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Econ 105: Final Examination Postmortem

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Part I: [40points]

1.   The Bureau of Labor Statistics reports on its home page [http://www.bls.gov/eag.table.html] that in November the labor force was 138,253 thousand, unemployment was 6,099 thousand and the unemployment rate 4.4%. Therefore, $E = LF - U = 132,154,000$; Unemployment rate $= U/LF$; Labor Force Participation rate $= LF/$(non-institutional population age 16 and over).

2.   Both "accounting profit" and "economic profit" are the excess of revenue over cost, but economic profit includes the opportunity costs of owner-supplied services and capital. Accounting profit is affected by accelerated depreciation and other tax avoidance techniques designed to reduce taxable income; economic profit is free of such distortions.

3.   The function showing profits as a function of q_h and q_n is:

$$\pi(q_n,q_h) = p_n q_n + p_h q_h - C(q_n,q_h) = (20 - q_n/4)q_n + (10 - q_h/2)q_n - [10 + 2(q_n + q_h)]$$

   b.   Partially differentiate to maximize profit: $\partial\pi/\partial q_n = 20 - 2q_n/4 - 2$, or $q_n = 36$; substituting into the demand function reveals that $p_n = 11$. Similarly, $p_h = 6$.

4.   Sam's real income increased from $\$20,000/1.00 = \$20,000$ to $\$90000/4.00 = \$22,500$, both measured in dollars of 1980 purchasing power. Sam paid a real rate of interest of $8\%-7.2\% = 0.8\%$, or more accurately, $(8\%-7.2\%)/1.072 = 0.75\%$. He realized a capital gain of $\$200,000$ when he sold the house in year 2000. Before selling the house he had an "unrealized" gain. Only realized gains are subject to the capital gains tax (and there is an exemption for owner occupied housing).

Part II.   (40 points)

1.   I, G, and X are the *ex*ogenous variables.

   $C = c_o + c_1 d_0 + c_1 Y$ (Consumption out of GDP)
   $Y = C+I+G+X-M = c_o + c_1 d_0 + c_1 Y + I + G + X - (m_0 + m_1 Y)$
   Subtracting $c_1 Y - m_1 Y$ from both sides leads to the reduced form equation
           $Y = 1/(1-d_1+m_1) (c_o + c_1 d_0 + I+G+X-M)$

   Since $\partial Y/\partial G = 1/(1-d_1+m_1)$, a $\$10$ billion decline in G causes Y to decline by $10/(1-d_1+m_1)$. This will cause the balance of trade, (X-M), to increase by $m_1 [10/(1-d_1+m_1)]$.

   To generate the IS curve (GDP plotted on the abscissa; the interest rate on the ordinate) one converts the exogenous variable I to an endogenous variable by adding the investment equation explaining I as a function of the rate of interest: I(r). Substituting into the reduced form equation yields the IS function: $Y = 1/(1-d_1+m_1) [c_o + c_1 d_0 + I(r) +G+X-M]$.

2.   Disposable income: roughly "take-home" pay or the part of national income people have to spend after taxes. It is GDP less (depreciation and corporate retained earnings and taxes) plus (transfer payments (e.g. social security benefits) and subsidies and government interest payments). [As calculated by the Department of Commerce it excludes capital gains even though the capital gains tax is subtracted out! This means that the official savings rate is an underestimate.]

2.   When the Fed purchases $\$100$ million of government securities on the open market it pays for them by increasing bank reserve deposits; now the banks have an extra $\$100$ million on deposit at the Fed. If the banks were originally "loaned up" (i.e. had no excess reserves) they will now have $\$100$ million of excess reserves. The banks can put these excess reserves to work by loaning them to the private sector. Excess reserves will shrink to zero only after 1/(required reserve

ratio)x$100 million = $1 billion of loans have been made. Thus the money supply will increase by $1 billion as a result of the open market operation.

3.   The increase in the money supply will generate inflation. It may benefit pensioners and government employees who haven't been paid for months, but it will reduce the purchasing power of the Ruble so that future pension payments will be worth less. This is not the way to restore confidence in the Russian economy.

There are several mechanisms to explain this, all leading to essentially the same conclusion:

        #1 The increase in the money supply pushes the aggregate demand curve to the right, generating inflation as the economy slides up the aggregate supply curve.

        #2 The increase in the nominal money supply will push the LM curve to the right, which will lower interest rates and stimulate investment and GDP via the IS curve (that explains the rightward shift in the aggregate demand curve). But if the economy is already operating at capacity (given its inefficiencies), prices will be pushed up, which will tend to reduce the real value of the money supply back to its initial level. Equilibrium will be restored when the real money supply and hence the LM curve have returned to their initial position, which means that prices will increase by the same percentage as the nominal money supply.

        #3 This same outcome is predicted by the monetarists using the quantity theory (see Samuelson, pages 627-628).

The finals impressed me!!!!   ☺ It was clear from the exam that almost everyone worked hard and learned a great deal of economics during the semester. Grades on the final averaged 87, but one student earned 117 points!

Happy New Year!!!