Macroeconomic Theory

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Suggested Answers to Midterm Examination # 1

1. W/P = d0 –d1\*L + d2\*K + d3\*RM (1) **Endogenous Exogenous**

Ls = so + s1\*(W/P) - s2\*T (2) W, P, L, Ls, Y K, RM, T

L = Ls (3) AD, C, I M, k, G

Y = 100\*L.7K.3  (4)

AD = k\*M/P (5)

AD = C + I + G (6)

C = .8\* (Y-T) (7)

Y = AD (8)

a. Solve equations 1 – 3 jointly to determine L.

Plugging 1 into 2 yields

L = so + s1\*(do – d1\*L + d2\*K +d3\*RM) -s2\*T which can be solved to yield

L\* = so + s1\*do + s1\*d2\*K + s1\*d3\*RM - s2\*T

1 + s1\*d1

b. Plug the result into equation 4 to yield the reduced form equation for output

Y\* = 100\*[so + s1\*do + s1\*d2\*K + s1\*d3\*RM - s2\*T ].7K.3

1 + s1\*d1

c. Same answer as b. Note that prices (P) do not appear in this equation; so the slope is infinite.

d. The earthquake leads to a decline in K which shifts in both the labor demand curve and the production function. From the L\* result above, we see that L falls when K falls; from the Y\* result, we see that Y falls when K falls. If we plug the new L\* into (2), we see that real wages fall since the right hand side must fall. To determine the effect on the price level, set (5)=(8) to yield Y = k\*M/P. Since Y\* falls, the right hand side must fall; therefore, P must rise.

e. A fall in taxes affects positively affects labor supply. From the L\* result, since there is a negative coefficient in front of T, L would rise; a similar result holds for Y from the Y\* equation. From equation (1) since L rises, W/P would fall. Since Y has increased, AD must increase. Again, setting (5) = (8), we see that the left side would rise. To make the right hand side rise, P must fall.

2. a. CPI - P2Q1 = 118,000 ; P1Q1 = 110,000; thus, the CPI would increase by

118,000 – 110,000 \*100 = 7.27%

110,000

b. GDP(variable weight) Deflator - P2Q2 = 168,000 ; P1Q2 = 175,000; thus the GDP Deflator would fall by

168,000 – 175,000 \*100 = -4.00%

175,000

c. The chain weight index comes from the following equation

CWPI = sqrt(1 + P(cpi)gr + 1 + P(gdp)gr) – 1 = sqrt [(1.0727)\*(0.96)] – 1 = .0148

So the chain weighted index grew by 1.48%

3. a. The trade weight average for the Eurozone comes from multiplying the ratio of the exchange rate in 2011 to that in 2000 by its trade share; thus,

TWER = .25\*(9.44/7.94) + .25\*(121.95/102.56) + .5\*(1.44/.96) = 1.345 so the TWER rose by 34.5% from 100 in 2000 to 134.5 in 2011.

b. REX = e \* P(Euro)/P(US)

In growth rate terms REX growth = e growth + P(Euroz)growth – P(US)growth

Thus, REX growth = (1.44 - .96) + (111.5 – 90.2) - (221.3 – 171.3) = .444 (44.4%)

.96 90.2 171.3

Part II.

4. Model 1 yields the prediction that the quantity of money in the system has no effect on any real variables including Y, W/P, L, and C. This clearly contradicts the notion that money is powerful and important. Its role in Model 1 is to make transactions costs disappear. Furthermore, Model 1 presumes that the velocity of money, that is the ratio of the nominal GDP (P\*Y) to the stock of money, is a constant (v = 1/k). To predict the effects of money on the real economy, we need to understand how central bank policy (which controls a narrow measure of money such as M0) affects a broad measure of money (such as M2) as well how that affects real GDP (Y) and employment (L). These relationships are froth with uncertainty.

5. To put the April 1, 2011 report in context, one must compare the results with previous periods including the values for the key variables during the 2007-2009 recession, during other recessions, and during more normal periods. Though provision of definitions is essential to understand the situation, it is not sufficient. See the table below for examples. You might pick other indicators or note other information you would like to know such as the mean duration of unemployment and other measures of unemployment (such as U6.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Unemployment Rate (U3) | Employment Ratio | Labor Force Participation Rate | U 6 |
| March 2011 | 8.8% | 58.5% | 64.2% | 15.7% |
| 2009 | 8.5% | 59.9% | 65.5% | 15.6% |
| 2006 | 4.8% | 62.9% | 66.1% | 8.4% |
| 2001 | 4.0% | 64.3% | 67.6% | 7.6% |
| 1993 | 6.9% | 61.3% | 66.0% | ? |
| 1982 | 9.7% | 56.5% | 64.0% | ? |

Clearly, the most recent report suggests that the US labor market has improved from its low point, but has not yet made its way back to more stable, normal times. Since civilian labor force growth per year is approximately 1% or roughly 125,000 per month, the 216,000 growth in March is a positive result.

6. The real interest rate, nominal interest rate minus the expected rate of inflation, equilibrates the loanable funds market. Essentially, it will rise when loanable funds demand exceeds loanable funds supply, and will fall when loanable funds demand falls short of loanable funds supply. When governments spend more than they collect in taxes, they must borrow the funds to fill the gap. The central bank might choose to print money and not let these loans be marketed to the public. Over time, the result would be a higher price level. If these Treasury securities are sold to the public, they reflect an increased demand for private savings which pushes up interest rates and crowds out private investment and consumption. The split between the two depends upon whether the supply of private loanable funds is positively related to the real interest rate.

r Loans Supply

Loans Demand

I2 I1 Total Loans

One could also represent public borrowing as reduced total savings. Graphically, this would be a shift in loans supply towards the r axis which would result in both higher real interest rates and a smaller amount of private loans.