Box Article

Understanding Inflation Drivers: Differentiating Common and Idiosyncratic Dynamics in Malaysia

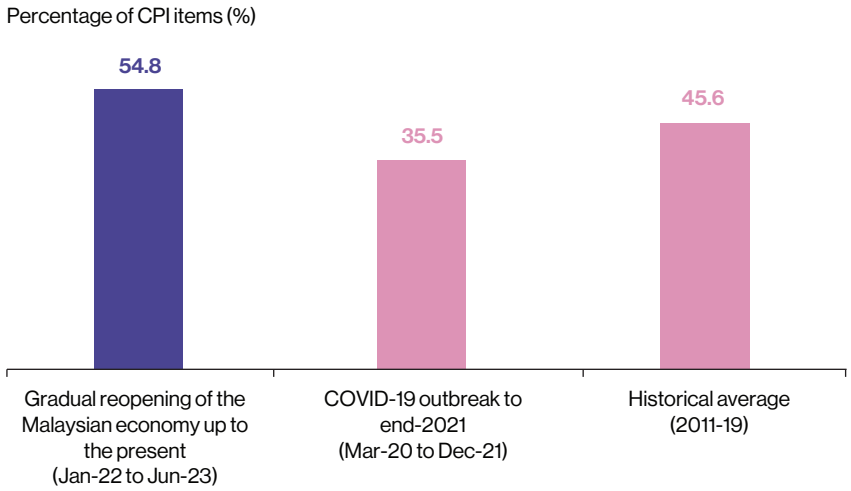
Highlights

- Common inflation disentangles general from sector-specific price changes, providing an alternative indicator of underlying inflation.
- Unlike in the past, the recent inflationary episode was mostly driven by economy-wide shocks rather than sector-specific ones, necessitating pre-emptive adjustments of monetary policy.

INTRODUCTION

Headline inflation has surged in recent times, reaching 4.7% in August 2022. While it is currently moderating, the inflationary pressures during this episode have been particularly pervasive and persistent. The extent of these broad-based price increases is evident in the average share of Consumer Price Index (CPI) items that recorded monthly price increases, which rose sharply to 54.8% from early 2022 to the present (Chart 1). Meanwhile, the persistence of inflationary pressures is evidenced by the number of months of continuous pervasive price increases[1] (Chart 2).

Chart 1: Average share of CPI items recording month-on-month price increases



Note: This is calculated based on the month-on-month inflation for 125 CPI items at the 4-digit level.

Source: Department of Statistics, Malaysia, Bank Negara Malaysia Estimates

[1] A month with pervasive price increases is defined here as a month in which the share of CPI items recording month-on-month price increases that is above the historical average (2011-2019 average).

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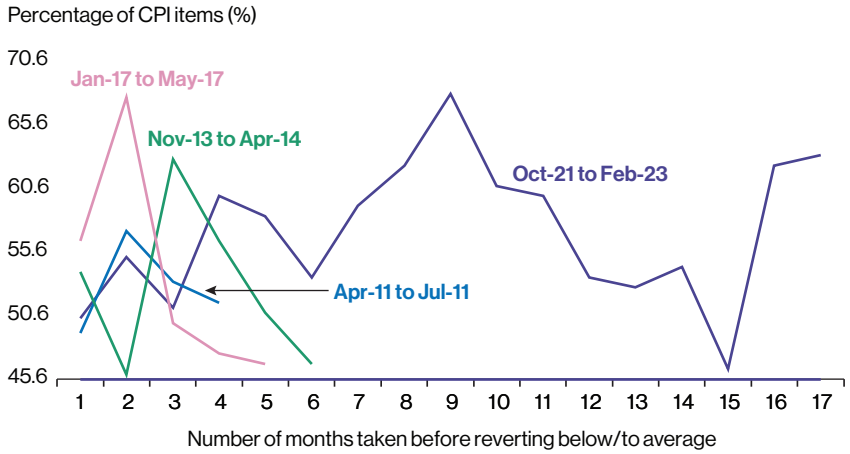
Chart 2: Episodes of consecutive above-average[1] share of CPI items recording month-on-month price increases[2]



[1] The average share of CPI items recording month-on-month price increases is 45.6% of the CPI basket, which is calculated based on monthly frequency from January 2011 to December 2019.
[2] This is calculated based on the month-on-month inflation for 125 CPI items at the 4-digit level.

Source: Department of Statistics, Malaysia, Bank Negara Malaysia Estimates

Given the multiple shocks to inflation in the past two years,[2] quantifying the extent to which inflation is driven by general or sector-specific price pressures can provide important insights on the underlying inflation in the economy. On the one hand, inflation can be influenced by sector-specific factors, which arise from unique circumstances in particular industries or segments. For example, inclement weather affecting vegetable production or timber shortages impeding furniture production can result in price adjustments in the respective sectors. The impact of these factors is usually contained within specific segments, and unless the shocks become prolonged and severe, they tend to be short-lived.

In contrast, when inflation is driven by economy-wide or common factors, inflationary pressures can become more widespread. These factors include, among others, the influence of aggregate demand conditions or changes in overall firms' price-setting behaviour, affecting general price changes in the economy.

For monetary policy, a key focus is on identifying the inflationary pressures that are driven by common factor. As a tool for managing the economy, monetary policy has a broad impact on macroeconomic factors. It may not be as effective in addressing sector-specific idiosyncrasies, which would necessitate the use of other policy tools or more targeted measures.[3]

[2] In addition to global supply disruptions and stronger domestic demand, shocks also stemmed from adverse weather conditions, the escalation of the military conflict in Ukraine, and a stronger US dollar exchange rate.
[3] For example, the vulnerability of chicken prices to movement in global grains prices, or fluctuations in fresh vegetable prices due to landslides, is not necessarily best tackled by monetary policy. Instead, implementing specific measures targeting the resilience of the supply chain in these sectors would better address the root causes of the problem.

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This article aims to assess the extent to which inflation has been influenced by economy-wide factors, providing a quantitative measure of general or "common" inflation in Malaysia. Additionally, it sheds light on the contrasting trends between recent movements in common inflation and that observed in previous periods of high inflation.

Common inflation captures the co-movement across individual CPI inflation series

Inflation can be analysed from multiple perspectives. One approach involves decomposing it based on demand and supply drivers (Shapiro, 2022), or by examining the wage intensity of disaggregated CPI items (Lane, 2023). Given the recent confluence of simultaneous and aggregate global shocks affecting inflation, there is a growing interest in disentangling general and sector-specific price changes (Luciani, 2020; Nir et al., 2021; Potjagailo et al., 2022). General price changes are influenced by common shocks that exert widespread price pressures in the same direction across the economy. In contrast, sector-specific factors lead to price changes only for specific goods and services relative to others. By disentangling these two forces, an alternative underlying inflation indicator – "common" inflation that is driven by common shocks can be derived, providing a closer reflection of price adjustments driven by aggregate macroeconomic conditions.

To quantitatively gauge common inflation, a dynamic factor model[4] is used to estimate the common component from the inflation rate of each of the 125 disaggregated CPI items at the four-digit level. Each of these series is decomposed into a common component, representing shared trends with other individual items, and an idiosyncratic component that captures fluctuations specific to those items.[5] The resulting common component of individual items is aggregated and scaled to the overall inflation rate using a simple linear regression, yielding a measure of common inflation.[6] The residual after accounting for common inflation is called the idiosyncratic component.[7] Of significance, the construction of common inflation and idiosyncratic component is entirely data-driven.[8]

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4 Following Nir et al. (2021), a dynamic factor model is used to estimate the common component based on 125 monthly ex-tax inflation series from January 1991 to June 2023.

5 The inflation of each individual item has been adjusted to exclude the direct impact of one-off changes in consumption tax policies (GST and SST) in 2015 and 2018.

6 Common inflation is defined and calculated as the predicted series obtained from a simple linear regression of the monthly ex-tax headline inflation on an intercept and the common component derived in the preceding step.

7 In view of the lack of availability of full historical CPI weights, the scaling of the common component to inflation rates closely follows the methodology documented by Statistics Canada for deriving their CPI-common (Statistics Canada, 2021).

8 "Data-driven" refers to the analysis that does not make any "structural" economic assumptions or ad-hoc adjustments when determining the factors that affect prices.

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Over time, common inflation remains stable, unlike the volatile idiosyncratic components

Historically, common inflation tends to remain stable, in contrast to the volatile and transitory nature of idiosyncratic components (Chart 3). By filtering out the influence of idiosyncratic shocks, common inflation provides a signal of underlying inflation that constitutes a significant portion of headline inflation.[9] Notably, instances of perceptible increases in common inflation typically coincided with periods of robust real economic growth and acute cost pressures, as evidenced by occurrences in 2011 and 2022. During these periods, real GDP growth was 5.3% and 8.7% respectively (2011-2019 average: 5.1%), with significant cost factor adjustments given the upcycle in global commodity prices (2011: 24.6%; 2022: 29.7%; 2011-2019: -1.0%) and ringgit depreciation in 2022. This observation reflects the close relationship between common inflation and economy-wide factors, with the sensitivity of common inflation particularly pronounced in response to aggregate demand conditions.

As an open economy, however, Malaysia is susceptible to short-term fluctuations in global cost factors which often resulted in idiosyncratic price adjustments. For instance, from late 2014, headline inflation[10] declined substantially while common inflation rose slightly. This can be attributed to the sharp decline in global oil price that led to sector-specific price adjustments without significantly propagating to broader consumer prices. From 2016 to 2020, common inflation experienced a gradual decline, although headline inflation continued to fluctuate due to swings in the idiosyncratic component. While some idiosyncratic movements can be traced back to specific events, such as the 2015 global oil price decline, not all of them can be precisely attributed to a particular occurrence. As such, the data-driven approach is helpful in identifying such movements.

[9] These are also in line with findings in other countries, such as those for the UK in Potjagailo et al. (2022).

[10] Headline inflation has been adjusted to exclude the direct impact of consumption tax policy changes, which is the GST in 2015.

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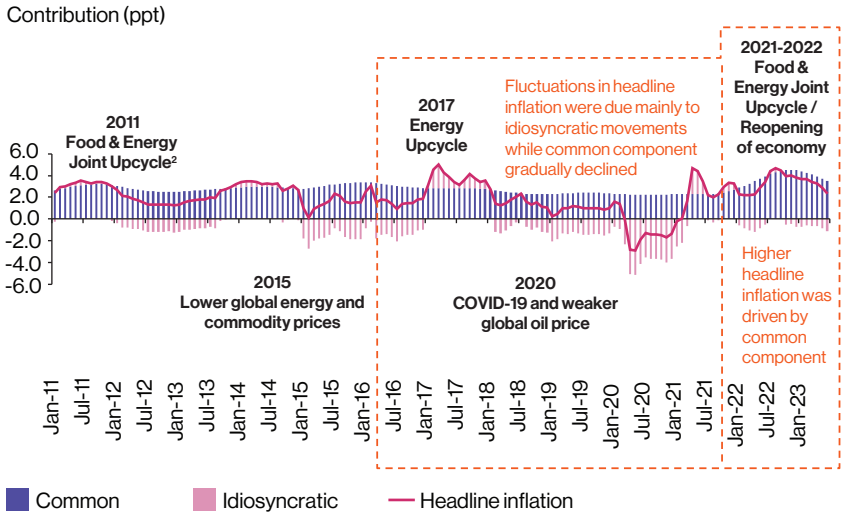
Chart 3: Decomposition of headline inflation[1] by common and idiosyncratic factors



[1] Headline inflation is adjusted to exclude the direct impact of consumption tax policies changes (GST and SST) in 2015 and 2018.

[2] Upcycle refers to periods when global food and/or energy commodities exhibited year-on-year movements higher than the standard deviation. Global food and energy commodities data are from World Bank Commodity Price Data (The Pink Sheet).

Source: Department of Statistics, Malaysia, Bank Negara Malaysia Estimates

Common inflation has risen significantly in 2022, before moderating

Unlike in the past, the rise in headline inflation since the start of the recovery from the COVID-19 pandemic was predominantly driven by common inflation. Initially, the increase in headline inflation was mainly driven by global cost factors[11] that directly impacted specific segments of domestic consumer prices, such as flour and other cereal grains.[12] However, over time, their effects spilt over to a broader range of consumer prices, leading to a rapid increase in common inflation in 2022. This widespread propagation of price pressures also coincided with the rebound in domestic demand[13] as the country transitioned to endemicity and fully relaxed containment measures. Industrial engagements[14] conducted by the Bank also indicated a possible change in firms' price-setting behaviour in response to the combination of high inflation and robust demand conditions. This shift enabled larger firms, in particular, to raise prices more easily, which further contributed to the increase in common inflation.

[11] Global energy and non-energy commodity prices surged to historical highs in early 2022 with the unfolding of the military conflict in Ukraine.

[12] Flour and other cereal grains, as well as products made from cereal grains, recorded a month-on-month increase of 2.8% (compared to the 2011-2019 average of 0%) and 1.1% (compared to the 2011-2019 average of 0.1%) in the second quarter of 2022, respectively.

[13] Among other demand indicators, the real private consumption growth rate was recorded at 11.2% in 2022 (compared to the 2011-2019 average of 7.1%). Furthermore, in terms of high-frequency data, the online retail trade growth rate reached 19.8% in 2022 (compared to 13.8% in 2019).

[14] Industrial engagements by the Bank here comprised in-depth interviews with key decision-makers from firms of micro, small, medium, and large sizes from 17 to 24 May 2023.

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More recently, the decomposition of headline inflation also revealed that the ongoing disinflationary trend since early 2023 has been contributed by both common and idiosyncratic components. Of note, the disinflation would have been slower in the absence of the idiosyncratic component, which contributed negatively to the overall CPI inflation at the current juncture.

At the disaggregated level, certain CPI items are more susceptible to the common component

Overall, the degree to which economy-wide factors influence price adjustments of each disaggregated CPI item varies (Table 1). It is observed that service inflation tends to be more significantly influenced by the common component.[15] Given that services are less tradable, it tends to more closely mirror local activities that are more influenced by the aggregate domestic economic environment. In comparison, goods inflation tends to be more susceptible to global trade dynamics and related exposures to short-term fluctuations and disruptions in sector-specific supply chains. Specifically, about 62% of the variation in services inflation since 2011 can be attributed to the common component, whereas the common component explains only 14% of the variation in goods inflation. Delving deeper into the disaggregated level, specific services that are highly influenced by the common component include repair and maintenance of personal transport, expenditure in restaurants and café, repair of household appliances, accommodation services, and food away from home. A potential explanation for the significant influence of the common component on these items is their discretionary nature, which may be more synchronous with economic strength.

[15] This finding is consistent with Potjagailo et al. (2022), Luciani (2020), and Khan et al. (2013), which highlight the greater significance of common dynamics in services inflation.

Table 1: Common dynamics in disaggregated CPI inflation

Items	CPI 2018 weight (%)	Share of variance explained by common component (%)
Goods inflation	49.2	13.9
Services inflation	50.8	62.3
Services: Top 5 share of variance explained by common component		
Repair and maintenance of personal transport	2.1	82.3
Expenditure in restaurant cafe	2.4	68.4
Repair of household appliances	0.1	58.1
Accommodation services	0.6	51.5
Food away from home	11.5	48.0

Note: The share of variance explained by the common component is based on the R-squared obtained from a regression of each 4-digit level component's inflation rate on the common component of CPI over the period of January 2011 to June 2023.

Source: Department of Statistics, Malaysia, Bank Negara Malaysia Estimates

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Conclusion and policy considerations

Common inflation captures the broad price movements influenced by macroeconomic conditions, such as the strength of the economy or generalised cost shocks, while mitigating the impact of sector-specific disturbances. This facilitates the extraction of a signal from the overall CPI inflation, which would be useful for monetary policy that aims at influencing the entire economy rather than specific segments. As such, common inflation can complement the existing measures of underlying inflation monitored by the Bank, in addition to the official underlying inflation measure – the core inflation, which is published by the Department of Statistics, Malaysia.[16]

It is observed that the recent increase in headline inflation following the recovery from the COVID-19 pandemic differs considerably from past episodes of high inflation. This time, the inflation surge was primarily contributed by the common component which necessitated pre-emptive adjustments in monetary policy to rein in excessive demand that could stoke further inflationary pressures. This contrasted with historical instances where fluctuations in headline inflation were mainly driven by idiosyncratic shocks, which tend to be short-lived and did not warrant monetary policy response.

However, vigilance is warranted to guard against potential future sector-specific shocks. Given the interconnected nature of various consumer products, there remains a risk of idiosyncratic price shocks morphing into sustained general price pressures if they persist, intensify, or induce widespread behavioural changes.[17] Considering that the role of monetary policy is to contain the propagation of broad-based inflationary pressures and manage inflation expectations, adjustments to monetary policy need to pre-emptively address potential inflation risks, including salient price increases originating from idiosyncratic shocks. This can avoid the need for more forceful measures down the road, which could result in a much higher cost to the economy, particularly if upside risks to inflation materialise. To identify when such a transition to general price pressures may occur, a combination of analysis into common inflation and surveillance insights can be employed. This ensures a comprehensive analysis of inflation dynamics for monetary policy consideration.

[16] While common and core inflation typically exhibits a strong correlation, they differ in terms of definition and construction methodology. Common inflation seeks to capture the synchronised movements across the entire CPI basket, driven by economy-wide influences using a statistical model. Conversely, core inflation is defined by excluding volatile and administered price items in its construction. However, even after removing these items, core inflation remains susceptible to sector-specific fluctuations.

[17] Amid significant inflationary pressures, such as those experienced in the second half of 2022, common inflation estimates can be subject to unusually large revisions (Sullivan, 2022). This is not surprising, as these estimates are based on models that rely on unobserved variables, and historical estimates may change as new observations become available, leading to a re-estimation of the dynamic factor model.

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