厦门大学《经济学原理》课程试卷

经济学院与王亚南经济研究院 2016 年级本科国际化试点班

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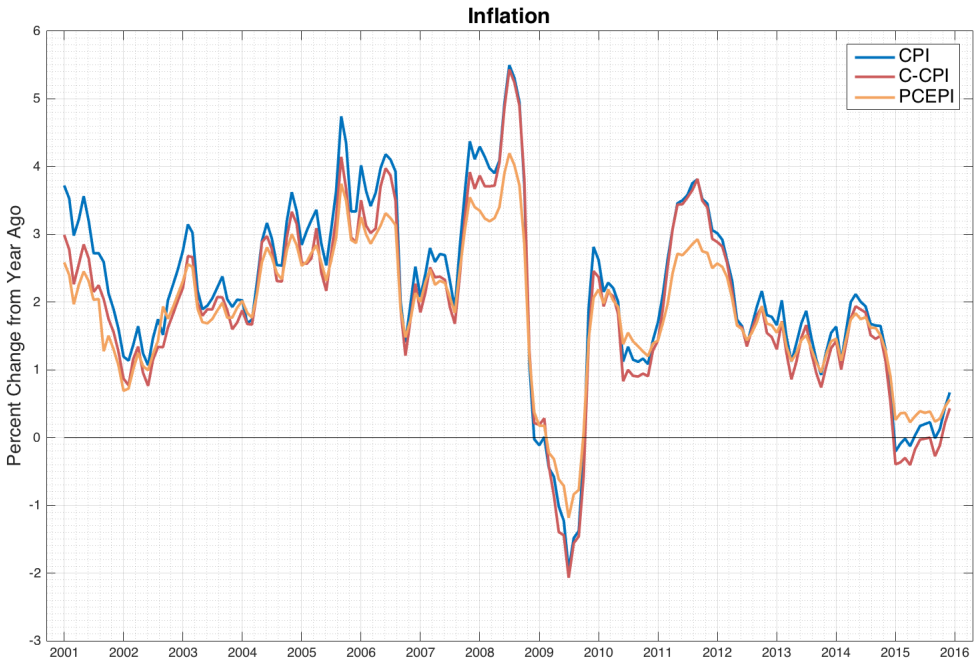
Principles of Economics

Final Examination



Part I
Multiple Choices (2 points each)

1. The tragedy of the commons is
   (a) a problem due to common resources being over-consumed
   (b) a problem due to negative externality
   (c) none of the above
   (d) **both a and b**

2. The Coase theorem does NOT apply if
   (a) there is a significant externality between two parties.
   (b) the court system vigorously enforces all contracts.
   (c) **transaction costs make negotiating difficult.**
   (d) both parties understand the externality fully.

3. A paper plant produces water pollution during the production process. If the government forces the plant to internalize the negative externality, then the
   (a) supply curve for paper would shift to the right.
   (b) **supply curve for paper would shift to the left.**
   (c) demand curve for paper would shift to the right.
   (d) demand curve for paper would shift to the left.

4. A benevolent social planner would prefer that the output of good x be decreased from its current level if, at the current level of output of good x,
   (a) **social value = private value = private cost < social cost.**
   (b) private cost < social cost = private value = social value.
   (c) social cost = private cost = private value < social value.
   (d) social cost = private cost = private value = social value.

5. Highway engineers want to improve a dangerous stretch of highway. They expect that it will reduce the risk of someone dying in an accident from 5.3 percent to 2.1 percent over the life of the highway. If a human life is worth $10 million, then the project is worth doing as long as its opportunity cost is no more than

   (a) $53,000.

   (b) $210,000.

   (c) **$320,000.**

   (d) $2.1 million.

6. Alexander lives in an apartment building and gets a $250 benefit from playing his stereo. Mary, who lives next door to Alexander and often loses sleep due to the loud music coming from Alexander's stereo, bears a $350 cost from the noise. Mary would like to offer Alexander some money to turn down the volume on his stereo. If Mary had to hire a lawyer to draw up the contract, what is the maximum amount she could pay to the lawyer to ensure that both Alexander and Mary would benefit from the agreement?

   (a) **an amount less than $100**

   (b) an amount between $100 and $250

   (c) an amount between $250 and $350

   (d) Any amount could result in both parties benefiting from the agreement.

7. On hot summer days, electricity-generating capacity is sometimes stretched to the limit. At these times, electric companies may ask people to voluntarily cut back on their use of electricity. An economist would suggest that

   (a) every electric customer has an incentive to prevent the system from overloading, so this voluntary approach is the most efficient.

   (b) **it would be more efficient if the electric company raised its rates for electricity at peak times.**

   (c) it would be more efficient to have a lottery to decide who had to cut back their use of electricity at peak times.

   (d) it would be more efficient to force everyone to cut their usage of electricity by the same amount.

8. The city of Xiamen buys a police car manufactured in Germany. In the GDP accounts this transaction is included in

   (a) government expenditures and exports.

   (b) **government expenditures and imports.**

   (c) exports, but not government expenditures.

   (d) imports, but not government expenditures.

9. An American company operates a fast food restaurant in Paris, France. Which of the following statements is accurate?

   (a) The value of the goods and services produced by the restaurant is included in both French GDP and U.S. GDP.

   (b) The value added by American workers and equipment in France is included in U.S. GDP and the value added by French workers and equipment is added to French GDP.

   (c) **The value of the goods and services produced by the restaurant is included in French GDP, but not in U.S. GDP.**

   (d) The value of the goods and services produced by the restaurant is included in U.S. GDP, but not in French GDP.

10. AA Appliances sells refrigerators. In 2015 it added $100,000 to its inventory. $10,000 of this addition was from used refrigerators, and the remaining $90,000 was from their purchases of newly manufactured refrigerators. How much of AA's inventory is included in 2015 GDP?

    (a) $0

    (b) $10,000

    (c) **$90,000**

    (d) $100,000

11. Consider two cars manufactured by Chevrolet in 2014. During 2014, Chevrolet sells one of the two cars to Emily for $20,000. Later in the same year, Emily sells the car to Jim for $18,000. The second automobile, with a market value of $19,000, is unsold at the end of 2014 and it remains in Chevrolet's inventory. The transactions just described contribute how much to GDP for 2014?

    (a) $20,000

    (b) $37,000

    (c) $38,000

    (d) **$39,000**

12. In 2014, a farmer grows and sells $3 million worth of corn to Big Flakes Cereal Company. Big Flakes Cereal Company produces $8 million worth of cereal in 2014, with sales to households during the year of $7 million. The unsold $1 million worth of cereal remains in Big Flake Cereal Company's inventory at the end of 2014. The transactions just described contribute how much to GDP for 2014?

    (a) $3 million
    (b) $7 million
    (c) **$8 million**
    (d) $11 million

13. A worker received $5 for a daily wage in 1930, which has the equivalent value of $63.24 today. If the CPI was 17 in 1930 what is the value of the CPI today, rounded to the nearest whole number?

    (a) **215**
    (b) 134
    (c) 17
    (d) 1.3

14. Suppose the price of a gallon of ice cream rises from $4 to $5 and the price of a can of coffee rises from $2 to $2.50. If the CPI rises from 150 to 177, then people likely will buy

    (a) more ice cream and more coffee.
    (b) more ice cream and less coffee.
    (c) less ice cream and more coffee.
    (d) **less ice cream and less coffee.**

15. A nation's standard of living is best measured by its

    (a) real GDP.
    (b) **real GDP per person.**
    (c) nominal GDP.
    (d) nominal GDP per person.

16. Which of the following best illustrates the human capital of a survivor stranded on an island?

    (a) the fishing poles she has produced

    (b) the invention of a better fishing lure

    (c) the fresh fruit and fish on and around the island

    (d) **her previous training in a survival course**

17. Which of the following best states economists' understanding of the facts concerning the relationship between natural resources and economic growth?

    (a) A country with no or few domestic natural resources is destined to be poor.

    (b) Differences in natural resources have virtually no role in explaining differences in standards of living.

    (c) Some countries can be rich mostly because of their natural resources and countries without natural resources need not be poor, but can never have very high standards of living.

    (d) **Abundant domestic natural resources may help make a country rich, but even countries with few natural resources can have high standards of living.**

18. Which of the following would not be a result of replacing the income tax with a consumption tax so that interest income was no longer taxed?

    (a) The interest rate would decrease.

    (b) **Investment would decrease.**

    (c) The standard of living would eventually rise.

    (d) The supply of loanable funds would shift right.

19. The president of a poor country has announced that he will implement the following measures which he claims are designed to increase growth: 1. Reduce corruption in the legal system; 2. Reduce reliance on market forces because they allocate goods and services in an unfair manner; 3. Restrict investment in domestic industries by foreigners because they take some of the profits out of the country; 4. Encourage trade with neighboring countries; and 5. Increase the fraction of GDP devoted to consumption. How many of these measures will have a positive effect on long run economic growth?

    (a) 1

    (b) **2**

    (c) 3

    (d) 4

20. You observe a closed economy that has a government deficit and positive investment. Which of the following is correct?

    (a) Private and public saving are both positive.

    (b) **Private saving is positive; public saving is negative.**

    (c) Private saving is negative; public saving is positive.

    (d) Both private saving and public saving are negative.

Part II
Problems

Problem 1 (10 points)

In class we study the determinants of a country's productivity and some public policies that the government might adopt to promote productivity.

1. Use the data below on U.S. real GDP below to compute real GDP per person for each year. Then use these numbers to compute the percentage increase in real GDP per person from 1987 to 2005. (3 points)

Year	Real GDP (2000 prices)	Population
1987	$6,435,000 million	243 million
2005	$11,092,000 million	296.6 million

Real GDP per person in 1987 was $6,435,000/243= about $26,481. Income per person in 2005 was $11,092,000/296.6 = about $37,397. Income per person grew by (37,397 - 26,481)/26,481 = about 41.2 percent.

2. According to your textbook, what are the determinants of a country's productivity? (4 points)

physical capital, human capital, natural resources, and technological knowledge

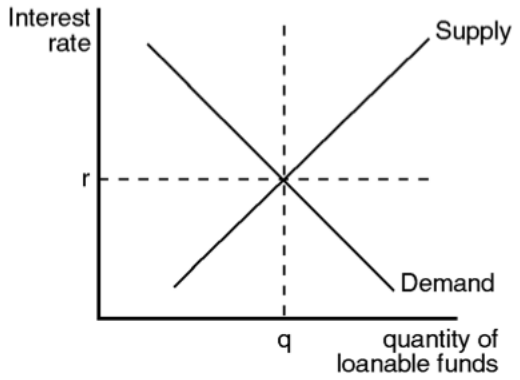
3. Some data that at first might seem puzzling: The share of GDP devoted to investment was similar for the United States and South Korea from 1960-1991. However, during these same years South Korea had a 6 percent growth rate of average annual income per person, while the United States had only a 2 percent growth rate. If the saving rates were the same, other things equal, why were the growth rates so different? (3 points)

The argument that poor countries will tend to catch up with rich ones is based on the idea of diminishing returns: additional unit of capital will increase output more in a country that has little capital than one that has much capital. So, other thing equal, for a given share of GDP devoted to investment, a poor country will grow faster than a rich one.

Problem 2 (10 points)

In class we use the demand and supply framework to analyze the market for loanable funds. The equilibrium interest rate of that market is the long-run real interest rate. Assume that we are investigating a *closed* economy. (10 points)

1. Draw and label a graph showing equilibrium in the market for loanable funds. In addition, state explicitly how the textbook define the demand side and supply side. (4 points)



Demand: private borrowers; Supply: National saving, or Y-C-G

2. Explain why the demand for loanable funds slopes downward and why the supply of loanable funds slopes upward. (2 points)

When the interest rate rises investment spending becomes more expensive, so people invest less. As the interest rate rises saving becomes more rewarding, so people want to save more. The inverse relation between interest and borrowing is reflected in the downward slope of the demand for loanable funds curve. The positive relation between interest and saving is reflected in the upward slope of the supply of loanable funds curve.

3. Consider an investment tax credit that gives a tax advantage to any firm building a new factory or buying a new piece of equipment. Specifically, it directly reduces the tax bills of those firms. What is the effect of an investment tax credit on the equilibrium interest rate and investment? (2 points)

   `Supply fixed; Demand shift to the right; In equilibrium we have a higher interest rate and a higher investment.`

4. Let T denote the amount of tax and G denote government spending. Assume we begin with a balanced budget where T=G. But suddenly G increases while T remains the same, so we run into a budget deficit. Assuming private saving and Investment demand also remain the same. What is the impact of this increase in G on the equilibrium interest rate and investment? (2 points)

   `Supply shift to the left, demand fixed; in equilibrium a higher interest rate and lower investment.`

Problem 3 (10 Points)

The table below contains data for country A for the year 2010.

Household purchases of durable goods	$1293
Household purchases of nondurable goods	$1717
Household purchases of services	$301
Household purchases of new housing	$704
Purchases of capital equipment	$310
Inventory changes	$374
Purchases of new structures	$611
Depreciation	$117
Salaries of government workers	$1422
Government expenditures on public works	$553
Transfer payments	$777
Foreign purchases of domestically produced goods	$88
Domestic purchases of foreign goods	$120

1. What was country A's GDP in 2010?
   `$7253`

2. What was country A's consumption in 2010?
   `$3311`

3. What was country A's investment in 2010?
   `$1999`

4. What were country A's government purchases in 2010?
   `$1975`

5. What were country A's net exports in 2010?
   `-$32`

Problem 4 (10 Points)

Consider the following economy that produces 1 good (TV) and one service (haircut).

	Haircut		TV	
Year	price	quantity	price	quantity
2000	20	100	1000	20
2010	35	200	500	10

1. Calculate the nominal GDP for 2000 and 2010.
   `22000, 12000`

2. Let 2000 be the base year. Calculate the CPI[1] for 2000 and 2010.
   `100, 61.36`

3. Let 2010 be the base year. Calculate the fixed-weight real GDP for 2000 and 2010.
   `13500, 12000`

4. Calculate the *annual* GDP growth rate between 2000 and 2010.

   `If 2000 is used as the base year, then real GDP 22000,14000. Hence the annual GDP growth rate =` $\left(\frac{14000}{22000}\right)^{\frac{1}{10}} - 1 = -4.42\%$

   `If 2010 is used as the base year, annual GDP growth rate =` $\left(\frac{12000}{13500}\right)^{\frac{1}{10}} - 1 = -1.17\%$

5. Calculate the *annual* inflation rate[2] between 2000 and 2010.

   `If 2000 is used as the base year, the annual inflation rate =` $\left(\frac{61.36}{100}\right)^{\frac{1}{10}} - 1 = -4.77\%$

   `If 2010 is used as the base year, then CPI = 116.67,100. Hence the annual inflation rate =` $\left(\frac{100}{116.67}\right)^{\frac{1}{10}} - 1 = -1.53\%$

[1] as a Laspeyres index.
[2] based on the CPI

Problem 5 (6 points)

There are three groups in a community. Their demand curves for public television in hours of programming, T, are given respectively by

$$W_1 = \$200 - T$$
$$W_2 = \$240 - T$$
$$W_3 = \$320 - 2T$$

, where W_i denotes i's willingness to pay (WTP).

Suppose public television is a public good that can be good that can be produced at a cost of \$200 per hour.

1. What is the efficient number of hours of public television? (3 points)

   `Total demand for public TV:`

   $$W = 760 - 4T$$

   `Social optimum:`

   $$760 - 4T = 200 \Rightarrow T^* = 140$$

2. If the government charges each group for watching public TV at a price of \$200/hour, then it becomes excludable. In such a case, how many hours of programming would the three groups consume, respectively (3 points)

   $T_1 = 0, T_2 = 40, T_3 = 60$.

Problem 6 (14 points)

The Georges Bank, a highly productive fishing area off New England, can be divided into two zones in terms of fish population. Zone 1 has more fish per square mile but is subject to severe diminishing returns to fishing effort. The total daily fish catch (in tons) in Zone 1 is

$$F_1 = 200X_1 - 2\left(X_1\right)^2 \tag{1}$$

, where X_1 is the number of boats fishing there. Each boat then equally share the total daily fish catch.

Zone 2 has fewer fish per square mile but is larger, and diminishing returns are less of a problem. Its daily fish catch is

$$F_2 = 100X_2 - \left(X_2\right)^2 \tag{2}$$

, where X_2 is the number of boats fishing in Zone 2. Each boat then equally share the total daily fish catch.

There are 100 boats now licensed by the U.S. government to fish in these two zones. The fish are sold at \$100 per ton. Total cost (capital and operating) per boat is constant at \$1,000 per day. Answer the following questions about this situation:

1. If the boats are allowed to fish where they want, with no government restriction, how many will fish in each zone (note: the number of fish need NOT be an integer)? What will be the gross value of the catch? What will be the total profit (the gross value of the catch minus the total cost for all boats)? (5 points)

   People will fish until the catch in each zone is the same:

   $$\frac{F_1}{X_1} = \frac{F_2}{X_2} \Rightarrow 200 - 2X_1 = 100 - X_2 \Rightarrow X_1 = \frac{200}{3}, X_2 = \frac{100}{3}$$

   , where $X_1 + X_2 = 100$.

   Total catch:

   $$F_1 + F_2 = 200 \times \frac{200}{3} - 2 \times \left(\frac{200}{3}\right)^2 + 100 \times \frac{100}{3} - \left(\frac{100}{3}\right)^2 = 6666$$

   Total revenue: \$666,600

   Total profit:\$666,600 - \$1000×100 = \$566,600

2. If the government can restrict the boats, how many should be allocated to each zone? What will be the gross value of the catch? What will be the total profit? Assume the total number of boats remains at 100. (5 points)

   The government maximizes total profit: $100 \times (F_1 + F_2) - 1000 \times 100$, which is equivalent to maximizing the total catch:

$$\begin{aligned} F_1 + F_2 &= 200X_1 - 2(X_1)^2 + 100X_2 - (X_2)^2 \\ &= 200X_1 - 2(X_1)^2 + 100 \times (100 - X_1) - (100 - X_1)^2 \end{aligned} \tag{3}$$

   Maximizing (3) w.r.t. $X_1 \Rightarrow X_1^* = 50, X_2^* = 50$

   Total catch: $F_1 + F_2 = 7500$

   Total revenue: \$750,000

   Total profit: \$650,000[3]

3. Assuming there is no limit on the number of licensed boats, for a government wishing to maximize the profit of the catch, how many boats should fish in each zone? (2 points)

   Profit in Zone 1:

$$\pi_1 = 100 \times \left(200X_1 - 2(X_1)^2\right) - 1000X_1 \tag{4}$$

   Maximizing (4) w.r.t. $X_1 \Rightarrow X_1^* = 47.5$

   Profit in Zone 2:

$$\pi_2 = 100 \times \left(100X_2 - (X_2)^2\right) - 1000X_2 \tag{5}$$

   Maximizing (5) w.r.t. $X_2 \Rightarrow X_2^* = 45$

4. There are 100 boats now licensed. If additional fishermen want to buy boats and join the fishing fleet, should a government wishing to maximize the profit of the catch grant them licenses? Why or why not? (2 points)

   Because each additional boat above 92.5 decreases total profit, the government should not grant any more licenses.

[3] Notice that the profits are not evenly divided between boats in the two zones. The average catch in Zone 1 is 100 tons per boat, while the average catch in Zone 2 is 50 tons per boat. Therefore, fishing in Zone 1 yields a higher profit for the individual owner of the boat.