eliminating a distortion in the housing market that had been causing over-investment in residential housing so that capital and labor could then be reallocated to more productive uses. (10 points)

In the real business cycle model, the reallocation of capital and labor to more productive uses would result in a temporary increase in total factor productivity. In turn, this would increase the demand for investment and the demand for labor by firms, but would not have much of an affect on either private savings or the supply of labor. The consequence of the TFP improvement would be to increase employment, investment and output, which does not match the facts from 2008.

b. If the goal is to achieve low and stable inflation, how should monetary policy respond to the events described in part a. (5 points)

According to the quantity theory, to keep prices stable in the face of increasing economic activity, they monetary authority should reduce the money supply.

c. As an alternative to the scenario in part a., evaluate the possibility that these co-movements were caused by a loss in confidence in financial institutions causing a large decrease in velocity. (10 points)

A decrease in velocity would tend to lower prices. As prices fell, firms might be confused about the source of this price changes and mistakenly attribute the change to lower demand, and hence mistakenly lower output, employment and investment. This seems to match the events of 2008 fairly closely.

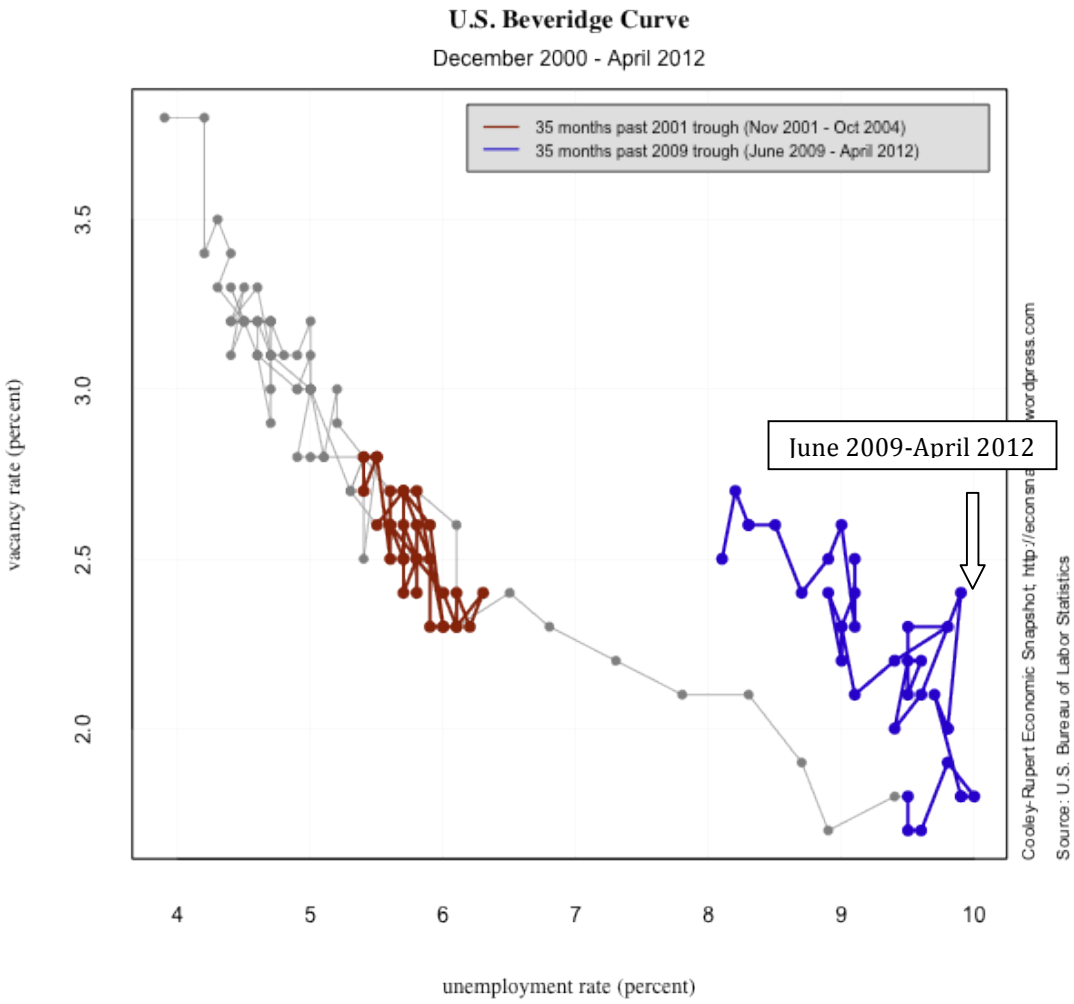
d. If the goal is to achieve low and stable inflation, how should monetary policy respond to the events described in part c. (5 points)

The monetary authority should increase the money supply to offset the reduction in velocity and keep prices stable.

3. The “Beveridge Curve” plots the job vacancy rate against the unemployment rate. Below is the Beveridge Curve for the US economy over the last 10 years. The pattern on the far right side of the graph (ie, the most recent three year’s worth of data) suggests that the relationship between job vacancies and the unemployment rate in the US has changed relative to its historical pattern. There could be three reasons for this:

    1. less willingness to accept job applicants by firms,
    2. less willingness to accept jobs by unemployed workers, or
    3. more mismatch, namely less compatible combinations of characteristics of vacant jobs and workers.

    Discuss which changes in the US economy, including changes government policy, have affected these three factors to create the shift that we see in the data. How have these changes affected TFP? (15 points)



1. There are lots of candidates for why firms may be less willing to accept a match: persistently low interest rates lower the cost of waiting, and increases in volatility increase the option value of waiting, as does uncertainty about future government mandated benefits such as the ACA ("Obamacare").

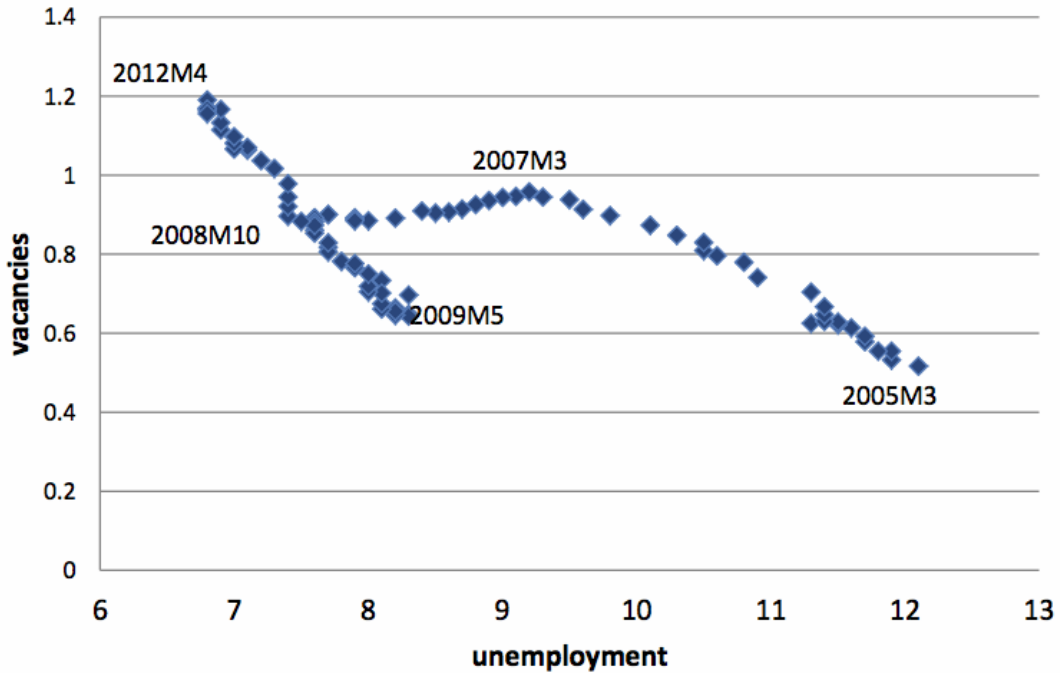
2. The unemployed may also be less willing to accept jobs that represent a lower-quality match for them. The extension of unemployment benefits to about 2 years, ie, it's less costly for workers to wait for a better job match, and the increased rate of home ownership in the US, ie, workers are less geographically mobile, both work in that direction.

3. We frequently see increases in the mismatch of skills in the US with the increase in health-care jobs and the decrease in construction jobs, for example.

All of these act to change the relationship between vacancies and unemployment – high vacancies are now more likely to coexist with high unemployment – as we see in the US data. In addition, since these all represent an increase in labor market rigidities, labor markets in the US are doing a worse job of matching workers to jobs, hence more work effort is left unproductive. This acts to lower aggregate TFP.

4. The Beveridge Curve for Germany has recently exhibited a shift as well, depicted in the graph below. Germany undertook reforms over this period that relaxed employment protection laws, reduced unemployment benefits to the long-term unemployed and lowered social insurance taxes, and reorganized public employment services to be more responsive to market conditions and the need for re-training of unemployed workers. Discuss how these changes affected the three factors that determine the Beveridge curve (listed in question 3 above), and how they created the shift in the curve observed in the data. How have these changes affected TFP? (10 points)

Figure 8. The German Beveridge curve, 2005M1-2012M4



Reforming employment protection laws and other restrictions built into all labor contracts, increases the willingness of firms to accept a match.

Reducing unemployment benefits while lowerin social insurance taxes acts to increase the willingness of a worker to accept a match.

Reorganizing public employment services to be more responsive to market conditions, and increased training programs, reduces the chance of a mismatch.

All of these changes resulted in the movement in the German Beveridge curve that was the opposite of what we saw in the US. Germany's more flexible labor markets are doing a more effective job allocating work effort, and this shows up as an increase in efficiency for the German economy, ie, and increase in aggregate TFP.