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Exercise 2

Introduction to Macroeconomics

1. Is the following a stock or flow variable?

2.1 Inventories	Stock Variable	2.2 Change in Inventories	Flow Variable
2.3 Money Supply	Stock Variable	2.4 Change in Money Supply	Flow Variable
2.5 National Income	Flow Variable	2.6 Expenditure	Flow Variable
2.7 Wealth	Stock Variable	2.8 Population	Stock Variable
2.9 Capital	Stock Variable	2.10 Interest	Flow Variable

2. What is the difference between GDP and GNP? When looking at the US and China, which country do you expect to have higher GNP? Why?

GNP produces by input that located in their country, regardless of nationalities of producers while GNP owns by their country citizens, unthinking of where the output produced.

I expect US will have higher GNP than China because China has many recources and their materials are cheaper than other countries, so US may import substances from China and be the producer.

3. The canned apple has 5 stages of production as follows. Find the value added of each stage and the GDP value of the canned apple.

Stages of Production	Value of Sales	Value Added
Growing Apple	12	12
Pickling	15	3
Canning	18	3
Shipping	20	2
Retail Sale	22	2

∴ GDP value of the canned apple is 22

4. What is Transfer Payment? Why is it not included in GDP?

Transfer Payment is a transaction when money or goods change hands, which isn't included in the GDP because it doesn't create goods and services unless it's spent.

5. Why are we interested in Real GDP? Explain with examples. Is there a problem associated with Real GDP?

Real GDP makes people know the real value of production and they can make sure that it has the inflation or deflation during the time that they calculate GDP or not.

Example: 2000 P = 10, Q = 10 → nominal GDP_{2000} = 100

2001 P = 16, Q = 7 → nominal GDP_{2001} = 112

$real\ GDP_{2001} = P_{2000} \times Q_{2001}$

$= 10 \times 7$

$= 70$ (42 less than nominal GDP)

Even in 2001 has high GDP than 2000, but it's because the price rises while the quantity in 2000 is more than 2001 which show people's better standard of living.

Limitations of Real GDP:

GDP can't show real standard of living, health, political freedom, and real social of that country.

6. Suppose 2018 is the base year. What can we say about Real GDP, Nominal GDP, and GDP Deflator of 2018?

$$\text{GDP Deflator}_{2018} = \frac{\text{Nominal GDP}_{2018}}{\text{Real GDP}_{2018}} \times 100$$

7. Explain three limitations of the GDP concept.

1. Inequality : GDP doesn't show the distrbution of output among in society.
2. GDP doesn't count the illegal income which is a informal economy.
3. GDP doesn't consider the cost and benefits from pollution and environment costs.

8. In 2018, Kingdom Asgard made the following transactions. Using the expenditure approach, identify which component of GDP is affected by each transaction, and calculate the 2018 GDP.

C - The citizens bought 8 new cars, each worth 50$. $8 \times 50 = 400$ $

C - The citizens bought 4 new houses, each worth 150$. $4 \times 150 = 600$ $

C - The citizens grew rice for their own consumption. The rice was worth 500$. X

I - The firms bought 6 used machines, each worth 50$. X

I - The firms bought 8 car parts, each worth 25$. X

G - The government bought 4 new computers, each worth 50$. 200 $

G - The government paid 1000$ to the poor as welfare payment. X

M - The citizens bought 10 imported ships, each worth 100$. $10 \times 100 = 1000$ $

X - The firms sold 4 planes abroad, each worth 200$. $4 \times 200 = 800$ $

$GDP = C + I + G + (X - M)$

$GDP = 1000 + 200 - 200$

$GDP = 1000$ #

$C = 400 + 600 = 1000$

$G = 200$

$X - M = -200$

9. Suppose that there are three goods in the economy – goods A, B, and C. Calculate Nominal GDP, Real GDP, and GDP Deflator when 2012 is the base year. Also, calculate the annual inflation rate from 2014 to 2015.

Year	Price of A	Quantity of A	Price of B	Quantity of B	Price of C	Quantity of C
2012	1	3	2	3	3	3
2013	3	1	4	2	1	4
2014	2	2	3	4	2	1
2015	4	4	1	1	4	2

Year	Nominal GDP	Real GDP	GDP Deflator
2012	$3+6+9 = 18$	$3+6+9 = 18$	$\frac{18}{18} \times 100 = 100$
2013	$3+8+4 = 15$	$1+4+12 = 17$	$\frac{15}{17} \times 100 = 88.24$
2014	$4+12+2 = 18$	$2+8+3 = 13$	$\frac{18}{13} \times 100 = 138.46$
2015	$16+1+8 = 25$	$4+2+6 = 12$	$\frac{25}{12} \times 100 = 208.33$

Annual inflation rate from 2014 to 2015 is $\frac{208.33 - 138.46}{138.46} \times 100$

$= 50.46\ \%$

10. Using the table below, calculate GNP and NNP.

	Billions of Dollars
GDP	8000
Receipts of factor income from the rest of the world	250
Payments of factor income to the rest of the world	300
Depreciation	900
Indirect taxes minus subsidies	500
Corporate profits minus dividends	500
Social insurance payments	700
Personal interest income received from the government and consumers	300
Transfer payments to persons	1100
Personal taxes	1000

GNP = GDP + NFFI

GNP = 8000 + (250 - 300)

GNP = 7950

NNP = GNP - Depreciation

NNP = 7950 - 900

NNP = 7050

11. Using the table below, Calculate the following items.

11.1 Gross domestic investment

11.2 GDP, using the expenditure approach

11.3 GNP

11.4 NNP

11.3 National Income, using the income approach

(Do not worry if NNP and NI differ greatly.)

Table 6.5

Depreciation	168.0
Compensation of employees	1,407.7
Corporate profits	257.6
Dividends	78.4
Exports	212.8
Government purchases	716.8
Imports	235.2
Indirect taxes	593.6
Net interest income	182.2
Net private domestic investment	784.0
Personal consumption expenditures	2,203.2
Personal interest income	112.0
Receipts of factor income from the rest of the world	35.2
Personal taxes	627.2
Proprietor's income	173.9
Payments of factor income to the rest of the world	68.8
Rental income	34.1
Social insurance payments	380.8
Subsidies	44.8
Transfer payments	504.0

11.1) Gross domestic investment = 952 (I)

Net private domestic investment : Gross investment - depreciation

784 = X - 168

952 = X

11.2) GDP = C + I + G + (X - M)

GDP = 2203.2 + 952 + 716.8 + (212.8 - 235.2)

GDP = 3849.6

11.3) GNP = GDP + NFFI

GNP = 3849.6 + (35.2 - 68.8)

GNP = 3816

11.4) NNP = GNP - Depreciation

NNP = 3816 - 168

NNP = 3648

11.5) NI = NNP

NI = 1407.7 + 257.6 + 593.6 + 182.2 + 173.9 + 34.1 + 44.8

NI = 2604.3

12. In a simple economy, suppose that all income is either compensation of employees or profits. Suppose also that there are no indirect taxes. Calculate GDP from the table below. Show that the expenditure approach and the income approach add up to the same figure.

(Hints: (1) NNP + Depreciation = GNP, (2) NFFI = 0, and (3) NI = NNP)

C	Consumption	9500
I	Investment	3000
	Depreciation	1750
	Profits	2400
X	Exports	850
	Compensation of employees	11500
G	Government purchases	3200
	Direct taxes	1200
	Saving	1600
M	Imports	900

$GDP = C + I + G + (X - M)$

$GDP = 9500 + 3000 + 3200 + (850 - 900)$

$GDP = 15650$

$GNP = GDP - NFFI$

$GNP = 15650 - 0$

$GNP = 15650$ #

$NNP = 15650 - 1750$

$NNP = 13900$ #

$NI = NNP$

$NI = 13900$