

14.02 PRINCIPLES OF MACROECONOMICS
Spring 2002- Final Exam

STOP!! READ INSTRUCTIONS FIRST.

Read all questions carefully and completely before beginning the exam. There are **13** pages, and 3 sections of the quiz – make sure you do them all.

Show your work on all questions in order to receive partial credit. If your answer includes a graph, label all curves and axes clearly; if we can't read the graph, you will lose points on your answer.

The quiz is worth a total of **100** points, and is constructed so that each point corresponds to a minute of expected time. Therefore you can probably complete the exam in one hour forty minutes. Use the remainder of the examination period to check your work and thoughtfully reconsider answers. You will have 3 hours to complete the quiz.

There are no trick questions.

No notes, calculators, or books may be used during the quiz.

No blue books; use the blanket in this sheet.

Please, check your recitation:

- | | |
|-----------------------------------|---|
| <input type="checkbox"/> Samer 09 | <input type="checkbox"/> Tobias Adrian 11 |
| <input type="checkbox"/> Samer 10 | <input type="checkbox"/> Jonathan Zinman 13 |
| <input type="checkbox"/> Samer 11 | <input type="checkbox"/> Jonathan Zinman 14 |
| <input type="checkbox"/> Samer 12 | <input type="checkbox"/> Manuel Amador 15 |

| | | | | |
|------------|-----------|---------|-----------|-------|
| _____ | _____ | _____ | _____ | _____ |
| First Name | Last Name | MIT ID# | Signature | Date |

Good luck!

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. The US social security system has a future funding problem due to a rising dependency ratio.

Answer: _____

2. In the regression $C = a + bY$, the coefficient b captures the causal effect of current income on consumption, where C is consumption and Y is current income.

Answer: _____

3. The Fed should not pursue a rigid anti-inflationary monetary policy, since high inflation is simply a nominal or measurement phenomenon that does not impose any real costs on economic agents.

Answer: _____

4. Business equipment spending tends to be more volatile than GDP growth, and this is largely due to the inability of corporate management to plan capacity needs.

Answer: _____

5. In accounting for the capital stock, depreciation adjusts for the fact that interest rates fluctuate.

Answer: _____

6. As an economy converges toward high-income levels, its real exchange rate tends to appreciate.

Answer: _____

7. In all growth models, the only source of economic growth in the long run is capital accumulation.

Answer: _____

8. If a country is expected to devalue its currency in a year with respect to the US Dollar, the interest parity condition tells us that the one-year interest rate of this country has to be higher than the US interest rate.

Answer: _____

PART II: MULTIPLE CHOICE (4 points per question, 40 points total)
Clearly indicate the letter of your answer, and explain your choice in a few sentences.

1. Which type of the following technological innovations might directly, significantly affect the LM curve?
- A. ATM cards
 - B. More efficient ships
 - C. Faster computer chips
 - D. A and B are true.
 - E. A, and C. are true

Answer: _____

2. In the steady-state growth model, an increase in the savings rate of a country:
- A. Increases the steady-state rate of growth of the economy
 - B. Decreases the steady-state rate of growth of the economy
 - C. Increases the long-run level of output per worker
 - D. Reduces the long-run level of output per worker
 - E. A and C
 - F. B and D

Answer: _____

3. The Central Bank of Chile must hire a young economist to help with forecasting of Chilean economy. Suppose the wage of this assistant, like all other Chilean workers, is a function of various variables: $W = P^e F(u, Z)$. Let P^e represent expected prices, u represent the unemployment rate in Chile and let Z represent the maximum amount of time that one can receive unemployment benefits (for example, $Z=2$ signifies that when one becomes unemployed, he can receive benefits for at most 2 months). Which of the following is likely to be true:
- A. If the unemployment rate increases, we would expect the wage to increase.
 - B. Z should not affect the wage
 - C. If the maximum time is reduced to one month, the wage will decrease
 - D. Wages have no relation to unemployment as the modern Phillips curve shows
 - E. If Z increased then this will allow the wage offered to decrease

Answer: _____

4. Which of the following is an argument for switching Social Security from a “pay-as-you-go” system to one that is financed by actual savings?
- A. Increased capital accumulation
 - B. Increased steady-state output
 - C. Decreased vulnerability (in terms of program solvency) to demographic shifts
 - D. Transition costs can be spread across generations to some degree by government borrowing
 - E. All of the above are arguments for switching
 - F. A, B and D only

Answer: _____

5. Consider the following scenario: aggregate consumption is C_t during period t . At the beginning of period $t+1$, consumer confidence rises due to future expected real wealth increases. The life cycle theory of consumption implies that:
- A. $C_t > C_{t+1}$
 - B. $C_t < C_{t+1}$
 - C. $C_t = C_{t+1}$
 - D. Uncertain

Answer: _____

6. A central bank is trying to decide whether to switch from targeting price stability to targeting a stable inflation rate of 5%. Which of the following is a potential benefit of switching to a positive inflation rate?
- A. Money illusion can facilitate wage cuts when needed
 - B. Provides option for negative real interest rates
 - C. Reduces unemployment in the long-run
 - D. All the above.
 - E. A and B only.

Answer: _____

7. The long-run GDP impact of a shift in fiscal policy is dependent on its influence on capital spending because:
- A. NAIRU is dependent on investment
 - B. Productivity is dependent on investment
 - C. Exchange rates depend on investment choices
 - D. Money demand is dependent of saving decisions

Answer: _____

8. The reasons why Argentina defaulted on its debt and sank into a deep crisis were:
- A. An overvalued exchange rate
 - B. An excessive amount of foreign debt
 - C. Inability to control fiscal spending
 - D. All of the above

Answer: _____

9. If short term interest rates are expected to rise in the future then:

- A. Long-term interest rates today are greater than short-term interest rates today.
- B. Long-term interest rates today are smaller than short-term interest rates today.
- C. Long-term interest rates today are equal to short-term interest rates today.
- D. Uncertain.

Answer: _____

10. Okun's Law:

- A. Was passed by the congress in 1990s to address the fiscal deficit.
- B. States that there is a cyclical relation between unemployment and real growth.
- C. States that the change in the unemployment rate is twice the growth rate difference between potential and actual GDP growth.
- D. States that the level of unemployment is half the % gap between potential and actual GDP.
- E. Both B and D are true answers.

Answer: _____

PART III: Analytical Problems

(36 Points)

Choose any 3, and only 3, of the following four problems. If you work on all four and you are not clear which 3 are your choices, it will be assumed that 1,2, and 3 are your choice and 4 will not be graded.

Circle your three choices here: 1 2 3 4

1) Long Run Growth (12):

- If the national production function is $Y=AK^B L^{(1-B)}$, output prices are “p”, wages are “w” and the rental price of capital is “r”, solve for:

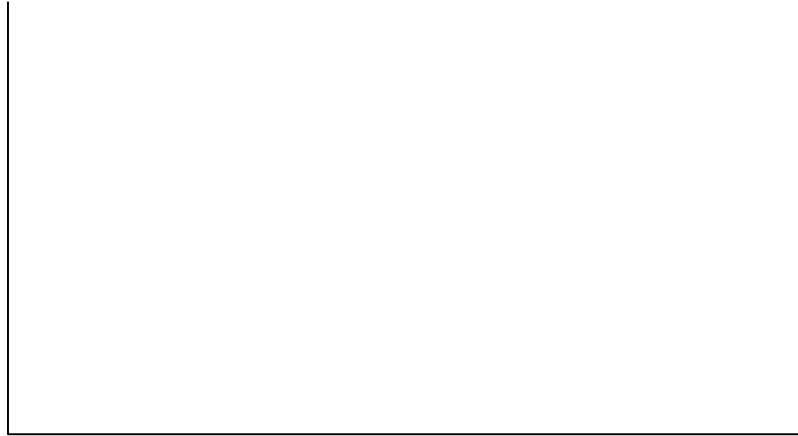
A. The optimal level of labor as a function of Y, w, p (3 points)

B. The equilibrium share of wage income in total income (1 points)

C. The increase in K necessary to double output without an increase in L. (2 points)

D. The steady state capital/labor ratio in this economy with no labor force or productivity growth depends on two key parameters. What are the two key parameters? (4 points)

- E. Present a graph of output per worker versus capital per worker displaying the steady state equilibrium values of both, and how they relate to the key parameters identified in D. Label all curves and axes clearly; if we can't read the graph, you will lose points on your answer. (2 points)



2) Policy and the Economy (12 points)

- An initial equilibrium with $U=NAIRU$ is disturbed by a massive permanent increase in defense spending purchases from domestic firms, partially paid for by an increase in personal taxes (that is, for every dollar that defense purchases are increased, personal taxes are increased on an ex ante basis (pre-feedback) by half as much).
- The Federal Reserve initially acts to keep interest rate unchanged at prior target level.

A. What has happened initially to the IS curve, the LM curve, the inflation-unemployment curve? That is, which have shifted in what directions and why? (6 points)

- The Federal Reserve later determines that it is failing to meet its long-term objectives and adjusts policy accordingly.

B. What are the primary objectives of the Federal Reserve (2 points)

C. When the economy settle into a new equilibrium, what are the most likely directions of change from the pre-shock equilibrium in real values of: (4 points)

i. C (Consumption):

ii. I (Investment):

iii. IM (Import):

iv. E (The value of the dollar relative to the euro):

3) Inflation Theory, Old and New (12 points)

- Assume that it has always been understood that price inflation (“RP”) equals wage inflation (“RW”) minus labor productivity growth (“RQL”): $RP = RW - RQL$
- Present a simple wage inflation equation, typical of the thinking behind the Phillips curves of the 1960s, explaining the key factors included **and** excluded (that is, erroneously omitted from consideration) in this model.

A. Equation (2 points): _____

B. Key factors included (1 points): _____

C. Key factors excluded (1 points): _____

- Present a more robust, modern model of wage inflation, explaining the key factor or factors now included.

D. Equation (2 points): _____

E. Key new factors included (1 points): _____

- Insert the new wage inflation equation into the price inflation equation, then move the appropriate terms to create the modern “accelerationist” model of price inflation and unemployment. In words, describe the fundamental implication for monetary and fiscal policy makers.

F. Equation (1 points): _____

G. Explanation (4 points): _____

4. The J-Curve in International Trade (12)

- The J-Curve effect differentiates between short-run and long-run effects. In the short run immediately after a depreciation, what are the typical changes to be expected in the depreciating country's trade conditions? Assume the absolute values of the long-run demand elasticities are greater than one for both imports and exports.
- Indicate the direction of the short-run change (Rise/Fall/No change) **and** the size of the short-run change relative to the long-run impact (Smaller/Larger/Same) (6 points). Circle the right answer in the table below:

| | | Direction of short-run change | Size of short-run change relative to the long-run impact |
|-------|---|--------------------------------------|---|
| (I) | Real exports: | Rise/Fall/No change | Smaller/Larger/Same |
| (II) | Nominal exports: | Rise/Fall/No change | Smaller/Larger/Same |
| (III) | The trade deficit denominated in the depreciating country's currency at actual prices: | Rise/Fall/No change | Smaller/Larger/Same (absolute value) |

- Indicate the direction of long-run change (Rise/Fall/No change) and the size of long-run change relative to the pre-depreciation status (Smaller/Larger/Same), assuming the absolute value of the long-run demand elasticities are 1.0. Circle the right answer in the table below:

| | | Direction of long-run change | Size of variable relative to the pre-depreciation status |
|------|------------------------------|-------------------------------------|---|
| (IV) | Real exports: | Rise/Fall/No change | Smaller/Larger/Same |
| (V) | Real imports: | Rise/Fall/No change | Smaller/Larger/Same |
| (VI) | Real equilibrium GDP: | Rise/Fall/No change | Smaller/Larger/Same |