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- *El Niño is expected to strengthen in 2H, especially in the winter months*
- *Onset could be a stagflationary risk*
- *The economic impact will be dictated by its severity*
- *Besides hurting agriculture production and incomes, adverse weather could slow ongoing disinflation*
- *We compare the ASEAN-6 countries on a few vulnerability metrics*
- *Philippines is seen the most at risk, whilst Indonesia fares better on our comparative scale*
- **Implications for forecasts:** *We maintain our inflation and monetary policy projections for the year*

**ASEAN-6: Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam*

Adverse Weather Vulnerability Matrix

	Agri & allied sectors, % of GDP (2022)	Agriculture, % of overall employment (2022)	Weight of food in CPI, % (2022)	Cereal import dependency ratio, % (2018 - 2020)	Fiscal balance, % of GDP (2023f less 2015/16 avg)	Real rates buffer, z-score (June 2023)
Indonesia						
Malaysia						
Philippines						
Singapore*						
Thailand						
Vietnam						

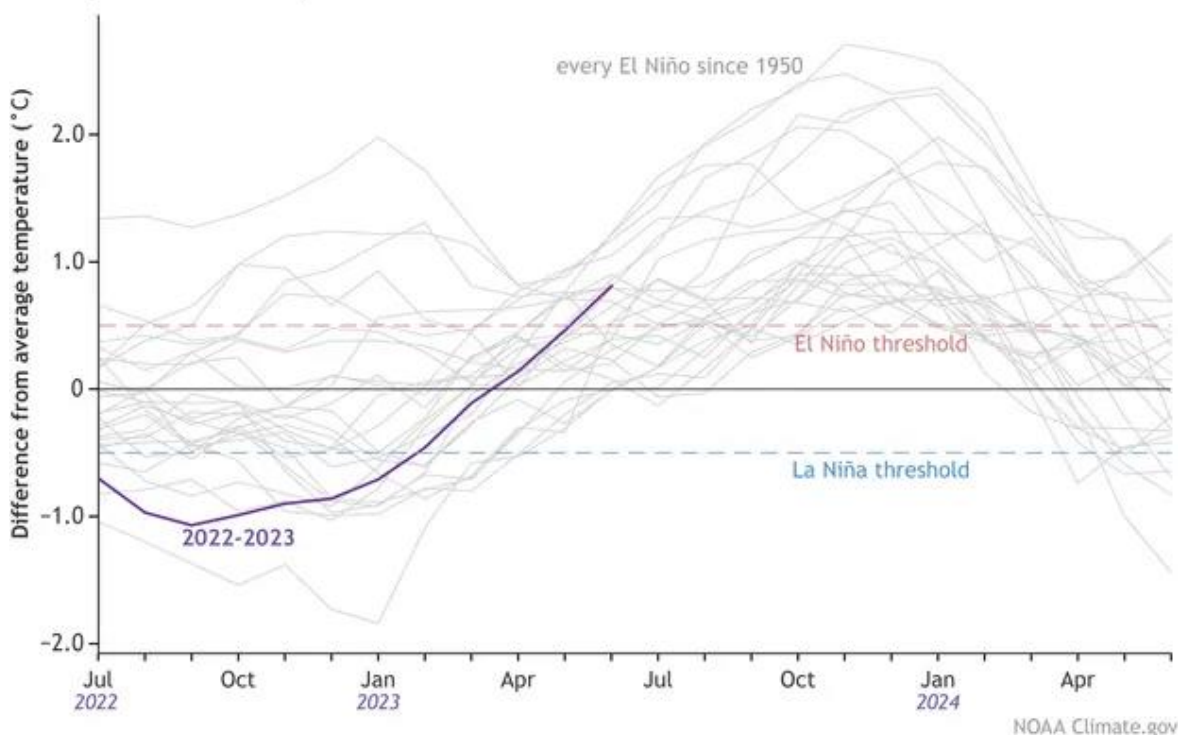
Source: CEIC, UN, DBS; More red = more vulnerable to weather shocks; Real rates z-score is calculated from Jan18 to Jun23

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The return of El Niño

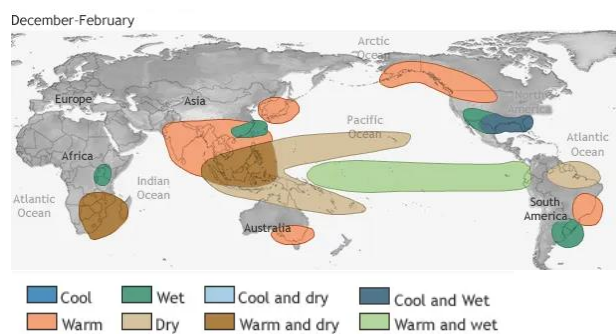
As various parts of Asia, Europe, and the US experience challenging weather conditions – ranging from heatwaves to floods, national authorities are also keeping an eye on the progress of El Niño. Since the UN's World Meteorological Organisation declared its onset a month back, the impact has been mild so far. In its [July update](#), the National Oceanic and Atmospheric Administration (NOAA) saw a 90% chance that El Niño will continue through 2H23, into the winter. One of the metrics for El Niño - Niño-3.4 Index - which measures the temperature of the surface of the central tropical Pacific Ocean stood at 0.8 °C above the long-term average in June, above the El Niño threshold of 0.5 °C (see image below). A study of another metric, the ENSO indicator shows a 90% chance that the event will last through the winter months but foresees a 20% chance that it will match the strength of 1997-98 or 2015-16 ([press release](#)).

Monthly sea surface temperature Niño 3.4 Index values



Source: NOAA (climate.gov)

El Niño Climate – regional distribution



Source: NOAA (climate.gov)

The other gauge, Indian Ocean Dipole, is seen shifting from the mid-point of Neutral-Positive IOD in July to positive by September. A NOAA study also shows that the impact on large swaths of Asia, especially ASEAN, tends to be dry and warm (see image), marked by high temperatures. Local meteorological departments have also started to build in the likelihood of more unfavourable weather conditions as we summarise in the next table. **At this juncture, we view developments as a potential risk event, with the economic impact to be dictated by its severity.**

Countries	El Niño expected timing
Indonesia	El Niño conditions started in June and will continue through September 2023, with the peak in September.
Malaysia	Weak El Niño conditions from June 2023, and expected to peak at the end of 2023 until early 2024.
Philippines	El Niño will likely develop between July to September 2023, and may persist until 2024.
Singapore	El Niño conditions are forecasted to develop in the second half of 2023.
Thailand	Thailand could experience dry conditions into November due to intensifying El Niño conditions, which could continue until early-2024.
Vietnam	El Niño phenomenon likely returned in early June, and may last into early-2024.

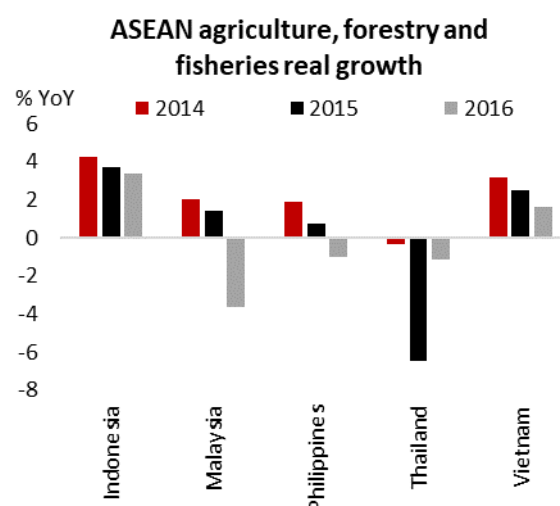
Source: News sources, DBS

Hurting agriculture production and incomes

Dry and warm conditions, besides a delay in rainfall due to a potential dialling up in El Niño severity poses the most direct threat to the ASEAN-6's agriculture sector. The region will feel the pain from any crop losses, as countries are key producers of some varieties. For rice, Thailand and Vietnam are globally the second and third largest rice exporters, together accounting for ~30% of the global share, behind India. Indonesia and Malaysia dominate the world palm oil market, with more than a combined market share of 80%. The proportion of 'agriculture, forestry, and fisheries' (AFF) employment remained sizeable at an average of ~24% in the region, even though the sector's share of the overall economy averaged at just ~10% of nominal GDP in 2022. A drop in agricultural production would certainly hurt incomes and private consumption.

Thailand is amongst the most exposed among ASEAN peers. During the previous strong El Niño episode in 2015-16, Thailand saw the most significant contraction in 'agriculture, forestry, and fisheries' output in 2015.

The 6.5% drop in real terms was due to the drought and low level of irrigation that affected yields of major crops. Farm income also tumbled sharply by ~15% YoY in both 2Q15 and 3Q15, even worse than the COVID-19 pandemic.



Source: CEIC, DBS

Note: Singapore is excluded as it has little local agricultural production, and relies mainly on imports

Dry weather could also result in forest fires and associating losses for Indonesia and Malaysia. **Malaysia's** agriculture output also saw a sizeable reduction of almost 4%, but the decline only occurred in 2016, given the lagged impact of El Niño on crude palm oil yields. The Malaysian Palm Oil Board said in May that the impact of El Niño this time would take about 15 to 18 months to impact palm oil production, suggesting that the negative impact could surface in 2024, rather than in 2023.

Philippines' agricultural growth had cooled significantly in 2015 due to El Niño conditions (2016 contraction was due to a typhoon). The negative impact this time round could be contained by administrative measures such as buffer stocking of inputs, adjusting planting calendar, and promoting drought-tolerant crops. Lastly, agriculture growth slowed in **Indonesia and Vietnam** in 2015/16, but were

not severely impacted due to government responses such as distribution of irrigation pumps to partly mitigate water shortages. That said, the potential negative impact on these two countries, in the event of a strong El Niño, should not be underestimated, given their above-average agriculture sector and employment shares.

The island-state of **Singapore** has little local agricultural production, and instead relies mainly on imports. **Yet, Singapore will face indirect impact from El Niño.** The country faces the risk of transboundary haze and air pollution, resulting from forest fires in Indonesia and Malaysia, due to dry weather brought about El Niño.



Regarding economic activity impact, tourism might be seen at risk from poor weather. **Yet, past data shows limited impact.** Despite the haze in 2015, 2016, and 2019, visitor arrivals managed to rise YoY, looking back at the Aug to Oct periods, when haze risks were the highest. The 2015 haze was severe, but did not stop Chinese tourists from returning, following their boycott of the region after 2014's MH370 disappearance. Moreover, the F1 grand prix in Sep 2015 attracted the third highest attendance

of 260,912 spectators over the three-day weekend at that point of reporting. We think the continued steady post-pandemic rebound in Chinese tourists will further drive the recovery in Singapore tourism. This will bode well for hospitality-related sectors such as accommodation and food & beverage services.

All told, Asia, including ASEAN's long-term growth trajectory, is vulnerable to climate related disruptions, with the EIU estimating 1.0-2.9% loss of output over the next two decades. These risks are amplified by the absence of sufficient mitigation tools, fiscal resources, and disaster recovery plans to address disruptions.

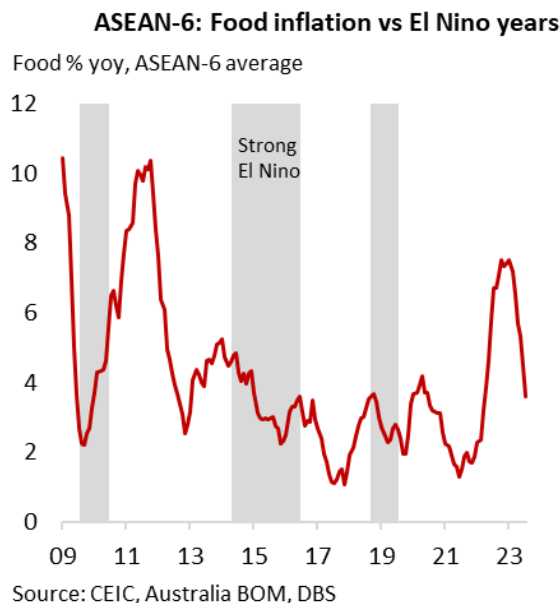
Proactive efforts to tackle inflation

Besides growth, the other key dynamic to discuss the impact of El Niño is inflation, with its onset viewed as a potential 'stagflationary' risk. Past occurrences of this weather pattern have resulted in drier conditions, high temperatures, and delay in rainfall. Typically, the impact manifests as a delay in crop sowing and hit to agricultural output, compounded by export bans by key trading partners, and higher power demand to counter high temperatures.

We mapped the average ASEAN-6 food inflation as well as for individual countries against El Niño occurrences in the past decade, including the severe bout in 2015-16 (see charts for individual countries at the end of the report). Surprisingly, the impact was not obvious, with a low correlation between the Southern Oscillation Index readings and food inflation.

The limited impact can be explained by the progress in the early warning weather systems as well as the governments' proactive food management response and support for the farm sector, which likely tempered the risk of a

sharp increase in inflation and other risk reduction actions.

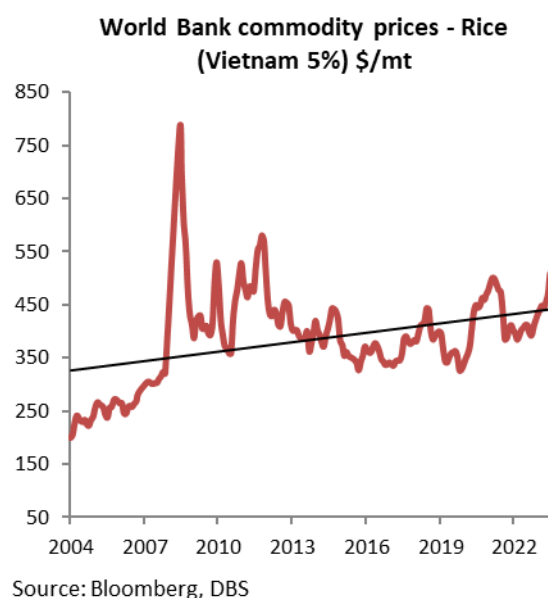


Additionally, during the adverse weather conditions in 2015-2016, global commodity prices, including crude oil, fertilisers etc, had corrected sharply on lingering China's slowdown concerns. This had helped the easing non-food costs to offset the pick-up in food and keep overall inflation in control.

Proactive steps by various national governments have included stronger irrigation systems for the farms, stepping up imports of cereals and foodgrains to cap domestic prices, stricter action against hoarders, investments in drought-resistant crop varieties, effective research into vulnerable crops, amongst others. For example, Indonesia's national logistics agency Bulog signed an agreement with four countries earlier in the year to import rice to quell rising domestic prices as well as build buffers. The Philippine government also plans to extend reduced import tariffs on rice and other commodities beyond 2023 to ease inflationary pressures.

That said, few crop groups are more vulnerable, especially rice. With El Niño now

expected to strengthen towards late-2023 and early-2024, concerns are that the winter and spring paddy production could be impacted, in a region which is one of the biggest consumers of the grain. Global prices have already begun to inch up (see chart), even though levels are not as elevated as the 2008 global rice crisis, when prices had tripled in a short period of four months.



This region is a mix of rice producers (Thailand and Vietnam), and importers (Indonesia, Philippines, and Singapore), with the latter more at risk, if weather conditions materially impact rice output. India, Thailand, and Vietnam account for more than half the global rice exports. To preserve domestic stocks, the world's largest exporter, India banned exports of non-basmati white rice, stoking global prices, and magnifying the shortfall in supplies. Thailand has urged its farmers to cut their rice planting to conserve water, and switch to less water consuming crops, after earlier suggestions to grow one paddy crop cycle instead of two. Reports suggest that seasonal rains are 40% below normal and reservoirs are half of their capacity. For now, Vietnam supplies are on track, with the government expecting to

exceed its target of rice exports in 2023 without comprising on domestic supplies.

Policy dynamics

With Thailand delivering its last policy rate hike in August, all of the ASEAN-6 central banks have entered a pause on the monetary policy front. Vietnam is most dovish in the region, pivoting to rate cuts to support flagging growth as we noted in [ASEAN-6: Inflation retreat to make room for policy shift](#). Rhetoric from the central banks suggest that most are keeping their eyes trained on developments and are unwilling to lower their vigilance despite inflation returning back to policy targets in most countries. Bank Indonesia estimated that end-year inflation might inch up to 3.5% YoY vs its baseline of 3.2% if adverse weather were to drive prices higher. BSP Deputy Governor had estimated a moderate 13bps upside risk to annual inflation. Severity of the weather phenomenon will have a bearing on its actual impact this year.

Monetary policy is unlikely to be used to contain supply-driven price shocks, although rate cuts might be delayed.

Onus will be on administrative measures to take pre-emptive action and address supply shortages.

Mapping net impact

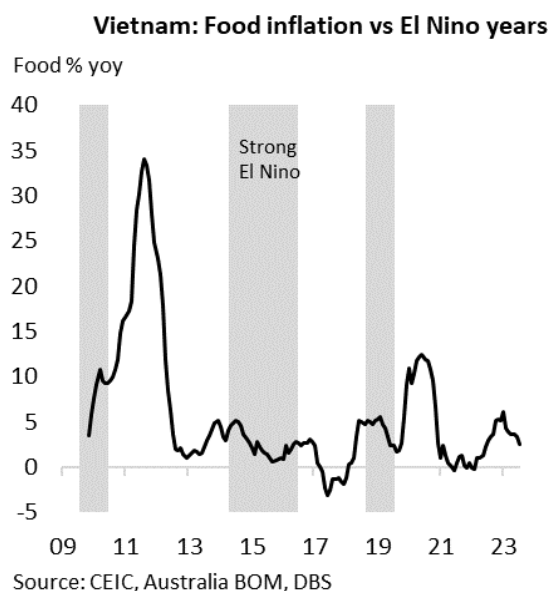
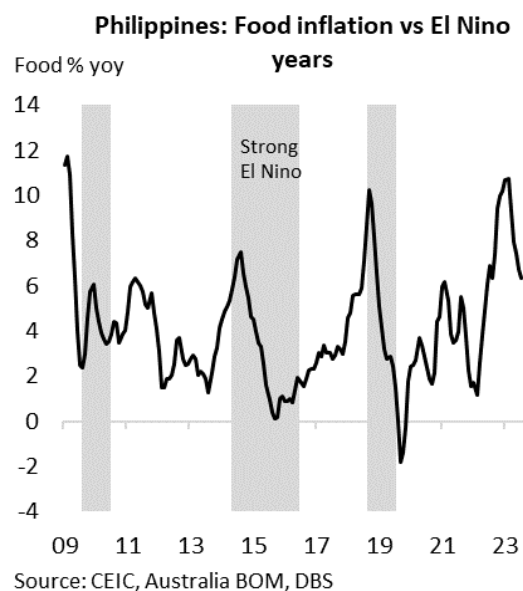
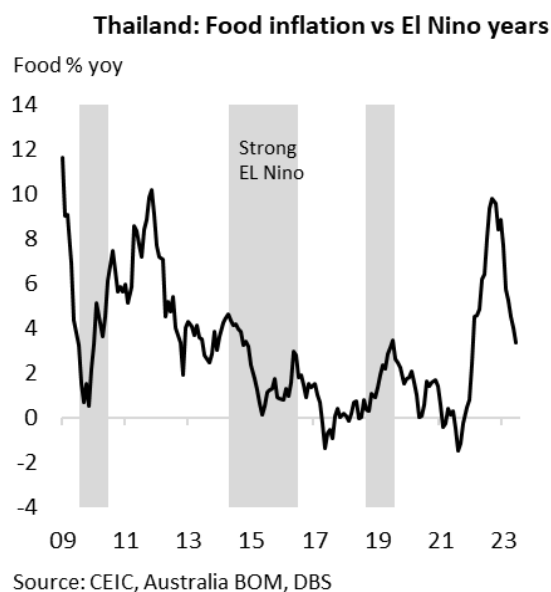
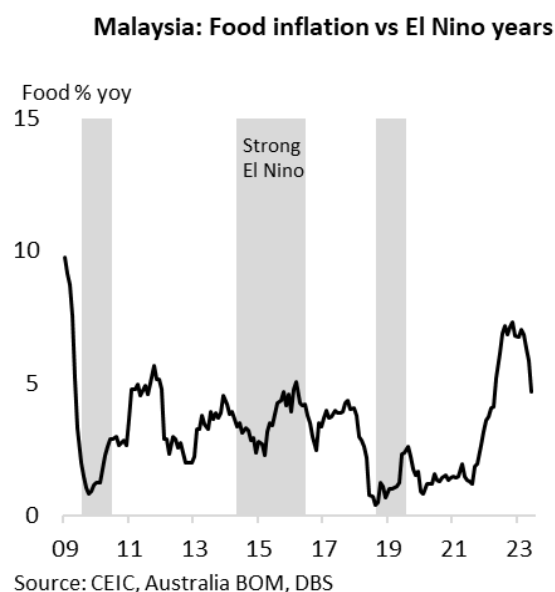
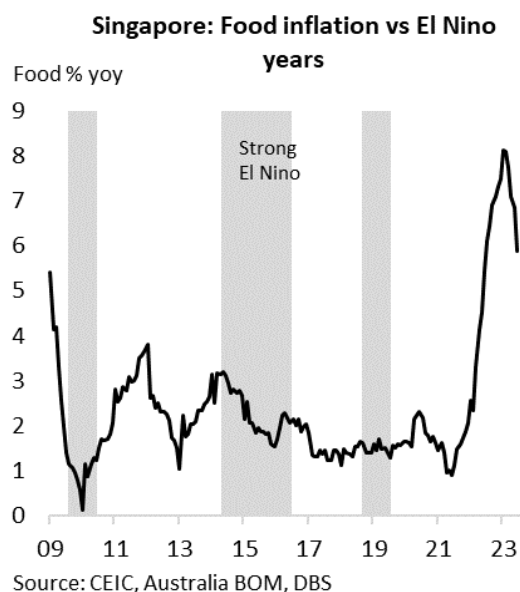
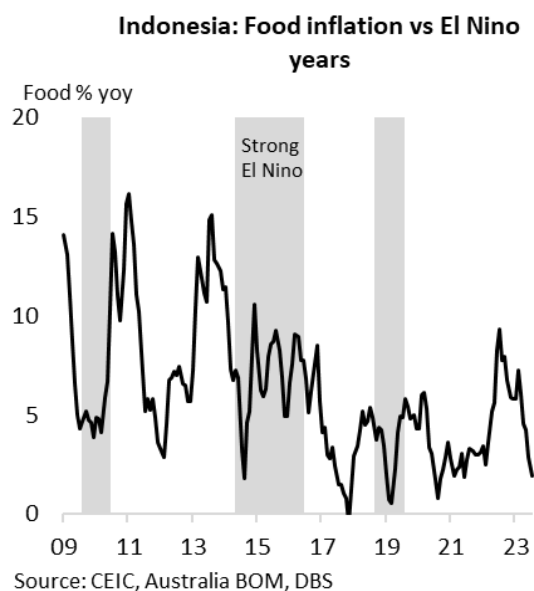
We summarise the various comparison points raised in this note across the ASEAN-6 countries to map their respective vulnerabilities. Growth-inflation risks are determined by the high weightage of food in the inflation basket and cereal import dependency, compared to the contribution of the agriculture (and allied) sector to overall GDP as well as the proportion of employed in the sector. Agri sector makes up about 12% of GDP in **Indonesia and Thailand**, with close to 30% of the sector employing about a third of the total population in Indonesia, Thailand, and Vietnam. Food accounts for the largest weight in the inflation basket in **Thailand and Philippines**. **Malaysia and Philippines** are highly dependent on cereal imports, alongside **Singapore**, with the latter highly vulnerable to food price shocks, as it imports over 90% of its food, although diversified from multiple sources. The ability to counteract any downside risks to growth and upside risks to inflation will be dictated by the available fiscal and monetary policy headroom. Across the six metrics (see table below), Philippines is seen the most at risk, whilst Indonesia fares better on our comparative scale.

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Sources: Data for all charts and tables are from CEIC, Bloomberg and DBS Group Research (forecasts and transformations)

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