

| Year | Price of Rice (Tk) | Quantity of Rice (kg) | Price of Cloths (Tk) | Quantity of Cloths |
|------|--------------------|-----------------------|----------------------|--------------------|
| 2020 | 10                 | 30                    | 20                   | 50                 |
| 2021 | 20                 | 45                    | 30                   | 70                 |
| 2022 | 30                 | 60                    | 40                   | 90                 |

Given that 2020 is the base year.

- (1) Calculate the real GDP and nominal GDP for each year
- (2) Calculate the GDP deflator for each year
- (3) Calculate the economic growth for each year
- (4) Calculate the CPI for each year
- (5) Calculate the Inflation rate for each year by using the CPI index

**Answer**

**(1)** We know, nominal GDP = Current year price \* Current year quantity

Therefore, NGDP 2020 = (10\*30) + (20\*50) = 300 + 1000 = 1300 Tk.

NGDP 2021 = (20\*45) + (30\*70) = 900 + 2100 = 3000 Tk.

NGDP 2022 = (30\*60) + (40\*90) = 1800 + 3600 = 5400 Tk.

We know, real GDP = base year price \* Current year quantity

Therefore, RGDP 2020 = (10\*30) + (20\*50) = 300 + 1000 = 1300 Tk.

RGDP 2021 = (10\*45) + (20\*70) = 450 + 1400 = 1850 Tk.

RGDP 2022 = (10\*60) + (20\*90) = 600 + 1800 = 2400 Tk.

**(2)** We know GDP Deflator =  $\frac{NGDP}{RGDP} * 100$

Therefore, GDP Deflator 2020 =  $\frac{NGDP\ 2020}{RGDP\ 2020} * 100 = \frac{1300}{1300} * 100 = 100$

GDP Deflator 2021 =  $\frac{NGDP\ 2021}{RGDP\ 2021} * 100 = \frac{3000}{1850} * 100 = 162.16 = 162$

GDP Deflator 2022 =  $\frac{NGDP\ 2022}{RGDP\ 2022} * 100 = \frac{5400}{2400} * 100 = 225$

**(3)** We know economic growth rate =  $\frac{Real\ GDP\ this\ year - Real\ GDP\ previous\ year}{Real\ GDP\ previous\ year} * 100$

Therefore,

Economic growth for 2020 =  $\frac{Real\ GDP\ in\ 2020 - Real\ GDP\ in\ 2019}{Real\ GDP\ in\ 2019} * 100$

Since no data is available for 2019, we can't estimate economic growth for 2020.

Now, Economic growth for 2021 =  $\frac{Real\ GDP\ in\ 2021 - Real\ GDP\ in\ 2020}{Real\ GDP\ in\ 2020} * 100$

=  $\frac{1850 - 1300}{1300} * 100 = 42.31\ %$

Economic growth rate in 2021 is 42.31%, which means that the real GDP is increased by 42.31% from 2020 to 2021.

$$\begin{aligned}\text{Economic growth for 2022} &= \frac{\text{Real GDP in 2022} - \text{Real GDP in 2021}}{\text{Real GDP in 2021}} * 100 \\ &= \frac{2400 - 1850}{1850} * 100 = 29.73\%\end{aligned}$$

Economic growth rate in 2022 is 29.73%, which means that the real GDP is increased by 29.73% from 2021 to 2022.

**(4)**

We Know that

$$\text{CPI} = (\text{Cost of the basket in the current period} / \text{Cost of the basket in the base year}) * 100.$$

In the above table, given that 2020 is the base year. Therefore, we fix the basket of 2020 as CPI basket which contains 30 unit of rice and 50 unit of cloths.

Therefore,

$$\text{The cost of the basket in 2020} = (10*30) + (20*50) = 300 + 1000 = 1300$$

$$\text{The cost of the basket in 2021} = (20*30) + (30*50) = 600 + 1500 = 2100$$

$$\text{The cost of the basket in 2022} = (30*30) + (40*50) = 900 + 2000 = 2900$$

So,

$$\begin{aligned}\text{CPI in 2020} &= (\text{Cost of the basket in 2020} / \text{Cost of the basket in 2020}) * 100 \\ &= (1300 / 1300) * 100 = 100\end{aligned}$$

$$\begin{aligned}\text{CPI in 2021} &= (\text{Cost of the basket in 2021} / \text{Cost of the basket in 2020}) * 100 \\ &= (2100 / 1300) * 100 = 161.54\end{aligned}$$

$$\begin{aligned}\text{CPI in 2022} &= (\text{Cost of the basket in 2022} / \text{Cost of the basket in 2020}) * 100 \\ &= (2900 / 1300) * 100 = 223.08\end{aligned}$$

**(5)**

$$\text{We know inflation rate} = \frac{\text{CPI this year} - \text{CPI previous year}}{\text{CPI previous year}} * 100$$

Therefore,

$$\text{Inflation rate in 2020} = \frac{\text{CPI in 2020} - \text{CPI in 2019}}{\text{CPI in 2019}} * 100$$

Since no data is available for 2019, we can't estimate inflation rate for 2020.

$$\text{Now, Inflation rate in 2021} = \frac{\text{CPI in 2021} - \text{CPI in 2020}}{\text{CPI in 2020}} * 100 = \frac{161.54 - 100}{100} * 100 = 61.54\%$$

Inflation rate in 2021 is 61.54%, which means that the overall price level is increased by 61.54% from 2020 to 2021.

$$\text{Inflation rate in 2022} = \frac{\text{CPI in 2022} - \text{CPI in 2021}}{\text{CPI in 2021}} * 100 = \frac{223.08 - 161.54}{161.54} * 100 = 38.09\%$$

Inflation rate in 2022 is 38.09%, which means that the overall price level is increased by 38.09% from 2021 to 2022.