ECO202: PRINCIPLES OF MACROECONOMICS
FIRST MIDTERM EXAM
SPRING 2001
Prof. Bill Even

Directions

1. There are two parts to the exam. The first part consists of multiple choice and short answer questions. The first 30 questions are worth 3 points each. Answers for these questions should be placed on the answer sheet attached at the end of the exam. The second part of the exam asks you to answer 3 of 4 short essay problems worth a total of 18 points.

2. No credit will be given for answers that are misplaced.

3. You may use a calculator.

4. You have until the end of the period to finish the exam. No extra time will be allowed.

5. Academic dishonesty is a serious offense. In the event I find someone behaving in a dishonest manner, I will ask that the maximum penalty allowed by the university be imposed.
To answer the next 3 questions, consider the following information taken from the *1999 Statistical Abstract of the United States*. Between 1960 and 2000, private investment spending rose from 89.1 billion to 1755.7 billion in nominal dollars. In 1996 dollars, real private investment spending rose from $305.3 billion to $1773.6 billion. The GDP-deflator was used to convert nominal into real values.

Give all growth rates to the nearest one-tenth of one percent -- e.g. 8.2%.

1. What was the average annual rate of growth in real private investment spending between 1960 and 2000?

2. What was the GDP-deflator in 1960?

3. Using the GDP-deflator as your measure of the price level, $1 in 1960 bought as much as $_______ in 2000 (round your answer to the nearest dollar.)

4. Using the GDP-deflator as your measure of the price level, the average annual rate of inflation between 1960 and 2000 was _______ (round your answer to the nearest one-tenth of one percent).

Use the following information to answer the next two questions. Between 1990 and 2000, the consumer price index (base year 1983) rose from 127.6 to 169.2. Over the same period, the average hourly wage rate rose from $9.83 to $13.49.

5. The real wage rate in 2000 was __________ (give your answer in dollars and cents).

6. A person earning $9.83 in 1990 would have to earn $_______ in 2000 if they were to have the same purchasing power.
For the next 3 questions, **round your answers to the nearest dollar.**

7. If you deposit $1000 in a savings account for 15 years at 8% interest, what will your account balance be at the end of the 15 years?

8. If you want a $20000 balance in your savings account 10 years from today, how much must you deposit in the bank today if the nominal interest rate is 6%?

9. If you promised to pay the bank $500 per year for 2 years with the first payment to be made two years from today, what is the most the bank would lend you if it charges you a 8% interest rate on the loan?

To answer the next 4 questions, suppose that your life is split into two periods -- this year and next year. You earn $40,000 this year and $30,000 next year. Income is received at the beginning of each year. **Round all of your answers to the nearest dollar and assume a 5% interest rate.**

10. What is your wealth today?

11. Assuming that you can borrow or lend at 5% interest, how much can you consume this year if you want to have $35,000 to spend next year?

12. If you wish to “smooth out” consumption (i.e. have the same level of consumption in each period), how much can you consume in each period?

13. If you want to increase spending by $500 next year, how much will you have to increase saving this year?
14. The wealth effect of higher interest rates will:
   a. increase consumption by everyone.
   b. increase consumption by savers only.
   c. increase consumption by borrowers only.
   d. decrease consumption by everyone.

15. The substitution effect of higher interest rates will:
   a. increase consumption by everyone.
   b. increase consumption by savers only.
   c. increase consumption by borrowers only.
   d. decrease consumption by everyone.

16. According to the "consumption smoothing" model, an increase in this year's income that is not expected to continue in future years will cause:
   a. current consumption and current saving to rise.
   b. current consumption to rise but current saving to fall.
   c. current saving to rise but leave current consumption unaffected.
   d. current consumption to rise but leave current saving unaffected.

17. According to the consumption smoothing model, a decrease in expected future income will cause
   a. this period’s consumption to fall and this period’s saving to rise.
   b. this period’s consumption and saving to rise.
   c. this period’s consumption to rise and this period’s savings to fall.
   d. this period’s consumption and savings to fall.

18. Consider the following investment opportunity. You can purchase a machine today for $100,000. You can rent this machine to a customer for $40,000 per year for each of the next 3 years. At the end of the 3 years, you can scrap the machine and sell it for $10,000. Your first payment will come at the end of the first year. What is the NPV of this investment if the interest rate is 10%? (round your answer to the nearest dollar).

19. Suppose that the NPV of a project is negative at an interest rate of 8%. Based on this information, we can concluded that:
   a. the internal rate of return on the project is above 8%.
   b. the internal rate of return on the project is below 8%.
   c. if the project was financed with a loan at a 8% interest rate, the net income from the project would be inadequate to cover the loan payments.
   d. b and c.
   e. a and c.
20. Based on behavior predicted by the loan market, if people suddenly begin to believe that their future income will be lower than they previously thought, we would expect.
   a. an increase in interest rates because people would begin saving more and borrowing less.
   b. a decrease in interest rates because people would begin saving more and borrowing less.
   c. an increase in interest rates because people would begin saving less and borrowing more.
   d. a decrease in interest rates because people would begin saving less and borrowing more.

21. A technological innovation that spurs new investment in equipment would:
   a. reduce loan demand and decrease interest rates.
   b. reduce loan supply and increase interest rates.
   c. increase loan demand and increase interest rates.
   d. increase loan supply and decrease interest rates.

22. A decrease in the expected rate of inflation will lead to:
   a. a decrease in nominal interest rates.
   b. an increase in nominal interest rates.
   c. a decrease in real interest rates.
   d. an increase in real interest rates.

23. According to the equation of exchange, if velocity is unchanged over time, 5 percent inflation could be caused by:
   a. 0% growth in the money supply and 5% growth in real GDP.
   b. 10% growth in the money supply and 5% growth in real GDP.
   c. 3% growth in the money supply and 8% growth in nominal GDP.
   d. 5% growth in the money supply and 0% growth in nominal GDP.
24. If inflation over the next year is higher than expected when loans were negotiated:
   a. borrowers and lenders will win.
   b. borrowers will lose and lenders will win.
   c. borrowers will win and lenders will lose.
   d. borrowers and lenders will lose.

25. According to the rule of 72, if real GDP grows at 6% per year, real GDP will quadruple in approximately _____ years.

To answer the next 2 questions, consider the following description of the federal income tax system. The marginal tax rate on income for a single taxpayer is described in the table below:

<table>
<thead>
<tr>
<th>Taxable Income</th>
<th>0 to 23,350</th>
<th>23,350 to 61,400</th>
<th>61,400 to 128,100</th>
<th>128,100 to 274,450</th>
<th>278,450 and above</th>
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<td>Marginal tax rate</td>
<td>15%</td>
<td>28%</td>
<td>31%</td>
<td>36%</td>
<td>39.6%</td>
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26. If a person’s taxable income is $50,000, how much does she owe in taxes? (round your answer to the nearest dollar).

27. If a person’s taxable income is $50,000, what is her average tax rate? (give your answer to the nearest one-tenth of one percent -- e.g. 11.3%).

28. Suppose the income tax system is NOT indexed. If there is inflation of 10% and everyone’s nominal income rises by 10%:
   a. average tax rates will rise.
   b. nominal tax payments will rise exactly 10%.
   c. real tax payments will be unchanged.
   d. all of the above.

29. Suppose the income tax system is indexed. If there is inflation of 10% and the person described above realizes an increase in income from $50,000 to $55,000 (a 10% increase), her new tax bill will be $______________ (round your answer to the nearest dollar).
30. Suppose you can buy an indexed bond with a 3% coupon rate or a non-indexed bond with a 6% interest rate. Both bonds can be purchased for $1000 and would have a maturity value of $1000. The maturity value is indexed in the case of the indexed bond, however. You should prefer the indexed bond over the non-indexed if and only if:
   a. you expect inflation to exceed 4 percent per year.
   b. you expect inflation to exceed 2 percent per year.
   c. you expect inflation of less than 2 percent per year.
   d. you expect inflation of less than 4 percent per year.
1. (6 points) Over the past 15 years, increasing numbers of married women are employed outside of the home and paying others to supervise their children. As a result, revenues in day care centers rose from $2.6 billion to $12.8 billion between 1985 and 1997. Over the same period, the CPI rose from 105.7 to 154.1.

a. Can inflation explain the growth in day care spending? Explain the basis for your answer. Given the information provided, nominal spending on day care rose by 392% whereas prices rose by 46%. Hence, the growth in day care spending cannot be attributed to inflation alone. (An alternative way of explaining this is that in real terms day care spending rose from $2.46 billion to $8.31 billion. Real values are computed by deflating the nominal values by the CPI).

b. Assuming that the growth in day care cannot be accounted for by inflation, will this cause the growth in per-capita GDP to be an over- or understatement of how much the standard of living has improved over the period? Why?

With the growth of day care services, we have begun paying for things that we used to provide for ourselves. When we provided our own day care, it did not count in GDP. When we pay for day care, it is counted in GDP. Consequently, the growth in GDP will over-state the true growth in the standard living.

2. Quoting from a recent article posted on the Dismal Scientist, "The saving rate as measured by NIPA (national income and product account) has been declining since 1993, dropping from a peak of 8.9% in mid-1992 to a negative 0.8% by the end of last year."

a. Define investment.

Investment is the purchase of capital goods such as plant, equipment, or new housing.

b. Draw a loan supply and loan demand curve. Label the axes and use it to explain how and why lower savings will affect investment.

With a decrease in saving, loan supply is reduced and shifts left as in the diagram above. This pushes up interest rates from \(r_0\) to \(r_1\). With higher interest rates, it becomes less likely that the internal rate of return on an investment exceeds the interest rate. Consequently, higher interest rates reduce the amount of investment.
3. (6 points)
a. In recent weeks, the Federal Reserve has adjusted interest rates. Which way were interest rates adjusted and what was the reason for the cut?

*The Fed cut interest rates in an attempt to stimulate spending in the economy. The reason for the cut is that there are numerous signs that spending is on the decline and the lower interest rates were intended to stimulate spending and reduce the chance of a recession.*

b. The Fed chairman recently revealed his opinion on the desirability of a tax cut. Was he in favor or against a tax cut? If he was in favor of the tax cut, how does he think it will "help" the economy? If he was against, how does he think it will "hurt"?

*The Fed chairman indicated that he was in favor of a tax cut because he thinks the economy is slowing down and a tax cut may provide a stimulus to spending and reduce the chance of a recession.*

4. (6 points)
a. Did the Conference Board's index of consumer confidence recently rise or fall?

*It fell.*

b. How and why would the change in consumer confidence affect the likelihood of a recession?

*If consumers become less confident in their job security or the potential for future wage growth, they are likely to cut back on spending. A reduction in spending could increase the likelihood of recession because when people stop buying, firms begin laying off workers in order to cut production to match the lower level of sales.*
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