Eco 242 Eshragh Motahar
Macroeconomic Theory and Policy

INTRODUCTION TO MACROECONOMICS
Macro Questions and Macro Data

A Quick Exercise

You are given the following production and price data for an imaginary economy. Assume that half the quantity of flour in each year goes into the production of bread by commercial bakeries, and the other half is sold directly to consumers for use at home. All other items are sold entirely and directly to consumers.

	1990		1991	
	total quantity	*price per unit ($)*	*total quantity*	*price per unit ($)*
Flour	10	1	12	1.5
Bread	14	1.5	18	2
Shirts	5	16	5	20
Chairs	1	19	2	25

a. Calculate the nominal GDP for this economy.

1990:

1991:

b. Calculate the real GDP (use 1990 as the base year) for this economy.

1990:

1991:

c. Calculate the GDP deflator (the price level) for 1991 (still using 1990 as the base year)

d. Calculate the rate of inflation between 1990 and 1991

Calculating a Chain-Weighted Output Index, and the GDP Deflator

[This section supplements the above material, and is **optional**. For this section please make sure to read the Appendix on p. 40 of the textbook, (again, optional).]

Recall that $\text{GDP Deflator}_t = \dfrac{\text{Nominal GDP}_t}{\text{Real GDP}_t} \times 100$

Or, using the notation in our course: $P_t = \dfrac{\text{Nominal GDP}_t}{Y_t} \times 100.$

Calculating nominal GDP is straightforward. The problem is how to calculate *Y*. Recall that in the above section we calculated real GDP and the GDP deflator in the traditional manner. Here, we will use the chain-weighted method.

Before we proceed, let's recapitulate by writing down answers to a through d above.

a. (1) Nominal GDP for 1990 = 125
(2) Nominal GDP for 1991 = 195

b. (1) Real GDP for 1990 (base year 1990) = 125
(2) Real GDP for 1991 (base year 1990) = 151

c. $P_{1991} = \dfrac{\text{Nominal GDP}_{1991}}{Y_{1991}} \times 100 = 129.14$

d. $\pi_{1991} = \dfrac{P_{1991} - P_{1990}}{P_{1990}} \times 100 = \dfrac{129.14 - 100.00}{100.00} \times 100 = 29.14\%$

Now, to calculate the real GDP using the *chain-weighted* method, do the following steps:

e. Calculate real GDP for 1990 using 1991 prices, we get:

$5 \times 1.5 + 14 \times 2 + 5 \times 20 + 1 \times 25 = 160.50.$

f. Calculate the rate of growth of real GDP (between 1990 and 1991) when 1990 prices are used:

$\dfrac{151 - 125}{125} \times 100 = 20.80\%.$

g. Calculate the rate of growth of real GDP (between 1990 and 1991) when 1991 prices are used:

$\dfrac{195 - 160.5}{160.5} \times 100 = 21.50\%.$

h. Take the geometric average of the two percentage growth rates in f and g above:

$\sqrt{20.80 \times 21.50} = 21.14\%.$

This is the rate of growth of *Y* between 1990 and 1991 using the chain-weighted method.

i. Apply the above growth rate to 125 to find the real (chain-weighted) GDP for 1991:

$125 + 0.2114 \times 125 = 151.43.$

j. Now, calculated the GDP deflator:

$$P_{1991} = \frac{195}{151.43} \times 100 = 128.77$$

k. Now, calculate the inflation rate using chain-weighted data:

$$\pi_{1991} = \frac{128.77 - 100}{100} \times 100 = 28.77\%.$$

Exercise

Consider the following expansion of the above table:

	1990		1991		1992	
	total quantity	*price per unit ($)*	*total quantity*	*price per unit ($)*	*total quantity*	*price per unit ($)*
Flour	10	1	12	1.5	16	1.25
Bread	14	1.5	18	2	20	2
Shirts	5	16	5	20	6	22
Chairs	1	19	2	25	3	28

(The disposition of flour remains as before.)

Calculate the rate of inflation between 1991 and 1992 using the chain-weighted GDP deflator for these two years.