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Exercise 2
National Output and National Income

1. Is the following a stock or flow variable?
   2.1 Inventories stock
   2.2 Change in Inventories flow
   2.3 Money Supply stock
   2.4 Change in Money Supply flow
   2.5 National Income flow
   2.6 Expenditure flow
   2.7 Wealth stock
   2.8 Population stock
   2.9 Capital stock
   2.10 Interest flow
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

22

GDP = 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$. C : 8×50 = 400

② GDP : measure the value market within the country

GNP : measure the profit of national's producer regardless of where the company located.

The US's GDP < china's GDP

US's GNP > china's GNP

This is because there are more US's company than china's

④ Transfer payment is a money that the goverment give to people for free, but it is not goods or services that's why it is not included in GDP

⑤ e.g.

year	P	Q
2019	10	2
2020	20	1

* 2019 is base year

Nominal GDP_{2019} : $10 \times 2 = 20$

Nominal GDP_{2020} : $20 \times 1 = 20$

Real GDP_{2019} : $10 \times 2 = 20$

Real GDP_{2020} : $10 \times 1 = 10$

∴ when consider the Real GDP, we can see that 2019 is actually better

Problems

1. Supply shift
2. structural changed

⑥ Real GDP : The market value of G&S adjusted for price change

Nominal GDP : The market value of G&S evaluated at current market prices

$\text{Nominal GDP}_{2018} = \text{Real GDP}_{2018}$ when 2018 is base year

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

⑦ 1. Inequality : people's income doesn't affect GDP

2. Informal market : illegal product

3. Externality : environment

⑧ $GDP = C + I + G + (X - M)$

$= (600 + 400) + 200 + (800 - 1{,}000)$

$= 1{,}000$ ※

- The citizens bought 4 new houses, each worth 150$. (C) : 4×150 = 600
- The citizens grew rice for their own consumption. The rice was worth 500$. ✗
- 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$. (G) : 4×50=200
- The government paid 1000$ to the poor as welfare payment. ✗
- The citizens bought 10 imported ships, each worth 100$. (M) : 10×100=1000
- The firms sold 4 planes abroad, each worth 200$. (X) : 4×200=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	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

$\frac{208.3 - 138.5}{138.5} \times 100\% = 50\%$

Year	Nominal GDP	Real GDP	GDP Deflator
2012	18	18	$\frac{18}{18} \times 100 = 100$ (base year)
2013	15	$P_{2012} \times Q_{2013} = 17$	$\frac{15}{17} \times 100 = 88.24$
2014	18	13	$\frac{18}{13} \times 100 = 138.5$
2015	25	12	$\frac{25}{12} \times 100 = 208.3$

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

GNP = GDP + NFFI

= 8000 + (250 − 300)

= 7950 ※

NNP = GNP − depreciation

= 7950 − 900

= 7,050 ※

	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

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

11.3 GNP GDP - NFFI =

11.4 NNP GNP - depreciation =

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
X	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
	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

(11.)

11.1) GDI = NDI + depreciation

(I)

= 784 + 168 = 952

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

= 2,203.2 + 952 + 716.8 + (212.8 - 235.2)

= 3,849.6 ※

11.3) GNP = GDP + NFFI

= 3849.6 + (35.2 - 68.8) = 3,816

11.4) NNP = GNP - depreciation = 3,816 - 168 = 3,648 ※

11.5) NI = NNP

1407.7 + 257.6 + 593.6 + 182.2 + 173.9 + 34.1 + 44.8 = 2,604.3 ※

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

- expenditure approach

$GDP = C + I + G + (x - m)$

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

$= 15,650$ ※

- Income approach

$NI = NNP$, $GNP = NNP + Depreciation$, $GNP = GDP$ when $NFFI = 0$

$GDP - Depreciation = profits + compensation$

$GDP = 2400 + 11500 + 1750$

$= 15,650$ ※