

Exercise 2

1. Is the following a stock or flow variable?

1.1 Inventories **stock variables**

1.2 Change in Inventories **flow variables**

1.3 Money Supply **stock variables**

1.4 Change in Money supply **flow variables**

1.5 National Income **flow variables**

1.6 Expenditure **flow variables**

1.7 Wealth **stock variables**

1.8 Population **stock variables**

1.9 Capital **stock variables**

1.10 Interest **flow variables**

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?

GDP - a measure of domestic economic activity.

GNP - a measure of economic well-being of the country's nationals.

- China has higher GNP than US because china has more income from abroad more than US.

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

(value Added)

$$\begin{aligned}
 \text{GDP} &= \text{sum of value-added} \\
 &= 12 + 3 + 3 + 2 + 2 \\
 &= 22 \text{ \#}
 \end{aligned}$$

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

- Transfer Payment is a one-way payment to a person or an organization which has given or exchanged no goods or services for it.
e.g. social security payment, unemployment benefits, welfare, etc.
- It's not included in GDP because they don't reflect actual production within the economy.

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

- because we want to see the actual output that has been adjusted for inflation

Examples: If price $\uparrow$, people consume $\downarrow$ that mean Real GDP doesn't concern on people consumption

Problem: If the economy structure change, the base year (which is used to calculate in real GDP) must be change too.

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

$$\text{Real GDP}_{2018} = \text{Nominal GDP}_{2018}$$

$$\text{GDP deflator}_{2018} = 100$$

7. Explain three limitations of the GDP concept

- 1.) Inequality $\rightarrow$ GDP per capita = output/person
not say about the distribution of output
- 2.) Informal Economy $\rightarrow$ doesn't count the unreported income generated in the hidden part of economy.

3.) Externality → pollution and environmental cost.

8. In 2018, Kingdom Argard made the following transaction. 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\$

Consumption ↑ 400

- The citizens bought 4 new houses, each worth 150 \$

Investment ↑ 600

- The citizens grow rice for their own consumption. The rice was worth 500 \$

Not included in GDP

- The firms bought 6 used machines, each worth 50\$

Not included in GDP

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

Not included in GDP

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

Government Spending ↑ 200

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

Not included in GDP

- The citizens bought 10 imported ships, each worth 100 \$.

Import ↓ 1000

- The firms sold 4 planes abroad, each worth 200 \$.

export ↑ 800

$$\% \text{ GDP} = 400 + 600 + 200 + 800 - 1000 = 1000 \text{ \$}$$

9. Suppose that there are three goods in economy - goods A, B, and C. Calculated 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	$3+6+9 = 18$	$3+6+9 = 18$	100%
2013	$3+8+4 = 15$	$1+4+12 = 17$	88.235%
2014	$4+12+2 = 18$	$2+8+3 = 13$	138.46%
2015	$16+1+8 = 25$	$4+2+6 = 12$	208.33%

$$\begin{aligned} &\text{annual inflation} \\ &\text{2014 - 2015} \\ &= \frac{208.33 - 138.46}{138.46} \times 100 \\ &= 50.46\% \end{aligned}$$

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

$$\begin{aligned} \text{GNP} &= \text{GDP} + \text{NFFI} \\ \text{GNP} &= 8000 + 250 - 300 \\ \text{GNP} &= 7950 \text{ \#} \end{aligned}$$

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

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

Table 6.5	
Depreciation	168.0
Compensation of employees	1,407.7
Corporate profits	257.6
Dividends	78.4
Exports	X 212.8
Government purchases	G 716.8
Imports	M 235.2
Indirect taxes	593.6
Net interest income	182.2
Net private domestic investment	784.0
Personal consumption expenditures	C 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 (minus)	44.8
Transfer payments	504.0

11.1 Gross domestic investment

$$GDP = NNP + \text{Depreciation}$$

$$GDP = 784 + 168 = 952 \#$$

11.2 GDP, using the expenditure approach

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

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

$$235.2$$

$$= 3849.6 \#$$

11.3 GNP

$$GNP = GDP + NFFI$$

$$= 3849.6 + 35.2 - 68.8$$

$$= 3816 \#$$

11.4 NNP

$$NNP = GNP - \text{Depreciation}$$

$$= 3816 - 168$$

$$= 3648 \#$$

11.5 National Income, using the income approach
(Do not worry if NNP and NI differ greatly.)

$$1407.7 + 173.9 + 34.1 + 257.6 + 182.2 + 593.6 - 44.8$$

$$= 2604.3 \#$$

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

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

$$\begin{aligned}
 GDP &= C + I + G + (X - M) \\
 &= 9500 + 3000 + 3200 + 850 - 900 \\
 &= 15650
 \end{aligned}$$

$$\begin{aligned}
 GNP &= GDP + NFFI \\
 &= 15650 + 0 \\
 &= 15650
 \end{aligned}$$

$$\begin{aligned}
 NNP &= GNP - \text{depreciation} \\
 &= 15650 - 1750 \\
 &= 13900
 \end{aligned}$$

$$\begin{aligned}
 NNP &= NI \\
 13900 &= 11500 + 2400 \\
 13900 &= 13900 \quad \#
 \end{aligned}$$

Exercise 2

National Output and National Income

1. Is the following a stock or flow variable?
 - 2.1 Inventories **stock variable**
 - 2.2 Change in Inventories **f**
 - 2.3 Money Supply **st**
 - 2.4 Change in Money Supply **f**
 - 2.5 National Income **f**
 - 2.6 Expenditure **f**
 - 2.7 Wealth **st**
 - 2.8 Population **st**
 - 2.9 Capital **st**
 - 2.10 Interest **f**
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
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6. Suppose 2018 is the base year. What can we say about Real GDP, Nominal GDP, and GDP Deflator of 2018?
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 - The government bought 4 new computers, each worth 50\$.
 - The government paid 1000\$ to the poor as welfare payment.
 - The citizens bought 10 imported ships, each worth 100\$.
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2014			
2015			

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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
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