

Changing Dynamics of Core Inflation in ASEAN+3¹

February 28, 2024

“The global economy seems to be on the cusp of a historic change as many of the aggregate supply tailwinds that have kept a lid on inflation look set to turn into headwinds.”

- Agustin Carstens²
Bank for International Settlements
August 2022

Introduction

- Since 2021, inflation in ASEAN+3 economies surged to multi-year highs and despite the moderation in the more recent period, remained elevated.** Global and regional inflation faced multiple supply shocks, including pandemic-related demand shifts from services to goods, global supply chain disruptions, and labor supply shortages. Inflation was consequently expected to be transitory and moderate when these disruptions and shortages ease as economies reopen after the pandemic. The post-pandemic reopening also led to demand recovery which placed some upward pressure on inflation. Today, inflation remains above long-term average for most economies despite lower global commodity prices and policy interest rates having returned or even exceeded pre-pandemic levels for most economies.
- Given the intricacies of the multiple overlapping factors affecting inflation, understanding the primary drivers of core inflation is a starting point.** Core inflation excludes price-volatile items which typically co-move with global commodity prices. While it is historically more stable than headline inflation, core inflation has risen at a similar pace over the last three years and persisted at elevated levels for longer. This study uses the official core inflation statistics from each regional economy, which have varying definitions but commonly aim to filter out volatile and transient price changes (Table 1). The official core inflation metric should therefore more accurately reflect country-specific general price changes and thus the underlying inflation trends. Analyzing the dynamics of core inflation could offer some insights into the broader complexity of achieving price stability amid shifting inflationary forces.

¹ Prepared by Catharine Kho (catharine.kho@amro-asia.org) and Megan Wen Xi Chong (megan.chong@amro-asia.org), both Regional Surveillance, and Heung Chun (Andrew) Tsang (andrew.tsang@amro-asia.org) from Country Surveillance; reviewed by Allen Ng, Group Head, Regional Surveillance and Runchana Pongsaparn, Group Head, Country Surveillance; authorized by Hoe Ee Khor, Chief Economist. The authors would like to thank Kouqing Li and Yoki Okawa for useful comments. The views expressed in this note are the authors' and do not necessarily represent those of the AMRO or AMRO management. Unless otherwise indicated, the analysis is based on information available up to January 2024. For brevity, Brunei Darussalam is referred to as Brunei and Hong Kong, China is referred to as Hong Kong in this note.

² From his speech at the Jackson Hole Economic Symposium 2022: <https://www.bis.org/speeches/sp220826.pdf>

Table 1. Official Definitions of Core Inflation

Economy	Excludes food and energy items only	Others
China	✓	
Hong Kong	✓	
Japan	✓	Excludes fresh food and energy.
Korea	✓	
Brunei	–	–
Cambodia	✓	Releases three measures of core inflation: <ul style="list-style-type: none"> - Excludes food and non-alcoholic beverages - Excludes oil related - Excludes food and non-alcoholic beverages and oil related
Indonesia	✓	Excludes food items with volatile prices and goods with administered prices.
Lao PDR	✓	
Malaysia	✓	Excludes food items with volatile prices and goods with administered prices.
Myanmar	✓	
The Philippines	✓	Excludes selected food and energy.
Singapore	-	Excludes private transport and accommodation costs.
Thailand	✓	Excludes fresh food and energy.
Vietnam	✓	Excludes food items, energy products and commodities under State management including medical and educational services.

Source: National authorities

Note: Grey ticks refer to economies that exclude a variation of food or energy products to form its core inflation measure. Core inflation for Japan refers to “core-core” inflation, which excludes fresh food and energy.

3. This Analytical Note aims to disentangle the supply and demand factors underpinning the dynamics of core inflation in the region in the recent period. It begins by comparing the ASEAN+3 experience against the other major economies. Section II discusses stylized facts contrasting post-pandemic core inflation trends with the pre-pandemic period. Section III disaggregates core inflation into supply and demand drivers. Section IV concludes with policy considerations and suggestions for future research.

II. Developments on Inflation in ASEAN+3: Stylized Facts

4. Headline inflation in ASEAN+3 rose at a slower pace and peaked at a lower level than major economies outside the region. Since declining to its lowest level in May 2020— at the height of the COVID-19 pandemic—headline inflation in the US, euro area, OECD³ and ASEAN+3⁴ rose steadily. Headline inflation reached a peak of 9.1 percent in the US and 5.2 percent in ASEAN+3 in June 2022 and September 2022, respectively. The headline inflation in OECD and euro area peaked in October 2022, at higher rates of 9.9 percent and 10.6 percent, respectively (Figure 1). Headline inflation across all regions has moderated since then mainly as the result of moderating global commodity prices and easing global supply chain bottlenecks, but remained higher than before the pandemic at the time of drafting.

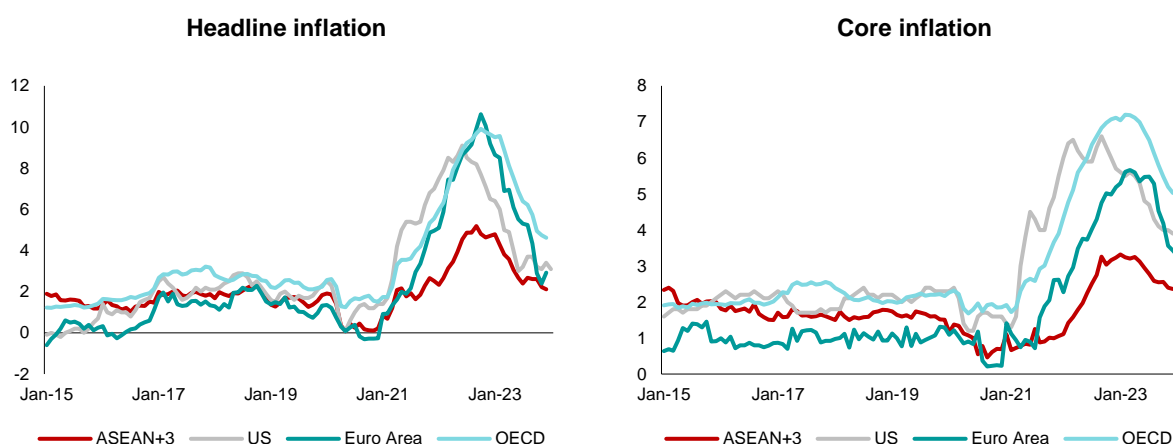
5. Headline inflation in 2021-2023 rose rapidly due to both supply and demand factors. In early 2021, global prices rose due to supply bottlenecks which occurred as goods

³ OECD throughout this Analytical Note refers to OECD economies excluding United States and economies in the euro area and ASEAN+3 to avoid double counting. Turkiye is also excluded to avoid skewing the regional data due to the idiosyncratic sharp depreciation of the Turkish lira, which led to headline inflation in the country more than tripling from 19 percent in 2021 to 72 percent in 2022, with a peak of 85.5 percent in October 2022.

⁴ ASEAN+3 throughout this Analytical Note refers to Plus-3 and ASEAN-5 economies. Brunei, Cambodia, Lao PDR, Myanmar, and Vietnam are excluded due to lack of timely and comparable data.

demand surged at the same time as manufacturing activities in major production areas were halted as part of COVID-19 containment measures. The ensuing global supply chain disruptions were wide-ranging and broadly lasted throughout the year. Global supply chains were disrupted once again in early 2022 following the onset of the Russia-Ukraine crisis. Concurrent demand recovery as economies reopened after the COVID-19 lockdown exerted additional upward pressure on inflation. Notwithstanding these global forces, the slower pace of increase and lower peak in ASEAN+3 inflation likely reflects the lower pass-through of higher global commodity prices (Kho and others, 2021). The impact of global commodity prices on individual economies would differ given the different degree of reliance on commodities for the regional economies, and the use of subsidies in many of these economies to contain the increase in energy and food prices (Kho and Zhao, 2022).

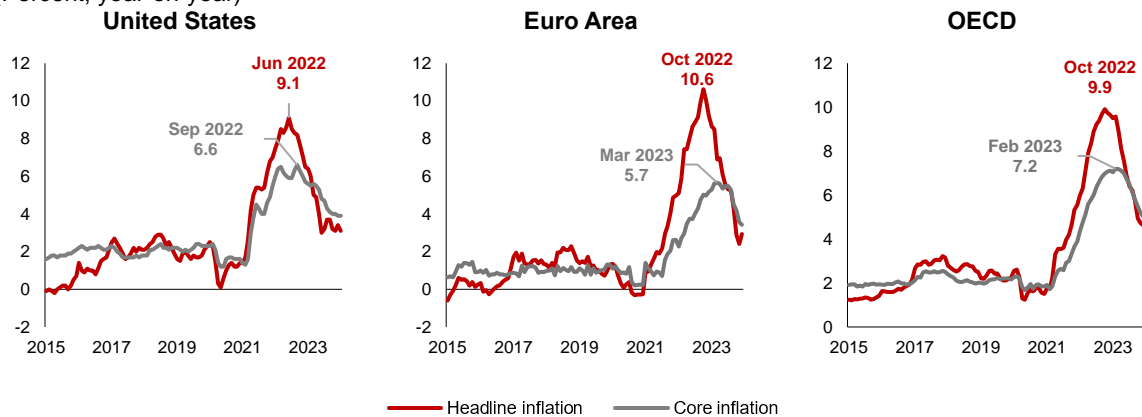
Figure 1. US, euro area, OECD and ASEAN+3: Headline and Core Inflation
(Percent, year-on-year)



Source: National authorities via Haver Analytics; AMRO staff calculations.
Note: ASEAN+3 includes China, Hong Kong, Japan, Korea, Indonesia, Malaysia, the Philippines, Singapore, and Thailand. OECD here refers to OECD economies excluding United States and economies in the euro area and ASEAN+3 to avoid double counting. Türkiye is also excluded to avoid skewing the regional data due to the idiosyncratic sharp depreciation of the Turkish lira.

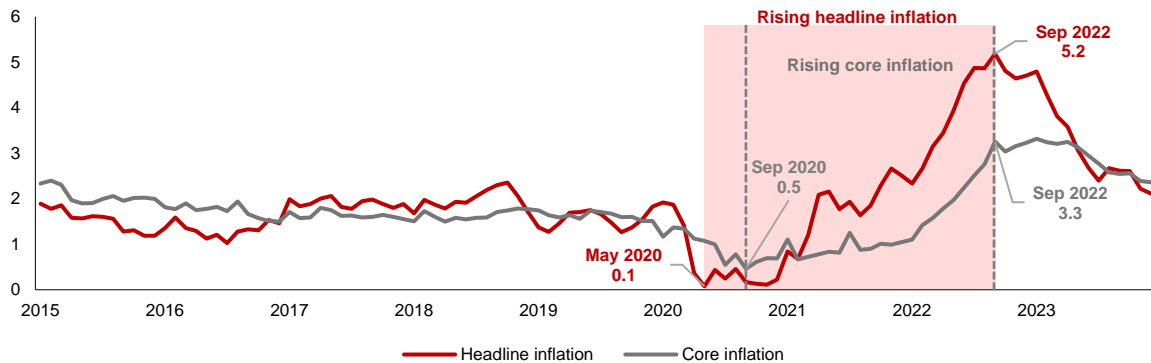
6. Similar to the US, euro area and OECD, disinflation in core inflation in ASEAN+3 is slower than headline inflation. In the US and euro area, core inflation reached its lowest level in recent period in May 2020 and September 2020 respectively—the same month as headline inflation. Core inflation subsequently rose in tandem with headline inflation but peaked at a later period compared to headline inflation—core inflation peaked 3 months later than headline inflation for the US in Sept 2022, 4 months later for OECD and 5 months later for the euro area in March 2023 (Figure 2). This trend differs for ASEAN+3 which saw core inflation reaching its lowest level in September 2020, 4 months later than headline inflation, but rising to its peak at the same time as headline inflation in September 2022 (Figure 3). Since their respective peaks, core inflation has moderated at a slower pace than headline inflation. The pace of disinflation differs across economies. In China, Japan and the Philippines, the slower pace of disinflation in core inflation vis-à-vis headline inflation is more pronounced, with core inflation outpacing headline inflation for 9 to 10 months out of the last 10 months in 2023 (Figure 4; See Appendix I for headline and core inflation trends for individual ASEAN+3 economies).

Figure 2. United States, Euro Area, and OECD: Headline and Core Inflation
(Percent, year-on-year)



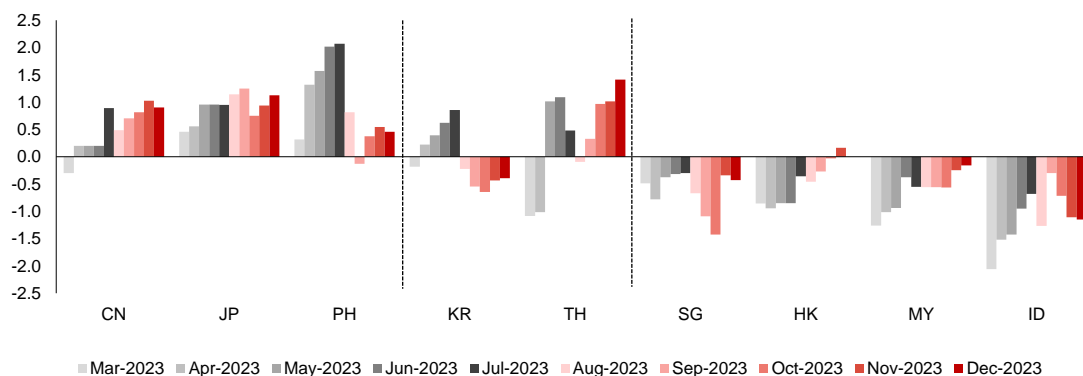
Source: National authorities and OECD via Haver Analytics; AMRO staff calculations.
Note: OECD here refers to OECD economies excluding United States and economies in the euro area and ASEAN+3 to avoid double counting. Turkiye is also excluded to avoid skewing the regional data due to the idiosyncratic sharp depreciation of the Turkish lira.

Figure 3. Selected ASEAN+3: Headline and Core Inflation
(Percent, year-on-year)



Source: National authorities via Haver Analytics; AMRO staff calculations.
Note: Selected ASEAN+3 includes China, Hong Kong, Japan, Korea, Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

Figure 4. Selected ASEAN+3: Difference between Core Inflation and Headline Inflation
(Percentage point, year-on-year)

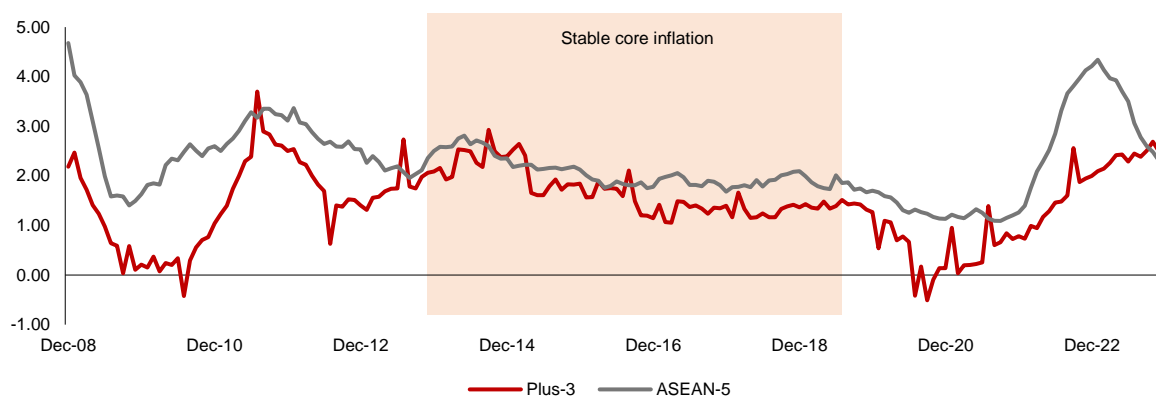


Source: National authorities via Haver Analytics; AMRO staff calculations.
Note: Difference refers to core inflation minus headline inflation.

7. Core inflation in the region now fluctuates within a greater range than before. Core inflation is typically expected to exhibit a stable trend as price volatile items are excluded from its calculation. This trend is evident in both Plus-3 and ASEAN-5 economies in 2013 - 2019 (Figure 5). Specifically, core inflation across advanced economies and ASEAN+3 prior to the

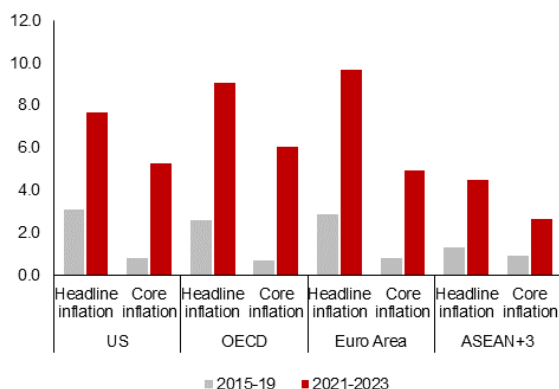
pandemic has fluctuated within a band of less than 1 percentage point (Figure 6). However, in the last 2 years, the range for core inflation has increased six-fold for advanced economies and tripled for ASEAN+3. The lower increase in ASEAN+3 reflects the narrowing of core inflation range in Malaysia, Indonesia, Hong Kong, and Korea, which partially offset the wider ranges seen in the remaining regional economies (Figure 7).

Figure 5. ASEAN+3: Core Inflation
(Percent year-on-year)



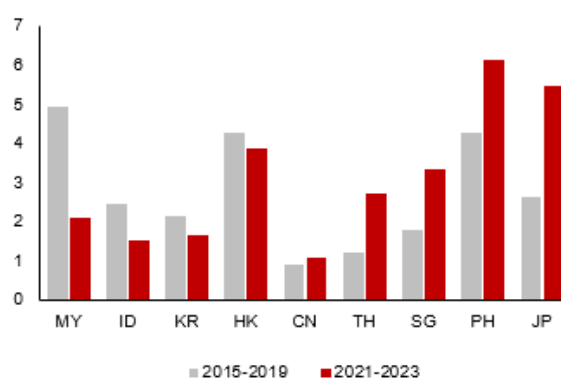
Source: National authorities via Haver Analytics; AMRO staff calculations.

Figure 6. US, OECD, euro area and ASEAN+3: Range of Core Inflation
(Percentage point)



Source: National authorities via Haver Analytics; AMRO staff calculations.
Note: Range measures the difference between the maximum and minimum values observed during the specified period.

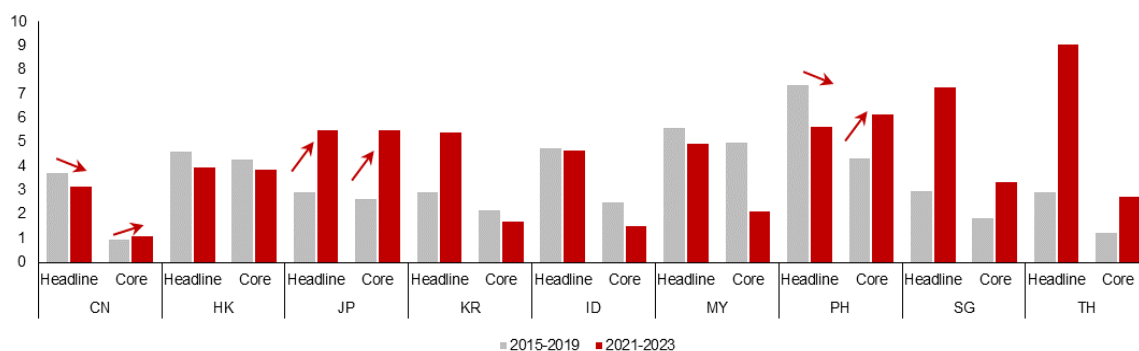
Figure 7. ASEAN+3: Range of Core Inflation
(Percent, year-on-year)



Source: National authorities via Haver Analytics; AMRO staff calculations.

8. The increase in core inflation range has exceeded the increase in headline inflation range for some regional economies. The trough-to-peak range of core inflation for advanced economies is now about two-thirds that of headline inflation compared to about a quarter previously, and 51 percent compared to 28 percent previously for ASEAN+3. Within ASEAN+3, the larger increase in core inflation range compared to headline inflation is observed in China, Japan, and the Philippines. For China and the Philippines, the wider variability of core inflation is observed when the range of headline inflation has in fact declined (Figure 8).

Figure 8. ASEAN+3: Range of Headline Inflation and Core Inflation
(Percentage point)



Source: National authorities via Haver Analytics; AMRO staff calculations.

The stylized facts above highlighted the changing nature of core inflation dynamics, and the drivers of which will be accounted for in the next section⁵.

III. Demand or Supply Factors

9. **Identifying the drivers of core inflation is essential to better understand the underlying changes to inflation dynamics which is critical for appropriate policy calibration.** Conventional demand management approach suggests that monetary and fiscal policies interventions should be limited during periods of supply shocks. Supply-side policies, such as price subsidies and administrative measures could then be deployed to cushion the impact of price increases on vulnerable households and firms. Identifying whether inflation is mainly supply or demand driven is thus essential and the focus of this analysis. On a separate note, domestic price changes could also be seen from the perspective of decisions of firms, households, or the government. Firms could increase profits by increasing prices of goods during periods of high demand or tight supply. Inflation could also reflect employees bidding up wages in a tight labor markets or governments increasing its taxes or reducing subsidies (see Appendix II for the assessment using this approach).

10. **Demand and supply factors driving core inflation in the region are decomposed using the Federal Reserve (Fed)’s framework in Shapiro (2022).** The decomposition is obtained by classifying core inflation subcomponents into demand- and supply-driven factors. The subcomponents with the same driving forces are then aggregated by multiplying the CPI weights by the year-on-year inflation of the corresponding subcomponents. The demand- and supply-driven classification is made based on the results of the following equation:

⁵ It is important to highlight the current episode of swing core inflation in the region is still ongoing and the dynamics might continue to evolve going forward. In addition, it is also interesting to note, thus far, compared to previous episodes of increases in core inflation, the duration of the current episode has also been somewhat unique but differently so between the Plus-3 and ASEAN-5 economies. For the Plus-3, the current upturn in core inflation since a trough of -0.5 percent in September 2020 has been particularly prolonged, having persisted for 37 months (Figure 5). Compared to the past episode of rising core inflation, the current magnitude of increase is lower at 3.1 percentage points as of October 2023, compared to a 4.1 percentage point increase over 26 months from July 2012 to September 2014. In contrast, core inflation in ASEAN-5 has risen and declined by a larger magnitude within a shorter period than before. Core inflation in the ASEAN-5 region has risen by 3.3 percentage points in September 2021 to January 2023 (16 months), compared to only 2.0 percentage points from November 2009 to January 2012 (27 months). The disinflation since then has reversed the increase by 1.9 percentage points within 9 months, in contrast to a 1.4 percentage point decrease over 19 months from February 2012 to August 2013.

$$\Delta \ln (P_{it}) = c + \sum_{j=1}^{12} \beta_j \Delta \ln (FP_{t-j}) + \beta_{13} OutputGap_{t-1} + \beta_{14} \Delta \ln (P_{it-1}) + \varepsilon_{it}$$

(Equation A1.1)

where P_{it} is the monthly price index for sub-category i of the CPI at time t , FP is foreign prices, represented by the IMF's International Commodity Price Index (the IMF's International Food Price Index is applied to food sub-categories) denominated in local currency at lag j , $OutputGap$ is defined as $(Actual\ GDP - Potential\ GDP)/Potential\ GDP$, in which the Potential GDP is estimated by applying the Hodrick-Prescott (HP) filter to quarterly GDP, and the quarterly output gap series is converted into monthly series using quadratic interpolation. All series are seasonally adjusted, and the sample period is from January 2010 to September 2023, subject to data availability.

11. Inflation subcomponents that are driven by supply and demand factors are classified based on the signs of the price and quantity equations for each subcomponent in the CPI basket. According to Shapiro (2022), demand shocks move prices and quantities in the same direction along the upward-sloping supply curve, while supply shocks move prices and quantities in opposite directions along the downward-sloping demand curve. As the data on quantities of goods transacted are not available, the output gap is used as a proxy in Equation A1.1, and the drivers of inflation are assigned as follows:

- **Supply-driven inflation components:** Sum of the coefficients of all lagged foreign prices is positive and has a p-value of Wald F-statistics < 0.2 ; and/or negative sign for output gap. Aggregating the sum of the coefficients ensures that the overall coefficient of foreign prices is positive and statistically significant i.e. the positive sign for foreign prices in equation A1.1. is not skewed by a statistical anomaly.
- **Demand-driven inflation components:** All components are not driven by foreign prices and have a positive sign for output gap.

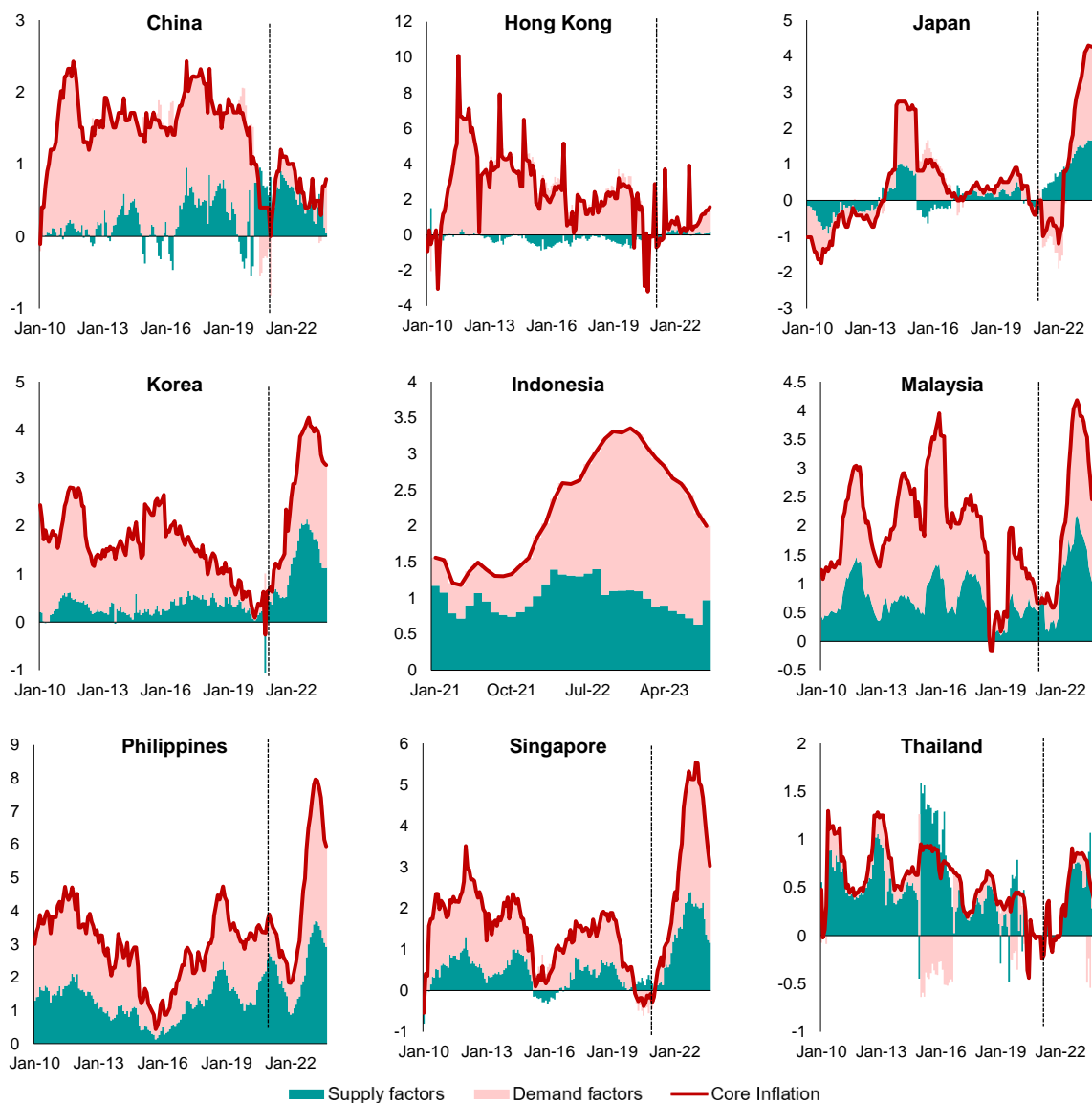
12. Domestic demand was the main driver of core inflation for the region both before and after the pandemic for most countries⁶. This is especially so in the period before the pandemic. From 2010 to 2019, demand factors underpinned the core inflation dynamics in China, Hong Kong, Korea, and Singapore (Figure 9). In Japan, Malaysia, and the Philippines, core inflation was driven by both demand and supply factors, with demand factors being slightly more prevalent. On the other hand, supply factors dominated the core inflation dynamics in Thailand. Core inflation in Thailand mainly reflected the depreciation of the Thai baht in 2010–2014, followed by the fluctuation in international commodity prices thereafter.

13. In 2021-2022, the role of supply factors in driving core inflation in the ASEAN+3 region has increased in line with the prevalence of supply shocks. Supply factors, instead of demand factors, have become the main driver of the core inflation in China, Malaysia, and the Philippines (Figure 10). Supply factors have also become more important in other regional economies. The main supply factor that contributed to the increase in core inflation in 2021–2022 is the broad-based increase in input prices due to global supply chain disruptions and the spike in global commodity prices caused by the pandemic and geopolitical tensions, respectively. Meanwhile, domestic supply constraints played a role in cost-push inflation in some economies. Domestic prices also faced upward pressures from the depreciation of

⁶ Given data limitations, we were unable to assess the inflation drivers for Indonesia before 2021.

regional currencies against the US dollar, particularly in the second half of 2022.⁷ The concurrent surge in demand as economies reopened during this period further propped up core inflation.

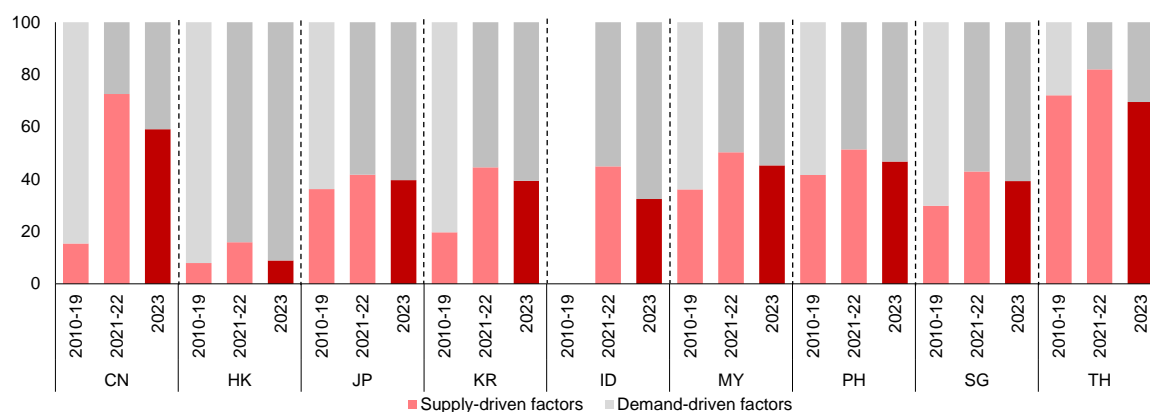
Figure 9. Drivers of Core Inflation
(Percentage points, year-on-year)



Source: National authorities via Haver Analytics; AMRO staff calculations.
Note: Vertical line denotes Jan 2021 to facilitate reference.

⁷ The impact of exchange rate on inflation could be understated, particularly for small and open economies in the region. As these economies are international price-takers, a weaker exchange rate would increase input cost in local currency and could lead to higher domestic prices.

Figure 10. Selected ASEAN+3: Average Contribution to Core Inflation
(Percent share)



Source: National authorities via Haver Analytics; AMRO staff calculations.

14. **In 2023, supply pressures subsided—albeit remaining significant—as global commodity prices stabilized, while the strong economic recovery has provided a demand surge to support the sticky core inflation.** The moderation in global commodity prices saw diminishing contribution of supply-factors, resulting in relatively faster normalization of core inflation for some regional economies, such as Indonesia, Malaysia and Thailand. For the region as a whole, 2023 saw an increase in the contribution of demand-side factors to core inflation dynamics as economic recovery gathered strength. Among the Plus-3 and ASEAN-5 economies, supply factors remain the primary driver of core inflation for only Thailand and China. Thailand has a large auto sector which has been significantly affected by high input prices for motor vehicles due to global supply shortage of microchips (Celasun and others 2022), while demand pressures were muted as economic activity remains sluggish. Similarly, core inflation in China was supported by elevated commodity prices amid slower growth in the domestic economy which is weighed down by the weakness in real estate sector. On the other hand, demand is the key driver of core inflation for the rest of the regional economies. Core inflation was driven mainly by strong economic growth, which benefitted from higher exports (Indonesia, Korea), strong domestic consumption recovery (Hong Kong, Japan, Malaysia, the Philippines, Singapore), and a rebound in tourism (Hong Kong, Indonesia, Japan, Korea) due to the complete reopening of the economies.

IV. Conclusion

15. **Supply factors have emerged as a relatively more important driver of ASEAN+3 inflation than previously, a role that is expected to persist amid global shifts.** Currently, demand factors continue to underpin core inflation for most regional economies—as evidenced by the continued elevated levels of core inflation amid moderating global commodity prices and the normalization of global supply chains. The conventional demand management approach to inflation assumes that inflation would respond flexibly to changing demand. However, core inflation has remained elevated in the past 2 years despite rising interest rates, suggesting potential limits of conventional demand-focused interventions.

16. **Looking ahead, supply factors are expected to become more frequent and persistent,⁸ which may call for a greater role of supply-side management.** Ongoing

⁸ Carstens (2022)

global value chain reconfiguration could lead to lower efficiency and higher cost of production of goods and services, resulting in higher inflation. Diminishing demographic dividends would dampen labor productivity and increase labor cost. At the same time, the transition period towards a green economy risks higher cost of clean energy, while climate change induced adverse weather conditions could stoke food prices globally.

17. Nonetheless, monetary policy will continue to play a crucial role in maintaining price stability by adjusting aggregate demand in response to permanent shifts in supply and anchoring inflation expectations. The increased frequency of supply shocks in the past few years has made it challenging to quickly determine whether a shock is demand- or supply-driven and whether it is transitory or permanent . In the case of a permanent supply shock, a corresponding monetary policy response may be necessary to realign aggregate demand with the reduced aggregate supply. A responsive and proactive monetary policy also helps ensure that inflation expectations remain well-anchored despite the occurrence of persistent and frequent shocks (Powell 2023).

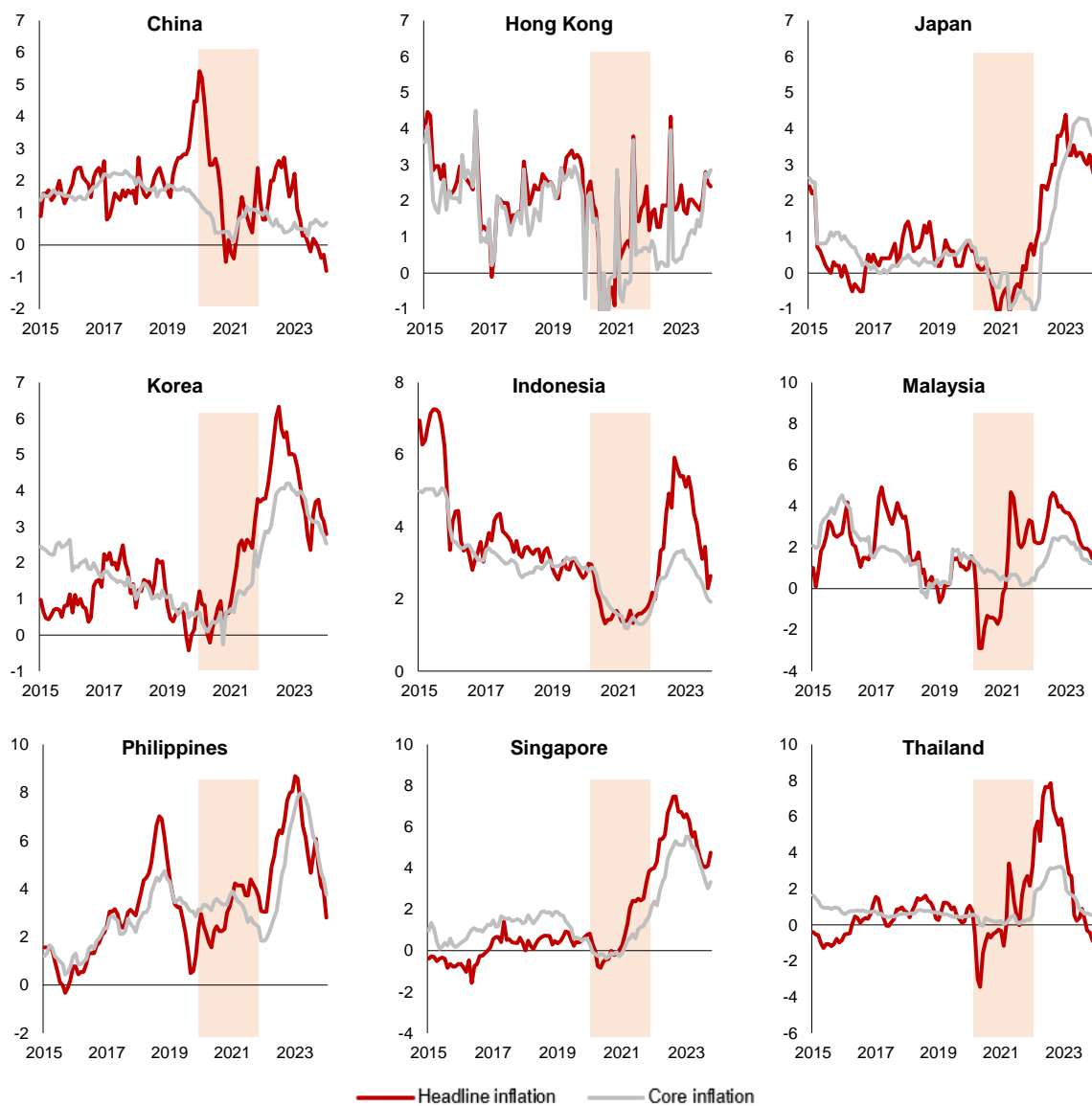
18. In some circumstances, supply-side policy responses could be more effective in addressing supply-driven inflation. For example, if inflation was driven by domestic supply shocks and production constraints, the relaxation of import restrictions, such as lowering import tariffs, would allow more imports of goods that are in shortage. Meanwhile, for international price-driven inflation, temporary price subsidies could reduce the immediate and direct inflationary pressure. Targeted subsidies could also be extended to vulnerable households and firms to mitigate the adverse impacts of the higher prices. Beyond the near-term, structural policies to enhance local production capacity and strengthen domestic supply chains should be introduced to reduce the impact of international commodity price fluctuations on domestic prices.

19. Policy coordination would be key to ensuring that measures to stimulate domestic demand do not fuel inflation further. The weakening growth momentum across the region has reignited considerations for policy support—ranging from monetary policy easing to fiscal stimulus. Monetary policy easing in an environment of high core inflation could reduce the effectiveness of monetary policy over time as inflation expectations become unanchored and repricing signals are distorted. On the other hand, while fiscal stimulus would increase local demand for goods and services, it risks leading to higher inflation if the economy is operating at full potential. Broad-based increase in prices could also lead to higher wages and labor costs as companies compete for workers to ease the domestic supply constraint.

20. In conclusion, disentangling supply and demand drivers of core inflation is one part of a complex inflation dynamics puzzle that requires further examination. A potential area to extend this study is to analyze the persistence and transmission of these supply and demand shocks across the different ASEAN+3 economies as well as the interactions between the core and headline inflation. The differentiation across countries in terms of price setting behaviors, consumer price components, exchange rate passthrough, and policy tools and policy responses within ASEAN+3 economies, would also offer deeper insights into the varying challenges each economy faces in managing inflation in this new environment.

Appendix I. Time Series of Headline and Core Inflation by Economy

Appendix Figure 1. Selected ASEAN+3: Headline and Official Core Inflation
(Percent, year-on-year)



Source: National authorities via Haver Analytics; AMRO staff calculations.

Note: Shaded areas refer to the pandemic years of 2020 and 2021.

Appendix II. Alternative Approach to Assess Drivers of Inflation: Decomposition of the GDP Deflator

The GDP deflator offers an alternative measure of the contribution to changes in domestic prices pressures. The income approach to GDP defines GDP as the sum of gross operating surplus, compensation of employees, and taxes on production and imports.

$$GDP = Profits + Compensation\ of\ Employees + Net\ Taxes$$

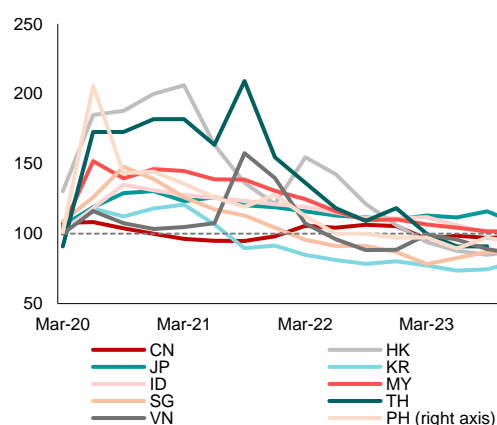
As the GDP deflator is defined as nominal GDP divided by real GDP, it can thus be expressed as the sum of unit labor costs, unit profits, and unit net taxes.

$$\frac{GDP}{GDP^R} = GDP\ Deflator = Unit\ Profits + Unit\ Labor\ Cost + Unit\ Taxes$$

Consequently, decomposing the GDP deflator allows us to determine the extent to which unit profits, labor cost or taxes drove recent price changes (Hansen, Toscani, and Zhou, 2023). Unit profits pass through to domestic prices when firms increase selling prices for goods and services to offset increases in production costs or to cater to an increase in demand. The robust recovery in demand post-COVID-19 economic reopening and higher production costs due to global supply chain bottlenecks and high commodity prices, likely led to firms increasing the prices of goods and services in the past two years.

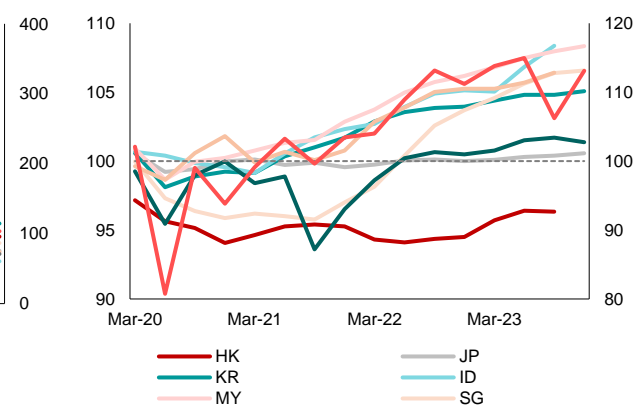
In an environment of high inflation, a wage-price spiral could occur. Unit labor cost drives inflation when employees demand higher wages in view of increased cost of living. Wages could also increase when firms raise wages and offer more attractive compensation packages to attract employees in a tight labor market. In the case of ASEAN+3 economies, labor market conditions have broadly improved since economies reopened post-pandemic, leading to falling unemployment rates, rising employment, and tight labor markets (Appendix Figure 2.1, Appendix Figure 2.2). Excluding Japan, Indonesia, and Malaysia, unemployment rates in the rest of ASEAN+3 have fallen to below pre-pandemic levels.

Appendix Figure 2.1. Selected ASEAN+3: Unemployment Rate
(Index, Q4 2019 = 100)



Source: National authorities via Haver Analytics.

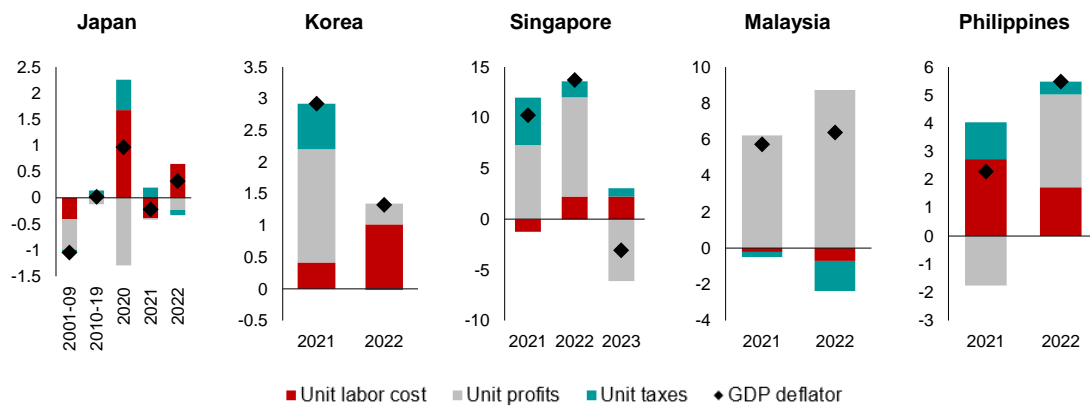
Appendix Figure 2.2. Selected ASEAN+3: Employment
(Index, 2019 average = 100)



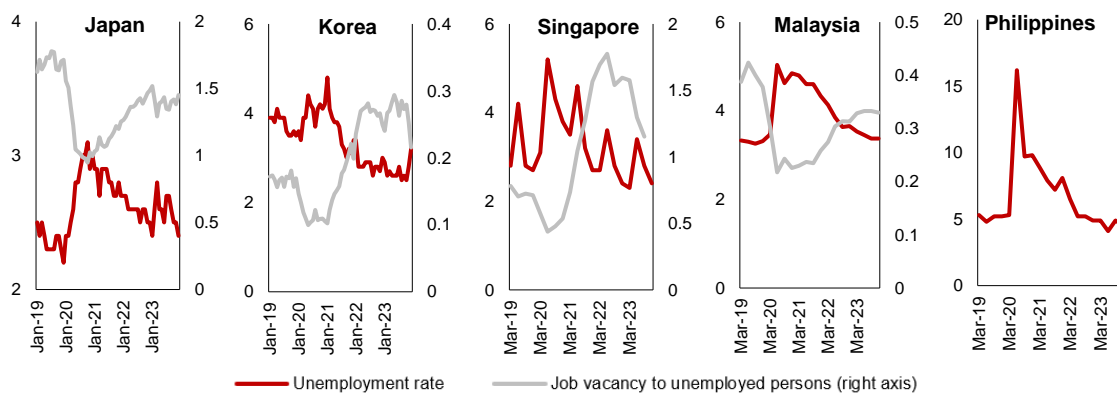
Source: National authorities via Haver Analytics, and AMRO staff calculations.

Unit labor cost was the major driver of GDP deflator for Japan, Korea, and Singapore in 2022 (Appendix Figure 2.3). When these economies reopened more fully during this period, labor markets exhibited signs of tightening—with unemployment rates decreasing towards pre-pandemic levels and the ratio of job vacancies to unemployed persons increasing concurrently (Appendix Figure 2.4). In Singapore, resident employment levels surpassed pre-pandemic levels in 2022, prompting the government to caution against raising wages too quickly (Krishnasamy 2022). Similarly, strong labor conditions in Japan kept upward pressure on wages, exacerbated by the government’s large economic stimulus package which included incentives for businesses to increase wages (Nohara and Yokoyama 2022). Korea’s unemployment rate fell to historic lows in August 2022, increasing the risk of a wage-price spiral and fueling expectations of further monetary tightening (Kim and Lee 2022).

Appendix Figure 2.3. Selected ASEAN+3: Average Contribution to the GDP Deflator
(Percentage points, year-on-year)



Appendix Figure 2.4. Selected ASEAN+3: Unemployment rate and Job Vacancy to Unemployment Ratio
(Percent of labor force; ratio)



Source: Department of Statistics Malaysia; National authorities via Haver Analytics; European Commission’s Directorate-General for Economic and Financial Affairs; AMRO staff calculations.
Note: Job vacancy data is unavailable for the Philippines.

On the other hand, the contribution of unit labor costs to the increase in the GDP deflator fell for Malaysia and the Philippines. Notably, the contribution of unit labor cost was negative for Malaysia in 2021 and decreased further in 2022. Unemployment rates in Malaysia remain above pre-pandemic levels, while the ratio of job vacancies to unemployed persons is lower than before the pre-pandemic, signaling a cooling labor market; growth in

private wages per worker was also negative throughout most of 2021 and 2022 (Bank Negara Malaysia 2023). Meanwhile, over 80 percent of Malaysia business had increased prices in response to inflation (Thornton 2022), thereby driving the increase in GDP deflator. In the Philippines, real wages remained flat while the aggregate gross revenue of Philippine companies grew by 17.5 percent in 2021 (Beltran 2023).

There are several drawbacks in using the GDP deflator as a measure of inflation. First, the GDP deflator reflects the average price changes for all goods and services produced in an economy, including those not typically consumed by households, such as government spending and investments. Second, since only the prices of domestically produced goods and services are included, import prices are excluded although imports may make up a significant part of consumer spending, especially in highly open economies like ASEAN. Third, this approach includes export prices, which would not affect local consumers as these goods are not consumed domestically. As a result, the GDP deflator may not accurately capture the change in prices faced by consumers. GDP by income is also not published on a timely basis by most regional economies, thus limiting the timeliness and coverage of assessment.

References

- Bank Negara Malaysia. 2023. "Analytical Approaches to Assessing Labour Market Conditions and Implications to Monetary Policy." *Economic and Monetary Review* 2022. Malaysia, March.
- Beltran, Michael. 2023. "Philippine workers seek hike in minimum wage amid inflation." Nikkei Asia, April 5. <https://asia.nikkei.com/Economy/Philippine-workers-seek-hike-in-minimum-wage-amid-inflation>
- Carstens, Agustin. 2022. "A Story of Tailwinds and Headwinds: Aggregate Supply and Macroeconomic Stabilization." Speech at Jackson Hole Economic Symposium. August 26. <https://www.bis.org/speeches/sp220826.htm>
- Celasun, Oya and others. 2022. "Supply Bottlenecks: Where, Why, How Much, and What Next?" IMF Working Paper 22/31, International Monetary Fund, Washington, DC.
- Grant Thornton. 2022. "Essential counter inflation actions for businesses." Grant Thornton Malaysia, March 10. <https://www.grantthornton.com.my/en/press/press-releases-2022/action-plan-inflation/>.
- Hansen, Niels-Jakob, Frederik Toscani, Jing Zhou. 2023. "The Role of Import Prices, Profits and Wages in the Current Inflation Episode in the Euro Area" IMF Working Paper 23/131, International Monetary Fund, Washington, DC.
- Kho, Catharine, and others. 2021. "Price Wars: The Return of ASEAN+3 Inflation?" AMRO Analytical Note, ASEAN+3 Macroeconomic Research Office, Singapore, September 24. <https://www.amro-asia.org/price-wars-the-return-of-asean3-inflation/>.
- Kho, Catharine, and Zhao, Hongyan. 2022. "Fueling Inflation in ASEAN+3: The Rising Price of Energy." AMRO Analytical Note, ASEAN+3 Macroeconomic Research Office, Singapore, September 15. <https://amro-asia.org/fueling-inflation-in-asean3-the-rising-price-of-energy/>.
- Kim, Cynthia and Lee, Jihoon. 2022. "South Korea's drum-tight job market fuels wage, rate hike pressures." Reuters, September 16.
- Krishnasamy, Janarthanan. 2022. "Wages 'increasing too quickly' amid tight labour market could hurt S'pore, Govt to cushion impact of inflation: DPM Wong." Today, September 29.
- Nohara, Yoshiaki and Yokoyama, Erica. 2022. "Japan's Job Market Remains Tight, Keeping Pressure on Wages." Bloomberg, November 29.
- Powell, Jerome H. 2023. "Speech at 24th Jacques Polak Annual Research." Washington D.C. November 9. <https://www.federalreserve.gov/newsevents/speech/powell20231109a.htm>
- Shapiro, Adam H. 2022. "A Simple Framework to Monitor Inflation," Federal Reserve Bank of San Francisco Working Paper No. 2020-29.