

Economics 132.03
Principles of Macroeconomics
Spring 2008

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<http://www2.bc.edu/~irelandp/ec132.html>

First Midterm Exam

This exam has 9 questions on 3 pages; before you begin, please check to make sure your copy has all 9 questions and all 3 pages. Each of the 9 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. What happens to US gross domestic product (GDP) and its four main components when ...
 - a. Hallmark (a US firm) buys \$1 million worth of paper from International Paper (another US firm) to make greeting cards?
 - b. You (a US resident) buy a used car?
 - c. The State of Massachusetts hires a new employee?
 - d. General Motors (a US firm) buys new computer equipment made in Japan?
 - e. You (a US resident) spend \$25 on a haircut?

2. Consider a simple economy in which only two goods are produced and sold: pizza and beer. The prices and quantities produced of these two goods over a three-year period are shown in the table below.

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2005	\$2	1	\$2	1
2006	\$2	3	\$2	2
2007	\$4	3	\$8	2

- a. Calculate nominal GDP in 2005, 2006, and 2007.
- b. Next, using 2005 as your base year, calculate real GDP in 2005, 2006, and 2007.
- c. Does the GDP deflator rise between 2005 and 2006? Why or why not?
- d. Does the GDP deflator rise between 2006 and 2007? Why or why not?

3. In recent years, many new parents (fathers and mothers alike) have chosen to quit their jobs to stay home and care for their children.
- What happens to GDP when both parents work before having children, but one decides to stay at home afterwards to take care of the kids full time?
 - How does this change in GDP compare to the change in the parents' well-being?

4. Go back to the same example from question 2, above. Consumers in the economy like two goods: pizza and beer. Prices and quantities consumed are the same as before:

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2005	\$2	1	\$2	1
2006	\$2	3	\$2	2
2007	\$4	3	\$8	2

- As a first step in computing the consumer price index (CPI), the Bureau of Labor Statistics surveys consumers to determine the "basket of goods" purchased by a typical consumer. Using 2005 as your base year, what is the basket of goods in this economy?
 - What is the cost of the basket in each year: 2005, 2006, and 2007?
 - Still using 2005 as the base year, what is the CPI in each year: 2005, 2006, 2007?
 - Is percentage change in the CPI between 2005 and 2007 in this question larger than, smaller than, or the same as the percentage change in the GDP deflator between 2005 and 2007 in question 2? What explains the difference, if any?
5. Explain what happens to the GDP deflator and the CPI in the United States when ...
- The price of fighter planes, newly-produced by Lockheed Martin (a US firm) and sold to the US Air Force, rises.
 - The price of a BMW (a car, newly-produced in Germany) sold to a US consumer rises.
 - The price of a Ford Taurus (a car, newly-produced in the US) sold to a US consumer rises.
 - The price of a Boeing 747 (a commercial aircraft, newly-produced in the US) sold to US Airways (a US firm) rises.
 - The price of a Boeing 747 (a commercial aircraft, newly-produced in the US) sold to British Airways (a foreign firm) rises.
6. In 1980, major US banks offered interest rates as high as 15% per year on savings accounts offered to consumers. By 2000, that rate had dropped to 5% per year. On the other hand, in 1980 the US inflation rate was about 14% per year, whereas in 2000, the US inflation rate was only 3% per year.
- What was the real interest rate in 1980? What was the real interest rate in 2000?
 - What was the nominal interest rate in 1980? What was the nominal interest rate in 2000?
 - For a consumer, which year – 1980 or 2000 – was a better time to put money in the bank? Why?

7. Explain *briefly* (in one, two, or three sentences):
- What do macroeconomist mean by the term “human capital?”
 - How does the process of “investing” in human capital resemble the process of investing in physical capital?
8. Macroeconomists sometimes think about the determinants of a nation’s standard of living with the help of an “aggregate production function” such as

$$Y = AF(L, K, H, N)$$

Where Y denotes real GDP, L the number of workers, K the stock of physical capital, H the stock of human capital, N the stock of natural resources, and A the stock of technological knowledge.

- What does it mean to say that holding the stock of knowledge fixed, the aggregate production function has the property of constant returns to scale?
 - Assuming that this aggregate production function has this property of constant returns to scale, rewrite the equation from above as one that shows how productivity depends on four determinants: physical capital per worker, human capital per worker, natural resources per worker, and the stock of technological knowledge.
9. Explain *briefly* (in no more than a sentence or two for each part) how the following public policies might help raise the US standard of living?
- The government decides to spend money to improve the quality of primary and secondary school education.
 - The government increases the budget for the National Science Foundation.
 - The government adopts policies that encourage US households to consume less and save more.
 - The government allows foreigners to build, own, and operate new factories in the US.
 - The government secures property rights so that all citizens can benefit in the future from their investments today.