

Exercise 2

National Output and National Income

1. Is the following a stock or flow variable?

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

4. What is Transfer Payment? Why is it not included in GDP?
5. Why are we interested in Real GDP? Explain with examples. Is there a problem associated with Real GDP?
6. Suppose 2018 is the base year. What can we say about Real GDP, Nominal GDP, and GDP Deflator of 2018?
7. Explain three limitations of the GDP concept.
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.
 - The citizens bought 8 new cars, each worth 50\$.

- The citizens bought 4 new houses, each worth 150\$. *600 (C)*
- The citizens grew rice for their own consumption. The rice was worth 500\$. *not count*
- The firms bought 6 used machines, each worth 50\$. *not count*
- The firms bought 8 car parts, each worth 25\$. *200 (I)*
- The government bought 4 new computers, each worth 50\$. *200 (C)*
- The government paid 1000\$ to the poor as welfare payment. *not count*
- The citizens bought 10 imported ships, each worth 100\$. *1000 (M)*
- The firms sold 4 planes abroad, each worth 200\$. *800 (E)*

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			
2013			
2014			
2015			

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

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

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) $NNP + \text{Depreciation} = GNP$, (2) $NFFI = 0$, and (3) $NI = NNP$)

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

1) stock, flow, stock, flow, flow, flow, stock, stock
stock, flow

2) GDP: The total market value of all final goods and services produced in a country

GNP: The total factor income earned by residents of a country

GNP US > China because US has base of production in China

3) 12, 3, 3, 2, 2 $\therefore$ Total value added = 22

4) Is a payments by the governments to households for which no goods and service is provided in return.

- Because it's already counted when it was produce (goods and service) and it's part of personal income so, it doesn't link to any economic transaction.

5) Real GDP is a corrected GDP for annual price change, it cuts the effect of inflation out.

Ex. 2020 $P = 10$ $Q = 10$ nominal GDP = 100

2019 $P = 5$ $Q = 15$ nominal GDP = 75

$\therefore$ assume that 2019 is base year the real GDP will equal to $5 \times 10 = 50$.

6) Real GDP will be equal to nominal GDP as 2018 is the base year.

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100$$

$\therefore$ so GDP deflator will equal to 100

7) Inequality: GDP doesn't say about individual output among society

Informal economic: GDP doesn't count the income for hidden part in the economic

Externality: GDP doesn't take in account of third party (e.g. pollution)

8) - C = 400 \$

- C = 600 \$

- not count

- not count

- 200 \$ (I)

- 200 \$ (F)

- not count

- 1000 \$ (M)

- 800 \$ (X)

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

$$= 400 + 600 + 200 + 200$$

$$+ (800 - 1000)$$

$$= 1200$$

9)

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

2012 $3 \times 1 + 2 \times 3 = 9$ $3 \times 1 + 2 \times 3 = 9$

2013 $3 \times 3 + 4 \times 1 = 13$ $1 \times 3 + 4 \times 2 = 11$

2014 $2 \times 2 + 3 \times 2 = 10$ $2 \times 2 + 3 \times 4 = 16$

2015 $4 \times 4 + 1 \times 1 = 17$ $4 \times 2 + 1 \times 1 = 9$

GDP Deflator

$\frac{9}{9} \times 100 = 100$

$\frac{13}{11} \times 100 = 118.18$

$\frac{10}{9} \times 100 = 111.11$

$\frac{17}{9} \times 100 = 188.89$

annual inflation rate (2014-2015) = $\frac{188.89 - 111.11}{111.11} \times 100$
 $= 69.99\%$

10)

	Billions of Dollars
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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

$$GNP = GDP + \text{net foreign factor income}$$

$$= 8000 + 250 - 300 = 7950$$

$$NNP = GNP - \text{depreciation} = 7950 - 900 = 7050$$

11)

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

11.1 Gross domestic investment $784 + 168 = 952$

11.2 GDP, using the expenditure approach 3849.6

11.3 GNP 3816

11.4 NNP 3648

11.3 National Income, using the income approach 3648

(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
K	Exports	212.8
G	Government purchases	716.8
M	Imports	235.2
	Indirect taxes	593.6
	Net interest income	182.2
	Net private domestic investment	784.0
C	Personal consumption expenditures	2,203.2
	Personal interest income	112.0
	Receipts of factor income from the rest of the world	35.2
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	Proprietor's income	173.9
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	Rental income	34.1
	Social insurance payments	380.8
	Subsidies	44.8
	Transfer payments	504.0

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

$$= 2203.2 + 952 + 716.8 + 212.8 - 235.2$$

$$= 3849.6$$

$$GNP = 3849.6 + (35.2 - 68.8) = 3816$$

$$NNP = 3816 - 168 = 3648$$

12)

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

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

$$= 9500 + 3000 + 3200 + 850 - 900$$

$$= 15650$$