14.02 PRINCIPLES OF MACROECONOMICS
Spring 2002- QUIZ TWO

SOLUTIONS

PART I: TRUE OR FALSE? *(3 points per question, 24 points total)*
Answer True/False and explain briefly why true or false. (2 points for correct T or F answer plus 1 added point for reasonable, brief, one sentence explanation of why True or False, or for a directional ("greater" or "lower") correction if a magnitude is discussed)

1. Through a typical business cycle, we expect that each 1% increase in GDP will be associated with a 1% change in business investment

Answer: **False-** Investment is much more volatile than GDP.

2. In the long run, a fiscal expansion has no effect on investment.

Answer: **False-** The long- run equilibrium will be with GDP= GDP_{FE} and higher interest rate; this typically is associated with lower investment. A fiscal expansion will shift IS to right, put the new equilibrium with GDP>GDP_{FE} will lead to a higher inflation that causes LM to start moving to the left.

3. Current income has no impact on consumption decisions.

Answer: **False-** Consumption is an increasing function of current income, due to borrowing constraints, uncertainty, risk-aversion (re: borrowing), bounded rationality, time-varying preferences, etc.

4. Consumption must remain unchanged if current income and future expected labor income are unchanged.

Answer: **False-** E.g.., expectations about future wealth, longevity, health, matter.

5. Okun's law states that if the growth rate of potential GDP exceeds actual GDP growth by one percent for a year, then the unemployment rate goes down by 0.5%.

Answer: False, Unemployment rate goes up!.

6. A primary mechanism behind the price inflation – unemployment tradeoff is that when unemployment goes down, workers demand higher wages, which increases the cost of production of firms, and leads to higher prices.

Answer: True. This is the logic behind the aggregate supply equation.

7. In spite of possible J-curve phenomena, a real depreciation always causes real exports of the depreciating country to decrease.

Answer: False, real exports increase.

8. If the interest parity condition holds between countries A and B, as well as between countries B and C, then it also holds between countries A and C.

Answer: True. The rates of return of countries A and B bonds are the same measured in A currency (IPC between A and B). The rates of return of country B and C bonds are the same measured in B's currency, so by arbitrage, they are also the same measured in country A's currency. So that implies that the rates of return of country A and C bonds are the same measured in A's currency. So IPC also holds between A and C.

PART II: MULTIPLE CHOICE (4 points per question, 28 points total)
Clearly indicate the letter of your answer, and explain your choice in a few sentences.

1. If the central bank sells bonds to shrink the money supply and the government decreases spending then (in the short run):

    A. Investment will increase while the production may rise or fall

    B. Production will decrease, and investment may rise or fall

    C. Investment and production will definitely increase.

    D. Investment and production will definitely decrease.

    E. None of the above

Answer: (B) The mix of contraction monetary and fiscal policy shifts both IS and LM to the left leading to lower GDP. The interest rate might increase or decrease, therefore, investment might increase or decrease.

2. If the equilibrium output indicated by IS-LM is above the level consistent with NAIRU, all of the following are true, **<u>except</u>** (Be sure to think through the differences between movements along curves and movements of curves):

    A. This is not a sustainable IS-LM solution

    B. Inflation will rise, shifting the prior LM to the left

    C. The LM will shift to the left, thereby implying that AD is also shifting to the left

    D. Unemployment is below the NAIRU, so wages are rising

Answer: (C). It is a movement along the AD. The AD does not shift.

3. Which of the following is NOT a primary, direct determinant of aggregate consumption?

    A. Taxes

    B. Imports

    C. Real interest rates

    D. Demographics

    E. Expectations

Answer: (B) Part of consumption is through imports but imports do not determine consumption.

4. Samantha makes $30,000 per year and can invest wealth at 5% (real) per year. She believes that she will receive a one-time bonus of $15,000 next year, but expects that this bonus will have no affect on her future labor income. Assume that Samantha would like to consume the same amount each year for the rest of her life, which she expects to last 50 years. The permanent income theory of consumption implies that she should:

    A. Increase her consumption by $15,000 this year

    B. Temporarily increase her consumption by $15,000 this or next year

    C. Increase her yearly consumption by approximately $300 or slightly more, starting this year

    D. Increase her yearly consumption by approximately $300 or slightly less, starting next year

    E. Increase her saving by $15,000 next year

Answer: (C). She consumes the $300 plus some extra income because of the interest payments received on the investments.

5. Assume the one-year interest rate in the U.S. is 5% higher than the interest rate in Japan. This implies that

    A. The market expects the dollar to depreciate by 5% in the next year

    B. The market expects the dollar to appreciate by 5% in the next year

    C. Unemployment in Japan is higher than in the U.S.

    D. Unemployment in Japan is lower than in the U.S.

Answer: (A) Just by the IPC

6. Potential output growth is influenced by

    A. The tax rate payable on wages and profits

    B. Level of education

    C. Demographic structure (age-sex mix) of the population

    D. A and B

    E. A, B and C

Answer: (E) All of them affect growth. Lower taxes increase investment. Higher education makes people more productive. Younger population is also more productive.

7. The interest parity condition might not hold when:

    A. There is differential risk associated with one country

    B. Foreign exchange traders are irrational

    C. Inflation rates differ between the two countries.

    D. A and B.

Answer: (D). These are two of the cases where the assumptions behind IPC do not hold.

PART III: Analytical Problems (18 Points)

1) Optimal Investment and Capital (8):

- If the price of output is P, the cost of renting a unit of capital is R, and a firm's production function is $Y=AK^B L^{(1-B)}$. Solve for the optimal level of capital:essing
  A. What is the optimizing condition stated in words? (4 points)

  The marginal productivity of capital has to equal its relative price.

  B. What is the algebraic formula derived from this expressing K as a function of the other parameters above? (4 points)

$R/P=dY/dK=BA(K/L)^{(B-1)}$

Solve for $K=L (R/(ABP))^{(1/(B-1))}$

Or first replace B in the first equation with an expression involving Y:

$R/P= BA(K/L)^{(B-1)} \quad = BAY/(AK) = BY/K$

Solve for K: $K=BYP/R$

2) Policy and the Economy (10)

- An initial equilibrium with U=NAIRU is disturbed by a terrorist shock. Consumers and businesses curtail traveling, without boosting other purchases to compensate, thus throwing the economy toward recession.

- The Federal Reserve responds by boosting the money supply.

  A. What quickly happens to the IS curve, the LM curve, the inflation-unemployment curve? That is, which shift immediately and how? (**3 points**)

    IS shifts to the left, LM shifts right while the inflation-unemployment curve will no change

  B. If the Fed is successful in restoring U=NAIRU, what are the most likely directions of immediate change from the pre-shock equilibrium in real values of: (**7 points**)

    i. GDP: Unchanged

    ii. C:↓

    iii. I:↑

    iv. X:↑

    v. M: ambigous

    vi. Interest rates: ↓

    vii. The value of the dollar relative to the euro: ↓ (or E goes up)