

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
Pickling	15
Canning	18
Shipping	20
Retail Sale	22

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\$.

Exercise 2

- ①
- | | |
|-----------|-----------|
| 1.1 stock | 1.2 flow |
| 1.3 stock | 1.4 flow |
| 1.5 flow | 1.6 flow |
| 1.7 stock | 1.8 stock |
| 1.9 stock | 1.10 flow |

② GDP is value of output produced in a country. GNP is value of all G&S produced by country's citizens. I expect that China have higher GNP because China have more population than the US.

③

	Value added
Growing Apple	12
Pickling	3
canning	3
shipping	2
Retail sale	2

GDP value of the canned apple = 22

④ Transfer payment is a public expenditure made for a purpose other than procuring goods or services. This not include in GDP because no new G & S are produced.

⑤ Because Nominal GDP can mislead us, so we have to look at real GDP too. For example
year 2020 $P=20$ $Q=5$ \rightarrow nominal GDP is 100
year 2019 $P=4$ $Q=20$ \rightarrow nominal GDP is 80
If we look at nominal GDP year 2020 is better than 2019, but if we look at the price and the output, year 2019 is better. This mean that the nominal GDP in year 2020 seems better might because of inflation.

⑥ GDP Deflator is a measure of the overall price level. Real GDP is the price in 2018 (base year)
Nominal GDP is the price in desired year.

- ⑦
- The exclusion of non-market transactions: tasks that do not involve in market transactions.
 - The failure to account for or represent the degree of income inequality in society: GDP cannot reveal the real overall market value because it include other factor.
 - The failure to indicate whether the nation's rate of growth is sustainable or not: There might have inflation or deflation, so the GDP cannot confirm that the nations growth rate is sustainable or not.

- The citizens bought 4 new houses, each worth 150\$.
- 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\$.
- The government paid 1000\$ to the poor as welfare payment.
- The citizens bought 10 imported ships, each worth 100\$.
- The firms sold 4 planes abroad, each worth 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	18	18	100
2013	15	17	88.24
2014	18	23	78.26
2015	25	11	227.27

Inflation rate

$$= \frac{(227.27 - 78.26)}{78.26}$$

$$\approx 1.904 = 190.4\%$$

✖

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

$$\text{GNP} = \text{GDP} + (\text{NNFI})$$

$$= 8000 + 250 - 300$$

$$\text{GNP} = 7950 \quad \text{✖}$$

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

$$= 7950 - 900$$

$$\text{NNP} = 7050 \quad \text{✖}$$

⑧	- Consumption	\$50 × 8 = 400	
	- investment	\$150 × 4 = 600	
	- investment	\$500 = 500	
	- investment	\$50 × 6 = 300	
	- Consumption	\$25 × 8 = 200	
	- government spending	\$50 × 4 = 200	
	- government spending	\$1000 = 1000	
	- imports	\$100 × 10 = \$1000	} (X - M) = 800 - 1000 = -200
	- exports	\$200 × 4 = \$800	

$$\text{GDP}_{2018} = C + I + G + (X - M) = \$3000$$

	Q ₁	Q ₂	P ₁	P ₂	P ₁ × Q ₁	P ₁ × Q ₂	P ₂ × Q ₁	P ₂ × Q ₂
Goods A	3	1	1	3	1 × 3 = 3	1 × 1 = 1	3 × 3 = 9	3 × 1 = 3
Goods B	3	2	2	4	2 × 3 = 6	2 × 2 = 4	4 × 3 = 12	4 × 2 = 8
Goods C	3	4	3	1	3 × 3 = 9	3 × 4 = 12	1 × 3 = 3	1 × 4 = 4
total					= \$18	= \$17		
					Nominal GDP yr 1	real GDP of yr 2		

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

	Billions of Dollars	
GDP	8000	} GNP = 7950
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 784

11.2 GDP, using the expenditure approach 3591.6

11.3 GNP 6699.9

11.4 NNP 6531.9

11.3 National Income, using the income approach 3103.3

(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

$$GDP = 9500 + 3000 + 3200 + (850 - 900)$$
$$= 15650$$

$$GNP = GDP + NFFI$$
$$= 15650 + 0$$
$$= 15650$$

$$NNP = GNP - \text{Depreciation}$$
$$= 15650 - 1750$$
$$= 13900$$

$$NI = NNP$$

$$NI = 13900$$