

Exercise 2

National Output and National Income

- Is the following a stock or flow variable?
 - Inventories *stock*
 - Change in Inventories *flow*
 - Money Supply *stock*
 - Change in Money Supply *flow*
 - National Income *flow*
 - Expenditure *flow*
 - Wealth *stock*
 - Population *stock*
 - Capital *stock*
 - Interest *flow*
- 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?
- 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	value of sales	value added
Growing Apple	12		12	12
Pickling	15		15	3
Canning	18		18	3
Shipping	20		20	2
Retail Sale	22		22	2

GDP = 22

- What is Transfer Payment? Why is it not included in GDP?
- Why are we interested in Real GDP? Explain with examples. Is there a problem associated with Real GDP?
- Suppose 2018 is the base year. What can we say about Real GDP, Nominal GDP, and GDP Deflator of 2018?
- Explain three limitations of the GDP concept.

- inequality: level of people doesn't affect GDP
- externality: environment
- informal market: illegal product

- 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\$.

$$C : 8 \times 50 = 400$$

- The citizens bought 4 new houses, each worth 150\$. $4 \times 150 = 600$
 - The citizens grew rice for their own consumption. The rice was worth 500\$.
 - The firms bought 6 used machines, each worth 50\$.
 - The firms bought 8 car parts, each worth 25\$.
 - The government bought 4 new computers, each worth 50\$. $4 \times 50 = 200$
 - The government paid 1000\$ to the poor as welfare payment.
 - The citizens bought 10 imported ships, each worth 100\$. $10 \times 100 = 1000$
 - The firms sold 4 planes abroad, each worth 200\$. $4 \times 200 = 800$
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	3	3	2	3	3	3
2013	1	4	4	2	1	4
2014	2	3	3	4	2	1
2015	4	1	1	1	4	2

Year	Nominal GDP	Real GDP	GDP Deflator
2012			
2013			
2014			
2015			

Real GDP

$3 \times 3 + 2 \times 3 = 18$

$1 \times 4 + 4 \times 2 = 15$

$2 \times 3 + 3 \times 4 = 18$

$4 \times 1 + 1 \times 1 = 5$

Real GDP

$P_{2012} \times Q_{2012} = 18$

$P_{2012} \times Q_{2013} = 15$

$P_{2012} \times Q_{2014} = 18$

$P_{2012} \times Q_{2015} = 12$

GDP Deflator

100

83.3

133.3

204.3

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

$$\begin{aligned}
 \text{NNP} &= \text{GNP} - \text{depreciation} \\
 &= 7950 - 900 = 7050
 \end{aligned}$$

	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 $GDI = NDI + Depreciation = 784 + 168 = 952$

11.2 GDP, using the expenditure approach $C + I + G + (X - M)$

11.3 GNP $GDP + NPI = 7949.6 + 352 - 64.8 = 8236.8 = 2,203.2 + 152 + 716.8 + (112.8 - 233.2) = 3849.6$

11.4 NNP $GNP - dep = 3846 - 168 = 3646$

11.3 National Income, using the income approach $= 11402.7 + 252.6 + 593.6 + 1028$

(Do not worry if NNP and NI differ greatly.) $+ 73.9 + 74.1 - 44.8 = 3604.3$

Table 6.5

Depreciation	168.0	wage
Compensation of employees	1,407.7	
Corporate profits	257.6	
Dividends	78.4	
(N) Exports	212.8	
(N) Government purchases	716.8	
(N) Imports	235.2	
(N) Indirect taxes	593.6	without tax
Net interest income	182.2	interest
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	
Personal taxes	627.2	
Proprietor's income	173.9	non-corporate profit
Payments of factor income to the rest of the world	68.8	
Rental income	34.1	profit
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) $NI = NNP$)

(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

expenditure approach

$$GDP = C + I + G + (X - M) = 9500 + 3000 + 3200 + (850 - 900)$$

$$= 15,650$$

income approach

$NI = NNP$, $GDP = NNP + \text{depreciation}$, $GNP = GDP$ when $NFFI = 0$

$$GDP = 2400 + 11500 + 1750$$

$$= 15,650$$

② GDP and GNP

GDP : final goods / services (product)
: given period
: within a country

GNP : final product
: given period
: country's citizen

4. Transfer payment is a cash payment made by government to citizens or you can say it's a free payments without any production e.g. welfare payment.

	P	Q
2018	10	2
2019	20	1

year 2018

$$\begin{aligned} \text{Real GDP}_{2018} &= P_{2018} \times Q_{2018} = 10(2) = 20 \\ \text{Real GDP}_{2019} &= P_{2019} \times Q_{2019} = 20(1) = 20 \end{aligned} \quad \left. \vphantom{\begin{aligned} \text{Real GDP}_{2018} \\ \text{Real GDP}_{2019} \end{aligned}} \right\} 2018 > 2019$$

Real GDP focus changes in quantity being produced and not focus changes in price.

Problems [supply shift, price changed
structural changes, price fluctuated

Real GDP : the production of G&S valued at fixed price (base year)

Nominal GDP : the production of G&S valued at current price

↳ Real GDP when 2018 (base year)

$$\text{GDP deflator} = \text{overall price level} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$8. \text{ EDP} = ct + G + (x - m) = 400 + 600 + 200 + (800 - 1000) = 1000_{\neq}$$