

Case, Fair and Oster
Macroeconomics – Chapter 6 Problems
Measuring National Output and National Income.

Problem 1. Income and expenditure approaches to National Income

National income items:

Profits	\$ 900
Compensation of employees	\$ 5,300
TOTAL	\$ 6,200

GDP items

Consumption	\$ 5,000
Investment	\$ 1,000
Government purchases	\$ 1,000
Net exports: \$ 500 - \$ 700 =	\$ - 200
TOTAL	\$ 6,800

These of course are not quite the same, and there are some adjustments made to get to income:

- Start with GNP rather than GDP. However, there is nothing in the problem about incomes earned abroad or paid to the rest of the world, so in this problem we have to assume that GDP = GNP.
- Subtract **depreciation** from GNP to get Net National Product: **NNP = \$ 6,800 – \$600 = \$ 6,200**
Why? Because depreciation does not add to income (specifically, it is subtracted from a firm's revenue in computing profits; see the very nice text explanation on p. 112).
- Strictly, we should also add rental income, net interest, indirect taxes minus government subsidies to income, and some smaller items to income, but they are not given in this problem.
given in this problem (see p. 111, table 6.3)
- There is also likely to be a statistical discrepancy between the income and expenditure measures; see p. 112, table 6.4.

Problem 2. Income = Expenditure. The basic reason for the equality is that what is expenditure to the person ordering pizza is income to the pizza shop owner and her employees. The equality is embodied in the circular flow diagram (Figure 5-3, p. 93 of the text and my definitions on the course web page).

Problem 3-4. Real GDP and Nominal GDP.

Tables of real and nominal GNP are given in the text. More recent data (with computations for the final two columns provided in the text left as an exercise. Be sure you know how to do the computations).

The base year for recent GDP data is 2000; note that the annual average is used, so the real and nominal values for 2000.1 are not quite equal.

Date Nom. GDP Real GDP

2000.1	9,629.4	9,695.6
2001.1	10,021.5	9,875.6
2002.1	10,333.3	9,977.3
2003.1	10,705.6	10,126.0
2004.1	11,405.5	10,543.6
2005.1	12,155.4	10,875.8
2006.1	12,959.6	11,217.3
2007.1	13,510.9	11,357.8
2008.1	14,150.8	11,646.0
2009.1	14,097.2	11,360.5

Calculate the GDP deflator for 2000.1 and 2008.1, and 2009.1
(since real GDP = Nominal / Deflator, Deflator = Nominal / Real)
Answer: Deflator 2000.1 = 9629.4 / 9695.6 = 0.993 or 99.3
Deflator 2008.1 = 14,150.8 / 11,646.0 = 121.5
Deflator 2009.1 = 14,097.2 / 11,360.5 = 124.1
Inflation rate 2008.1 to 2009.1 = (124.1 – 121.5) / 121.5 = 2.1 %
Real GDP growth rate 2008.1 to 2009.1 =
11360.5 – 11646.0 / 11646.0 = minus 2.5 %
Of course the negative growth rate means the economy was in recession in 2008.

Problem 5. Double counting.

We avoid double counting of intermediate goods by counting only value added, or by looking only at final sales. Total sales will include the wheat and flour as well as the bread made from them, and clearly the final product is the bread.

Problem 6. Forecast of GDP and GDP per capita.

The authors were obviously too optimistic in their 2009 forecasts (see the table for Problems 3-4), but we will use their figures for the sake of illustration:

	2009	2010	
Real GDP	12,043	12,464	(in billions of dollars)
Population	306.4	308.8	(in millions of people)

Note that in dividing billions of dollars by millions of people, the result will be in thousands of dollars per person:

Per capita GDP for 2009 = $12,043 / 306.4 = 39.305$ (**\$ 39,305**)
 for 2010 = $12464 / 308.8 = 40.363$ (**\$ 40,363**)

Growth rate of per capita real GDP from 2009 to 2010:

$$\frac{40.363 - 39.305}{39.305} = .027 \text{ or } 2.7 \text{ percent.}$$

Growth rate of real GDP from 2009 to 2010:

$$\frac{12,464 - 12,043}{12,043} = .034968 \text{ or } 3.5 \text{ percent}$$

Problem 7. Growth rates from the *Economist* magazine.

Go to www.economist.com/markets/indicators and select (currently on the right hand side of that page), “Output, Prices and Jobs”. I am using the March 11, 2010 issue.

Growth rates given on both a year-on-year basis (that is, percent change from one year ago) and an annualized quarterly basis (that is, the percent change from last quarter multiplied by 4 to get an annualized rate). The year-on-year figures are a better indicator of the state of the economy; the quarterly rate may be a better indicator of where the economy is going.

For example, the US growth rate for the last quarter of 2009 is given as a very weak 0.1 percent from a year ago, but 5.9 percent on an annualized quarterly basis – indicating that the US has been in a severe recession, but the strong quarterly figure is an indication that the recession is (probably) coming to an end, though the unemployment rate at 9.7 percent is unusually high for the US. The forecast growth rates for 2010 and 2011 are strong at 3.1 percent and 2.9 percent.

It would be an easy question to ask if China or Britain were in a recession (check the data); a more difficult question might be whether Japan is in a recession.