

**Midterm Exam: 14.02
Spring 1999**

**Full Name:
TA Name:
Section Time:**

***STOP! Failure to follow these instructions
could be detrimental to your grade.***

Please answer all of the following questions completely. You have 90 minutes to complete the exam, which should be more than enough time. Please use three blue books for the exam, one for each set of questions. Be sure to LEGIBLY write your full name, section (which should consist of your TA's name and section time), and question number on the front of each blue book. When finished with the exam, you must return all three blue books and this signed exam sheet to a proctor. There are four sections, worth different numbers of points, for a total of 60 points.

BLUE BOOK #1

True False Uncertain (If you choose uncertain, explain why.)

Each question is worth 1 point. Estimated time for this section: 10 minutes.

1. An exogenous variable in a macro model is dependent on the values of other variables in the model.
2. All unemployment is involuntary.
3. For any given level of expected price inflation, there is a reliable linkage in the US economy between the rate of increase in wages and the rate of unemployment.
4. All types of government spending—purchases of planes, construction of schools, or social security benefit payments, for example—should have the same short-run impact on national employment and output growth.
5. If the central bank keeps interest rates unchanged, an increase of G (government purchases) shifts the IS curve to the right by roughly the value of G .
6. Productivity growth in the US, and most major industrial nations, has been more rapid in the past 20 years than in the prior twenty years.
7. In Landlockia, the central bank decides to sell bonds to the public, the government reacts at the same time increasing its spending to keep employment constant. As a consequence of these policies the interest rate in Landlockia falls.
8. A decrease in government expenditures is always good for investment (assume taxes remain constant).
9. If a country exports goods but does not import any then GDP has to be at least as large as exports.
10. As workers wage demands become less sensitive to the unemployment rate the cost of disinflation decreases.

Multiple Choice (Select all correct choices.)

Each question is worth 2 points. Estimated time for this section: 10 minutes.

1. During the past thirty years, US population growth has averaged what percent per year?
 - A. 0.5%
 - B. 1.2%
 - C. 2.0%
 - D. 3.3%
 - E. 4.1%
2. During the past thirty years, US real GDP growth has averaged what percent per year?
 - A. 0.5%

- B. 1.2%
 - C. 2.0%
 - D. 3.3%
 - E. 4.1%
3. When considering the “capital” factors supporting long-run GDP growth, which do economists appropriately count?
- A. Factory equipment
 - B. Pollution abatement devices
 - C. Research knowledge
 - D. The value of homes and factories
 - E. The value of public highways and bridges
 - F. The value of citizens’ stock and bond portfolios
4. Assume that the goal of the Government and the Central Bank is to keep employment constant while reducing the interest rate in the economy. The following policy mix achieves this goal:
- A. Government increases its spending (while keeping taxes constant). Central Bank sells bonds in an open market operation.
 - B. Government increases its spending (while keeping taxes constant). Central Bank buys bonds in an open market operation.
 - C. Government reduces its spending (while keeping taxes constant). Central Bank sells bonds in an open market operation.
 - D. Government reduces its spending (while keeping taxes constant). Central Bank buys bonds in an open market operation.
5. What is the impact of an increase in transactions on equilibrium values in money and bond markets?
- a. The demand for money increases.
 - b. The demand for bonds decreases.
 - c. The demand for bonds increases.
 - d. The equilibrium interest rate increases.
 - e. The equilibrium interest rate decreases.

BLUE BOOK #2

Brief explanations

Each question is worth 5 points. Estimated time for this section: 20 minutes.

1. An econometrician has estimated a demand equation for consumer durable spending:
Real Consumer Durable Spending (\$) = -405 + .203 x Real After-tax Household Income
Mean values: Durables, 500 ; Income, 4000
 What is the estimated average propensity to consume durables
 What is the estimated marginal propensity to consume durables?
 What is the elasticity of durable spending at the mean values with respect to income?
2. Another econometrician has estimated a different demand equation with the same data:
 $\log(\text{Real Consumer Durable Spending } (\$)) = 100.5 + 1.8 \times \log(\text{Real After-tax Household Income})$
Mean values: Durables, 500 ; Income, 4000
 What is the estimated marginal propensity to consume durables?
 What is the elasticity of durable spending with respect to income?
3. Explain why the price of a previously purchased 2-year zero-coupon bond drops when market rates of interest rise. A 2-year zero-coupon bond pays you \$1000 two years from now and nothing until then. Compare this with a 3-year zero-coupon bond (which pays you \$1000 three years from now and nothing until then). Which price will fall more? Explain your answer.

4. Briefly summarize the different motivations to hold money; explain why each may or may not be sensitive to the level of income or interest rates; show why the LM curve has the slope and shape indicated by theory (and your prior explanations.)

BLUE BOOK #3

Macro Model building exercise:

Section is worth 20 points. Estimated time for this section: 20 minutes.

Build a basic model of an economy from the following description:

1. Consumers

- Pay a flat 1/3 of their gross wages, interest and dividends in taxes.
- Buy consumer goods equal to 5/6 of their after-tax wage and dividend income.
- Imports are 20% of their consumer goods purchases.

Suggested Var

W, Div, YD, Tin
C, S
MC

2. Businesses

- For each \$100 dollars of revenue (GDP) they receive, they have costs and profits of:
 - \$70 wages
 - \$10 depreciation
 - \$10 interest paid to households
 - \$10 profit, all of which is paid out as dividends; no corporate taxes.
- They buy new plant and equipment equal to depreciation cost plus profits each year.
- 50% of the new plant and equipment purchased is imported.

GDP
W
Dep
Int
Profit
I
MI

3. Government

- The Government buys \$150 in defense goods plus \$150 of other goods.
- No taxes other than income taxes are collected. (Other taxes = Tother = 0)

G
T

4. Foreign Buyers

- Overseas purchases of this nation's goods equal \$200 per year.

X

This is a small economy that must pay the going global interest rate; this economy has no impact.

- A. Write out the set of behavioral equations describing each income and spending component of this economy.
 - Reduce the equations by substitution into one another.
 - Write the derived "multiplier" equation of the form: $GDP = \text{coefficient (i.e. multiplier)} \times (G + X)$
- B. Solve the equations to produce the initial equilibrium GDP, C, I, G, X, M, and government deficit.
- C. Assume a new President Raygun adds \$75 to defense spending.
 - Re-solve the equations to produce the new equilibrium GDP, C, I, G, X, M.
- D. Next, also assume Congress raises other tax revenue ("Tother") by \$75 to attempt to rebalance the budget.
 - Adjust and re-solve the equations to produce the new equilibrium GDP, C, I, G, X, M.
 - Write the new derived "multiplier" equation of the form: $GDP = \text{coefficient 1} \times (G + X) - \text{coefficient 2} \times \text{Tother}$.
- E. What is the value of the "balanced budget" multiplier of equal, simultaneous increases in G, T?
- F. Why, conceptually, is the G multiplier bigger (in absolute terms) than the T multiplier?