

Past-paper walk-through

Price Indices and Inflation ■ 2.4

eXercise

Questions in this set

- 2024 Set 1 Q2
- 2024 Set 2 Q2
- 2022 Set 1 Q2
- 2021 Set 1 Q3

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 2

2024 Set 1 ■ Q2

The table provided shows economic data for the country of Louland. The base year is year 1, and the GDP deflator in year 2 is 115.

	Year 1	Year 2
Nominal GDP	800,000	1,035,000
Population	1,000	1,200

Question 2

- (a) Calculate real GDP in Louland in year 2. Show your work.
- (b) How would the change in real GDP from year 1 to year 2 affect the demand for money and the nominal interest rate in Louland?
- (c) Did the standard of living of the average citizen in Louland increase, decrease, or remain the same from year 1 to year 2? Explain using numbers.
- (d) What was the numerical value of the inflation rate from year 1 to year 2?
- (e) If nominal wages increased by 10% from year 1 to year 2, what happened to the real wages of workers in Louland during this time? Explain.

Solution 2

(a)

Mark scheme

- Real GDP = $(\text{Nominal GDP} \div \text{GDP Deflator}) \times 100 = (1,035,000 \div 115) \times 100 = 900,000$.

Solution 2

(b)

Mark scheme

- Real GDP increased from year 1 to year 2, so the demand for money increases (more transactions require money at each price level). With the money supply unchanged, the money demand curve shifts right, so the nominal interest rate increases.

Solution 2

(c)

Mark scheme

- The standard of living of the average citizen in Louland decreased from year 1 to year 2. Real GDP per capita in year 1 was 800 and real GDP per capita in year 2 was 750 ($750 < 800$), so real output per person fell, indicating a lower standard of living.

Solution 2

(d)

Mark scheme

- The inflation rate from year 1 to year 2 was 15% (the percentage increase in the price level/GDP deflator between the two years).

Solution 2

(e)

Mark scheme

- Real wages decreased. Explanation: nominal wages increased by only 10%, which is less than the 15% inflation rate over the same period ($10\% < 15\%$), so real (inflation-adjusted) wages fell.

Question 2

2024 Set 2 ■ Q2

The table provided shows the quantity and price of food and clothing, the only two goods produced and consumed in the country of Maltrose, in year 1 and year 2. Assume that year 1 is the base year.

	Year 1 Price	Year 1 Quantity	Year 2 Price	Year 2 Quantity
Food	\$10	12	\$13	10
Clothing	\$5	16	\$4	20

Question 2

- (a) Calculate the nominal GDP in year 2. Show your work.
- (b) Calculate the GDP deflator in year 2. Show your work.
- (c) What was the numerical value of the inflation rate from year 1 to year 2?
- (d) Assuming that the expected inflation rate between years 1 and 2 was 3%, were each of the following better off, worse off, or unaffected as a result of the economic conditions between year 1 and year 2?
 - (d)(i) People living on a fixed income
 - (d)(ii) Borrowers with fixed interest-rate loans. Explain.

Solution 2

(a)

Mark scheme

- Nominal GDP_{Year2} = $(\$13 \times 10) + (\$4 \times 20) = \$130 + \$80 = \$210$. Award the point for computing price $\times$ quantity for each good in year 2 and summing to \$210.

Solution 2

(b)

Mark scheme

- $$\begin{aligned} \text{GDP Deflator}_{\text{Year}\backslash,2} &= \frac{\text{Nominal GDP}_{\text{Year}\backslash,2}}{\text{Real GDP}_{\text{Year}\backslash,2}} \times 100 = \\ &= \frac{210}{(\$10 \times 10) + (\$5 \times 20)} \times 100 = \\ &= \frac{210}{\$200} \times 100 = 105\% \end{aligned}$$

Real GDP values year-2 quantities at year-1 (base-year) prices \$10 and \$5. Award the point for the correct setup and result of 105.

Solution 2

(c)

Mark scheme

- With the GDP deflator equal to 100 in the base year (year 1) and 105 in year 2, the inflation rate from year 1 to year 2 is $\frac{105 - 100}{100} \times 100\% = 5\%$.

Solution 2

(d)

Mark scheme

- Stem only — asks whether (i) people on a fixed income and (ii) borrowers with fixed-rate loans were better off, worse off, or unaffected, given actual inflation of 5% versus an expected inflation rate of 3%. Scored in (d)(i) and (d)(ii) below.

Solution 2

(d)(i)

Mark scheme

- People living on a fixed income were worse off. Actual inflation (5%) exceeded expected inflation (3%), so the real purchasing power of their fixed nominal income fell by more than they had anticipated.

Solution 2

(d)(ii)

Mark scheme

- Borrowers with fixed interest-rate loans were better off. Explanation: because actual inflation (5%) exceeded expected inflation (3%), the real interest rate they ended up paying (nominal rate minus actual inflation) was lower than the real rate they had expected (nominal rate minus expected inflation), so the real value/burden of their fixed debt payments decreased by more than expected.

Question 2

2022 Set 1 ■ Q2

Assume that commercial banks must hold a minimum of 20% of their deposits as reserves. Now suppose that the central bank of the country sells 100,000 of government bonds to commercial banks.

- (a)** Calculate the maximum change and state the direction of change in the money supply as a result of the central bank bond sale. Show your work.
- (b)** Draw a correctly labeled graph of the money market and show the effect of the change in the money supply identified in part (a) on the nominal interest rate.
- (c)** Given the change in the money supply in part (a), if the velocity of money is constant, what will happen to the nominal gross domestic product? Explain.
- (d)** Based on the change in the nominal gross domestic product in part (c), what happens to the price level if the real gross domestic product is constant?

Solution 2

(a)

Mark scheme

- Maximum change in money supply = bond sale $\times$ money multiplier = $-\$100,000 \times (1/0.2) = -\$100,000 \times 5 = -\$500,000$ (a decrease of \$500,000). Show work: the money (deposit) multiplier = $1/\text{required reserve ratio} = 1/0.2 = 5$. 1 point for the correct answer (a decrease of \$500,000) with work shown and direction (decrease) stated.

Solution 2

(b)

Mark scheme

- Draw the money market: vertical money supply MS_1 , downward-sloping money demand MD_1 (axes: Nominal Interest Rate vertical, Quantity of Money horizontal), equilibrium at i_1 , Q_1 — 1 point. Shift MS_1 leftward to MS_2 (reflecting the decrease in the money supply from part a), producing a new equilibrium at a higher nominal interest rate i_2 ($i_2 > i_1$) and lower quantity Q_2 — 1 point. Total 2 points.

Solution 2

(c)

Mark scheme

- Nominal gross domestic product (nominal GDP = PY) will decrease.
Explanation: by the quantity theory of money, $MV = PY$; holding velocity (V) constant, a decrease in the money supply (M) causes nominal GDP (PY) to decrease proportionally. 1 point for the correct direction (decrease) with this explanation.

Solution 2

(d)

Mark scheme

- The price level decreases. Since nominal GDP (PY) decreased (from part c) and real GDP (Y) is held constant, the price level (P) must fall for the product PY to fall. 1 point for correctly stating that the price level decreases.

Question 3

2021 Set 1 ■ Q3

Flowerland is an open economy with a flexible exchange rate regime. The natural rate of unemployment is 5%, the frictional rate of unemployment is 4%, and the actual rate of unemployment is 7%.

(a) What is the numerical value of the cyclical rate of unemployment in Flowerland?

Question 3

2021 Set 1 ■ Q3

Flowerland is an open economy with a flexible exchange rate regime. The natural rate of unemployment is 5%, the frictional rate of unemployment is 4%, and the actual rate of unemployment is 7%.

(b) Assume the foreign demand for lavender oil produced in Flowerland increases.

What will happen to each of the following in Flowerland in the short run?

(b)(i) Aggregate demand. Explain.

(b)(ii) Cyclical unemployment.

Question 3

2021 Set 1 ■ Q3

Flowerland is an open economy with a flexible exchange rate regime. The natural rate of unemployment is 5%, the frictional rate of unemployment is 4%, and the actual rate of unemployment is 7%.

(c) The table shows the market basket quantities and prices of lavender oil and roses, the only two goods produced in Flowerland.

Goods	Quantity (in units)	2019 Price per Unit	2020 Price per Unit
Lavender oil	40	\$3	\$4
Roses	4	\$20	\$25

Question 3

Assume 2019 is the base year. Based on the data in the table, calculate the price index for year 2020 in Flowerland. Show your work.

Question 3

2021 Set 1 ■ Q3

Flowerland is an open economy with a flexible exchange rate regime. The natural rate of unemployment is 5%, the frictional rate of unemployment is 4%, and the actual rate of unemployment is 7%.

(d) If nominal income in Flowerland increased by 20% from 2019 to 2020, will the standard of living of the average citizen of Flowerland increase, decrease, or stay the same from 2019 to 2020? Explain.

Solution 3

(a)

Mark scheme

- The numerical value of the cyclical rate of unemployment in Flowerland is 2%.

Solution 3

(b)

Mark scheme

- This is the question stem introducing two sub-parts, (i) and (ii), about the short-run effects on Flowerland of an increase in foreign demand for lavender oil; it carries no points of its own in the scoring guidelines. The 2 points for this part are allocated entirely to 3(b)(i) and 3(b)(ii) below.

Solution 3

(b)(i)

Mark scheme

- State that aggregate demand will increase. Explain: an increase in foreign demand for lavender oil (a Flowerland export) increases net exports, a component of aggregate demand, so AD increases.

(b)(ii)

Mark scheme

- State that cyclical unemployment will decrease, as the increase in aggregate demand raises real output and employment, reducing cyclical unemployment.

Solution 3

(c)

Mark scheme

- Calculate the price index for year 2020 as 130, showing work: Price Index = $\left[\frac{\text{Value of the market basket in 2020}}{\text{Value of the market basket in 2019}} \right] \times 100 = \frac{(\$4 \times 40) + (\$25 \times 4)}{(\$3 \times 40) + (\$20 \times 4)} \times 100 = \frac{\$260}{\$200} \times 100 = 130$.

Solution 3

(d)

Mark scheme

- State that the standard of living of the average citizen of Flowerland will decrease. Explain: nominal income increased by 20% from 2019 to 2020, but this is less than the inflation rate over the same period (the price index rose from 100 to 130, i.e., 30% inflation), so real income falls, decreasing the standard of living.