El Niño and sovereign macro risk

Kamesh Korangi*, Rose Choy | 19 Oct 2026 | 20 minute read

SUMMARY

- A 2015-16 sized El Niño would increase food inflation by 3.5% from base in exposed non-energy commodity exporting countries
- Previous severe El Niño episodes have coincided with market shocks; their direct impact has not been clear to investors. We seek to address this
- The current macro backdrop differs with higher rates, debt and volatility could worsen potential shock from the 2016 El Niño and have spillover effects globally
- Indonesia, Brazil, Colombia are the most vulnerable sovereigns
- Historical credit spread volatility suggests El Niño-related spread impacts for countries at risk

The 2026 "super" El Niño is arriving at a moment of acute fiscal vulnerability, against a backdrop of high global sovereign debt stocks, wide fiscal deficits and a lack of monetary policy space to absorb shocks relative to prior El Niño cycles. In this paper, we analyse the current El Niño phenomenon and how it compares with historical precedents. We then examine the transmission channels along which the climate pattern could influence sovereign yields around the world. To conclude, we produce a ranking of 91 sovereigns that have bond market exposure to this El Niño and show how food inflation, energy inflation, economic growth and public debt responded to strong El Niño years since 1990. El Niño's impacts on these macro factors are used to generate country-level sensitivity scores, which reveal that Indonesia, Brazil and Ecuador to be those most at risk from the current cycle. We also look to see if any such risks have been quantified in the forward-looking metrics used in our Co_2liseum analytics for sovereigns.

Physical climate impacts, like those presented by El Niño vary in frequency and severity. However, this cycle coincides with a particularly fraught macro environment relative to previous events. Geopolitical risks are surging, countries are ramping up defence spending, supply chains are being disrupted, and energy prices are soaring. These factors are shrinking the fiscal room available to states and contributing to higher sovereign borrowing costs.

Figure 1: Overall El Niño sensitivity against countries with largest debt outstanding. Source: AFII analysis, IMF, World Bank, accessed: 8 Oct 2026.

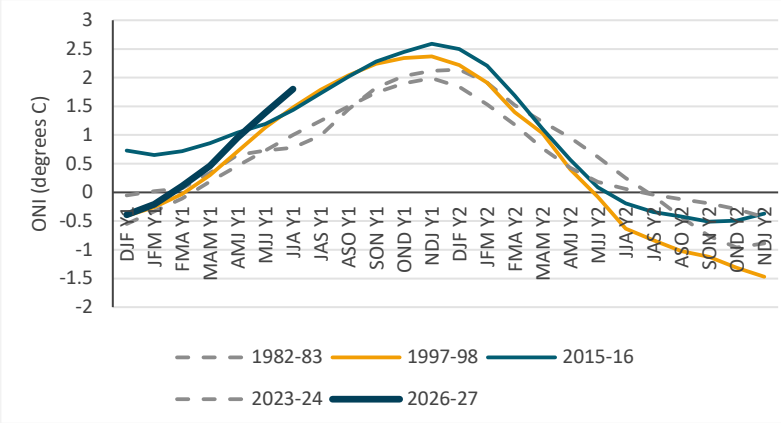


*Author to contact: kko@anthropocenefii.org. See important disclaimer.

Introduction

The Climate Prediction Centre puts the probability of a "very strong" El Niño during the northern hemisphere winter of 2026 to 2027 at greater than 90%, and the probability that it reaches "super" strength at 63%.[1] For October to December, it assigns a 75% chance of an event stronger than anything recorded since 1950.

Figure 2: The 2026 to 2027 El Niño against its strong precedents, aligned from the onset of each episode. Source: NOAA Climate Prediction Center, AFII Analysis, World Bank, accessed 2 Oct 2026.



There is a rich literature suggesting that the ensuing physical climate shocks could influence sovereign pricing. Across a panel of 52 economies, the European Central Bank found that droughts and storms raise sovereign yields, with larger and faster responses in developing economies and those where fiscal space is limited.[2] Similarly, IMF research across 98 economies finds that climate vulnerability raises yields and spreads after controlling for conventional fundamentals.[3] Specifically on El Niño, a World Bank study covering seven Latin American sovereigns finds that strong events are followed by a significant short-term widening of spreads.[4]

Macro factors such as food inflation, energy inflation, GDP growth, and debt/GDP ratio changes are some of the transmission channels through El Niño impacts can be studied. Historically, El Niño effects differ sharply by country. For example, the phenomenon is associated with output losses in Indonesia and India and inflation pressures elsewhere through food, energy, and non-fuel commodity prices.[5] Growth effects can persist for several years after the event.[6] While industry studies have covered the commodity and currency implications in depth, they have not touched on sovereign credit risk analysis.[7] [8] [9] This paper aims to address this gap by analysing the effects on many sovereigns over a long time period. The results are mixed, since in previous cycles the impacts have been localised, and the markets had sufficient buffers to absorb shocks, particularly at the sovereign level – for example, fiscal room to increase borrowing or activate subsidies and other means of support.

Compared to past decade's disinflationary regimes, today's markets are different, facing supply chain shocks and higher inflation not just locally, but globally. These macro conditions are raising the cost of capital and

[1] "ENSO Diagnostic Discussion, September 2026", NOAA Climate Prediction Center, 10 Sep 2026.
[2] "Decoding climate-related risks in sovereign bond pricing: a global perspective", ECB Working Paper 3135, Anyfantaki, S., Blix Grimaldi, M., Madeira, C., Malovana, S. and Papadopoulos, G., 8 Oct 2025.
[3] "This Changes Everything: Climate Shocks and Sovereign Bonds", IMF Working Paper 20/79, Cevik, S. and Jalles, J. T., 5 Jun 2020.
[4] "Climate and sovereign risk: The Latin American experience with strong ENSO events", World Development 178, Damette, O., Mathonnat, C. and Thavard, J., 13 Mar 2024.
[5] "Fair Weather or Foul? The Macroeconomic Effects of El Niño", IMF Working Paper 15/89, Cashin, P., Mohaddes, K. and Raissi, M., 30 Apr 2015.
[6] "Persistent effect of El Niño on global economic growth", Science 380, Callahan, C. W. and Mankin, J. S., 18 May 2023.
[7] "What a Super El Niño Means for Inflation and Global Markets", Morgan Stanley, 12 Aug 2026.
[8] "Picture this: super El Niño economic impact scenarios", S&P Global Market Intelligence, 5 Aug 2026.
[9] "Investment themes for emerging market debt, Q3 2026", J.P. Morgan Asset Management, Accessed 9 Oct 2026.

increasing the debt burdens across countries, while adding to volatility in fixed income markets already under strain because of the AI trade. **In an increasingly interconnected world, risks once contained within El Niño affected regions can now transmit across borders, with global implications.**

The next section covers salient datapoints on previous El Niño episodes and their effects. We then apply a panel data regression model to four macro-economic factors over time to manufacture an overall sensitivity score for El Niño. This is compared with movements in CDS spreads during recent cycles. This is followed by a drilldown on two specific regions — Southeast Asia and Latin America — which are the two regions most vulnerable to a strong El Niño. Finally, we apply the Co_2liseum transition analytics for sovereigns to see if this system's quantitative scores capture El Niño risks.[10] In addition, likely inflation scenarios are studied for the current El Niño and placed in the current macroeconomic context. We conclude with the key results, share the limitations inherent to our approach, and suggest next steps for addressing physical risks that are systematic and localised at the same time.

Sovereign data – macroeconomic factors and market pricing

We start with a 184-country panel covering the period 1990 to 2024 to assess four macro factors: food inflation, energy inflation, real GDP growth, and the change in public debt to GDP ratio. These factors were chosen because of the availability of time-series data and for their influence on bond markets. Inflation and growth data is sourced mainly from the World Bank's global inflation database, with national datasets used for some energy series. Debt outstanding and related data is from the IMF Global Debt Database. Monthly food and headline prices come from the World Bank's global inflation database, extended with OECD and IMF series to September 2026. El Niño episodes are dated using NOAA's Oceanic Niño Index (ONI). Where the latest data is missing, we filled gaps using the IMF World Economic Outlook (April 2026).

For market pricing impact, we use weekly 5-year sovereign CDS spreads from Bloomberg split into two windows bracketing the last two strong El Niño episodes (2015-2017 and 2023-2025). The chosen metric is CDS volatility, defined as the standard deviation of weekly changes in the spread within each month, averaged over the window. [11]

Historical macro impact on headline inflation and GDP growth

Before turning to the model, here we review the raw data directly to better visualise El Niño impacts over time. The last four El Niño episodes to reach a peak ONI of 1.5 or more began in 1997 (peak 2.4), followed by 2009 (1.5), 2015 (2.6), and 2023 (2.0). The 2026 episode is already above this threshold (Figure 3, top). For each episode, we compare the metrics for each country over the three years prior with those for one year (Y+1) or two years (Y+2) post.

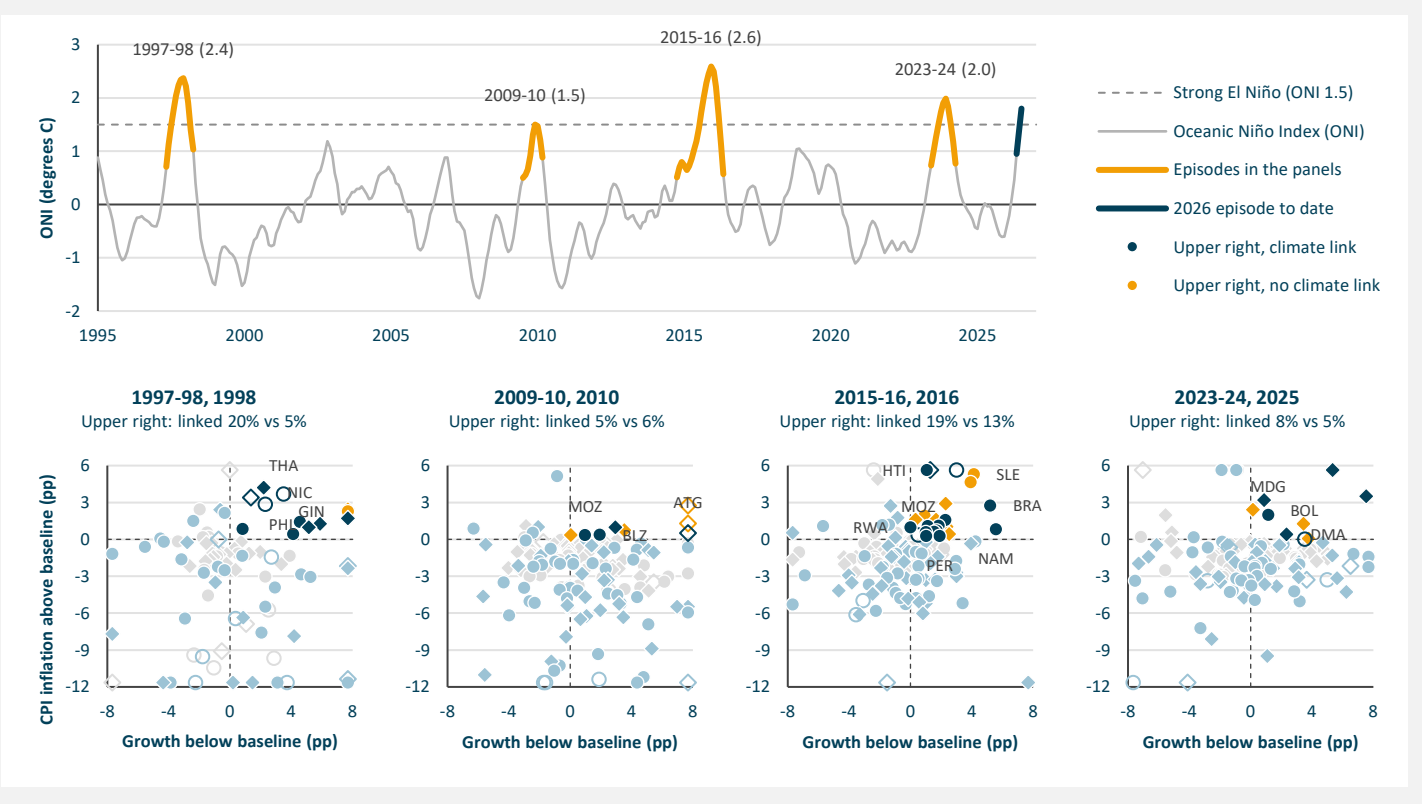
We use headline CPI inflation and real GDP growth as the two macro factors because they are simple and broadly available.[12] Countries with inflation above their baselines and growth below their baselines are situated in the upper right quadrant of Figure 3 (bottom). They are coloured dark blue if they exhibit a

[10] For full methodology refer to "Co2liseum transition analytics", AFII, 2026.
[11] A country needs at least six months of data, and if spreads don't change over 6 months they are excluded.
[12] Fuel exporters are left out, as their inflation and growth follow oil prices, and so are countries during periods of hyperinflation (>50% CPI)

moderate-to-strong El Niño linkage (Appendix A) and in orange if they do not. The circles indicate net exporters of non-energy commodities and the diamonds mark net importers.

The full list of non-energy commodity exporters and importers is in Appendix B Table 4.

Figure 3. El Niño strength since 1995, with the four strong episodes shown below in orange (top). Circles are net commodity exporters and diamonds importers; countries in the upper right are dark blue with a strong or moderate El Niño climate link and orange without; hollow markers are off scale, shown at the edge; 2025 values are partly IMF estimates. Source: World Bank WDI, IMF World Economic Outlook, NOAA CPC, AFII analysis, Accessed 6 Oct 2026.



The 1997-98 episode shows the expected pattern most clearly. In 1998, one year after El Niño onset, 20% of countries with a clear El Niño link saw inflation soar above, and growth plunge below, their respective baselines, versus 5% among those without such a link (Figure 3, bottom first panel). The ten linked countries split evenly between commodity exporters (India, Malaysia, Thailand, Nicaragua, and Fiji) and importers (Japan, Korea, the Philippines, Nepal, and St Kitts and Nevis). However, the Asian financial crisis hit Malaysia, Thailand, Korea, and the Philippines in the same year, which explains much of their respective moves.

The 2009-10 episode shows how a global shock can swamp the climate signal and associated financial markets risks. In 2010, inflation trended below its pre-onset baseline in 90% of countries after the financial crisis, with only 8 of 138 in the upper right quadrant (second panel). Countries with an El Niño link were no more likely to be in this quadrant than those without, at 5% versus 6%. In this instance, the Global Financial Crisis dominated the macro risk environment, bringing with it disinflation and significant central bank interventions.

In 2015-16 the gap between country groups is smaller, but the trade pattern is pronounced. In 2016, 19% of countries with an El Niño link are in the upper right quadrant, against 13% of those without (third panel).

Fourteen of the 15 linked countries in this case are commodity exporters, among them Brazil, Peru, Chile, Uruguay, Paraguay, Zambia, Mozambique, and Namibia. The 2015-16 macro risk environment was dominated by commodity price drops led by crude. For exporters, this meant the El Niño shock to output coincided with a fall in export prices, obscuring causality.

The most recent episode's signal is again difficult to separate from the broader macro environment. In 2025, two years after the 2023 El Niño onset, 8% of countries with an El Niño link were in the upper right quadrant, against 5% of those without (fourth panel). The years for comparison (2020-2022) covered the global COVID-19 pandemic and the inflation spike due to Russia's invasion of Ukraine. Taken together, these factors contributed to lower inflation for 88% of countries in the post-onset window.

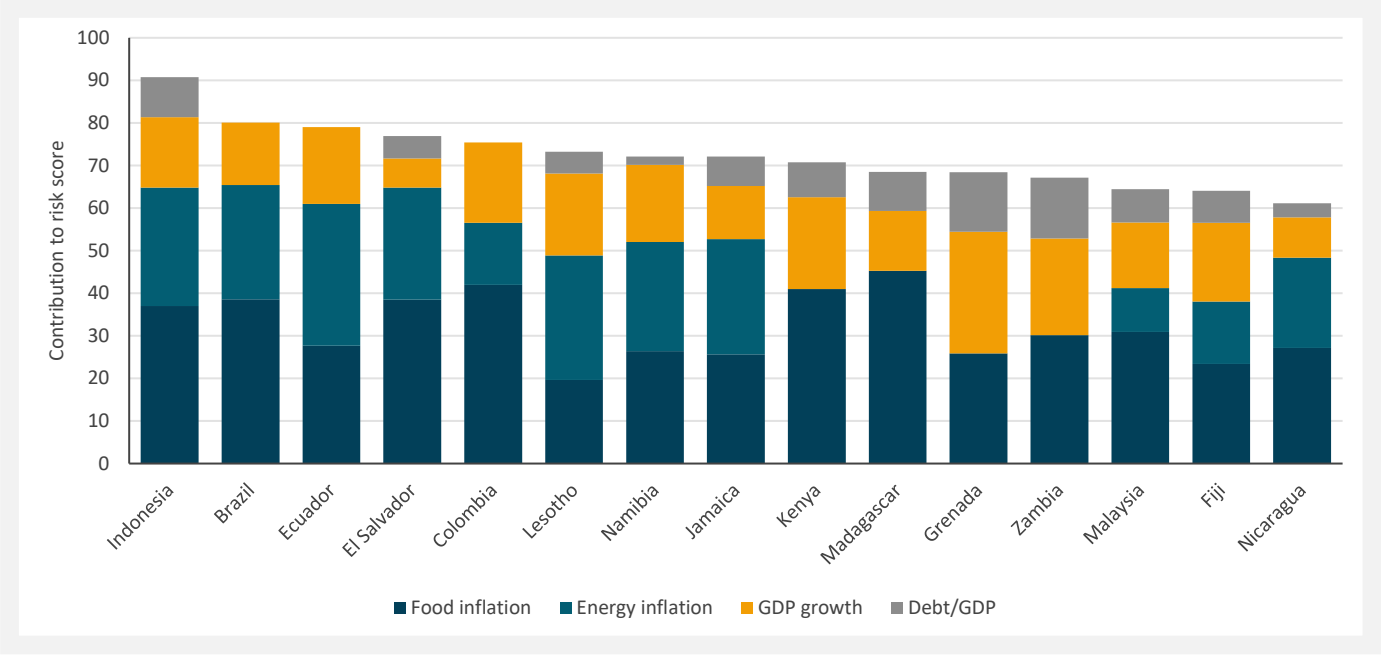
To summarise, each El Niño episode coincided with its own macro shock: the Asian financial crisis in 1997, the global financial crisis in 2009, the commodity bust in 2015, and the post-COVID/Russia-Ukraine war inflation in 2023. These shocks moved many countries' metrics at once. The El Niño signal, in comparison, made only a small difference across and between countries. Indeed, it falls just short of conventional statistical significance.

In the next section, we use a more comprehensive approach to rank the countries that are most sensitive to El Niño and present several recent studies that highlight the concomitant risks.

Country ranking for El Niño

Each sovereign is assigned a risk score from 0 to 100 that accounts for its food, energy, growth, and debt responses to strong El Niño years, weighted 40%, 30%, 20%, and 10%. The sovereigns with the highest scores, and the contribution of each factor, are shown below. We also show how the size of public debt changes the picture. The method and data are in Appendices B and C.

Figure 4. Countries with the highest El Niño risk scores and the contribution of each channel to the score. Source: AFII analysis, World Bank, OECD, IMF, accessed 8 Oct 2026.

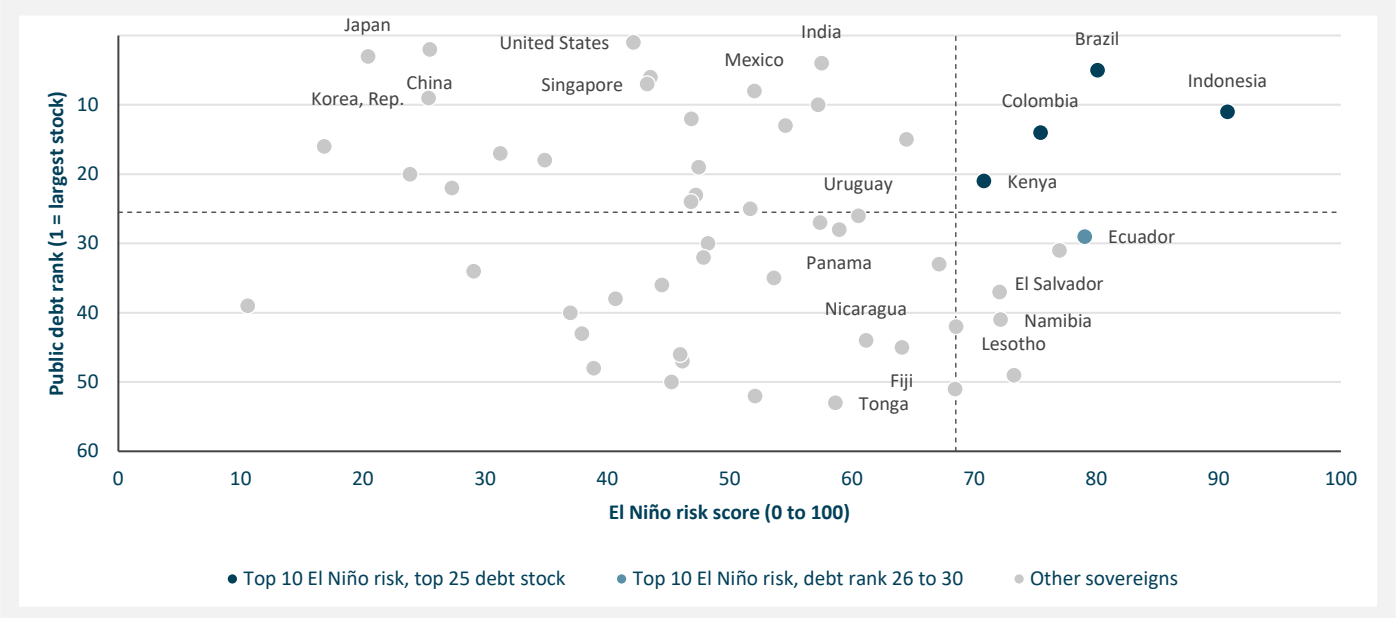


Note that these scores also pick up macro volatility from the crises and wars referenced in the above section. Two crises coincided with strong El Niños: the Asian financial crisis of 1997-98 and the commodity slump of 2015-16. Crisis years outside El Niño years are filtered out. The headline ranking is then restricted to the 53 countries with an established El Niño rainfall or temperature response, and they are rescored against each other.[13] Figure 4 shows the leading scores and the contribution of each channel. **Indonesia, Brazil, and Ecuador are revealed to be the most at risk when accounting for all four macro channels. Countries in Southeast Asia, Latin America, and parts of Africa round out the top of the rankings.** We unpack the scores for Southeast Asia and Latin America in more detail in the next section. The full rankings are in Appendix D.

Figure 5 shows the scores for all countries vis-à-vis their outstanding public debt. The ten highest scoring countries have a median debt rank of 30 out of 53, and only four rank in the top 25 by debt outstanding: Brazil is 5th, Indonesia 11th, Colombia 14th, and Kenya 21st. These four are situated in the upper right quadrant of Figure 5, and are the countries where El Niño exposure and a high stock of debt coincide. Most of the top ranking countries have small debt burdens. Ecuador ranks 29th by debt (lightly shaded in Figure 4). China ranks 2nd by debt but only 48th on El Niño risk, and Mexico, 8th by debt, ranks 25th on El Niño. This suggests debt size alone does not make a sovereign more exposed.

Food prices are the largest contributor to El Niño scores for most of the leading names. Large debt issuers, like Japan and the United States, do not exhibit El Niño risk and are situated in the upper left quadrant. These countries may still experience second-order El Niño impacts via a general worldwide increase in inflation and spillover effects from local country shocks. The higher debt burden of these countries could also contribute to spread volatility, as can already be seen in certain advanced economies.

Figure 5. El Niño risk score against public debt rank, with the sovereigns in the top 10 for El Niño risk and the top 25 by debt stock highlighted in the upper right quadrant, and top 10 names ranked 26th to 30th by debt shaded lighter. Source: AFII analysis, World Bank, IMF, accessed 8 Oct 2026.

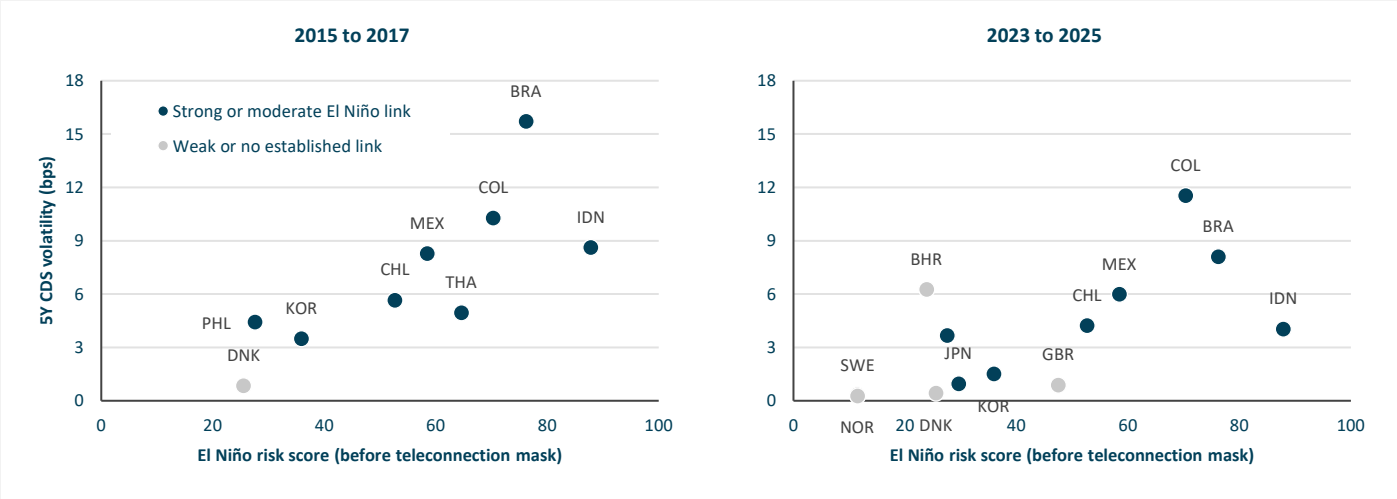


[13] "Global and Regional Scale Precipitation Patterns Associated with the El Niño/Southern Oscillation", Monthly Weather Review 115, Ropelewski, C. F. and Halpert, M. S., Aug 1987.

El Niño sensitivity and CDS spreads

If markets priced El Niño exposure, the most sensitive sovereigns would exhibit more volatile credit spreads around strong episodes. We compare each sovereign's El Niño risk score with the volatility of its 5-year CDS spread in 2015-2017 and 2023-2025 (Figure 6) for countries with CDS data. The comparison uses the model's score for all eligible sovereigns, before the El Niño link mask is applied, so that developed market CDS curves serve as a low-sensitivity reference. Nine sovereigns in the first window and 13 in the second window have the requisite data for this analysis.

Figure 6. El Niño risk score against the volatility of 5-year sovereign CDS spreads, 2015 to 2017 (left) and 2023 to 2025 (right). Source: Bloomberg, World Bank, IMF, AFII analysis, Accessed 8 Oct 2026.



The association is strong in the 2015-2017 window. The rank correlation between El Niño score and CDS volatility is 0.88, with Indonesia, Brazil, and Colombia performing highly on both. The correlation is somewhat weaker, at 0.68, in 2023-2025. Among the emerging market sovereigns alone, correlation is 0.77 in the first window and 0.30 in the second, for six and five countries, respectively. Brazil was an outlier during the 2015-2017 episode, as it experienced a spike in energy inflation caused by drought conditions at its water reservoirs. Droughts afflict the country periodically, but these were more severe due to the weather conditions of El Niño.[14] Fiscal risks contributed as well, with currency depreciation in Brazil hitting around 30% during those times.

Neither window shows that markets definitively price El Niño risks. CDS volatility moves almost one for one with the level of the spread, with a rank correlation of 0.95 or more, and the higher scoring sovereigns are mostly the higher yielding credits. Measured relative to the spread level, there is no link between volatility and El Niño risk score in 2015-2017 (0.18). While there is a significant one in 2023-2025 (0.75), this is true for only 13 sovereigns. Volatility also fell between the two windows for most sovereigns, despite the stronger El Niño in 2023 to 2024: Brazil from 15.7bps to 8.1bps and Indonesia from 8.6bps to 4.0bps. Colombia is the exception, with volatility rising from 10.3bps to 11.5bps. Put simply, the CDS evidence is consistent with the ranking but does not confirm it.

[14] "Analysis of the 2012-2016 drought in the northeast Brazil and its impacts on the Sobradinho water reservoir", Remote Sensing Letters 9, de Azevedo, S. C., Cardim, G. P., Puga, F., Singh, R. P. and da Silva, E. A., 6 Feb 2018.

The El Niño risk scores reveal three standout regions: Southeast Asia, Latin America, and Sub-Saharan African nations. In the next section, we delve into two of these regions to understand intra-country differences in market pricing and explore government responses which can complement quantitative approaches.

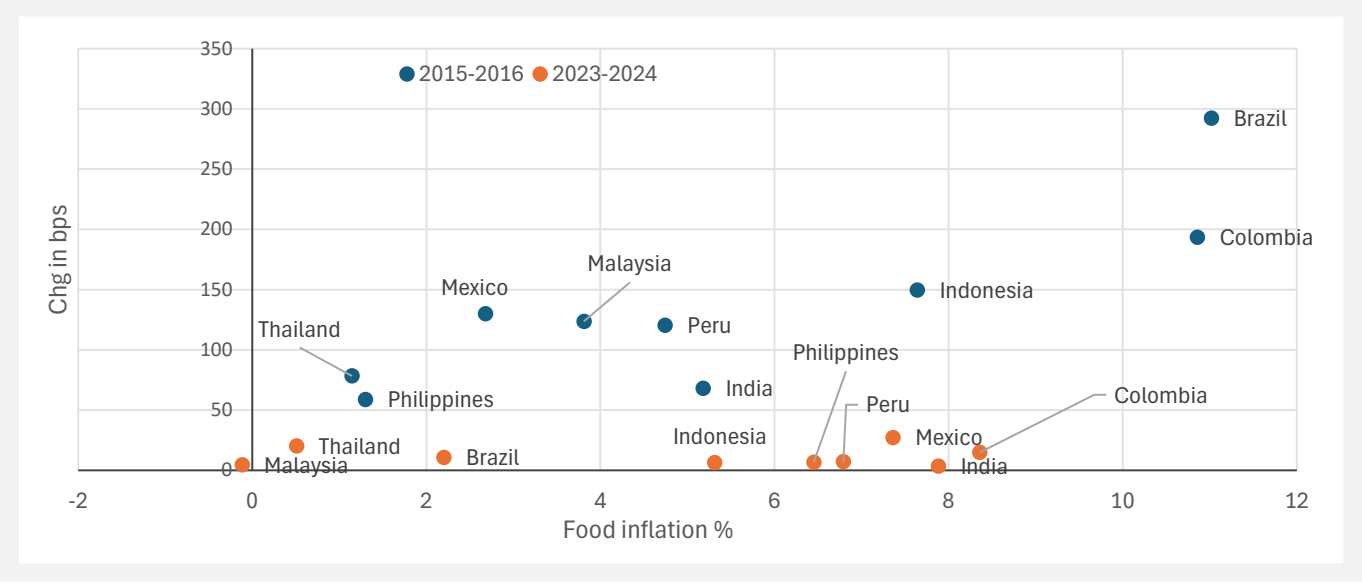
Southeast Asia and LATAM

Here, our focus turns to the following two sets of countries: India, Indonesia, Philippines, Malaysia, Thailand, Vietnam; and Brazil, Colombia, Ecuador, Peru, and Mexico. These countries have data on historical local and/or USD sovereign debt, historical inflation, and fiscal indicators. They cover the earlier El Niño risk scoring. Indonesia, Brazil, Ecuador and Colombia are in the top five, Malaysia, India, Thailand and Mexico rank between 13th and 25th, Vietnam and the Philippines rank 44th and 52nd, and Peru cannot be scored (Appendix D).

These show that historically, the risk transmission channel from food inflation to sovereign bond yields is the most powerful and acts most quickly in Southeast Asia and Latin America. Food as a percentage of the CPI basket is higher in Southeast Asia (at 25-46%) than it is in developed markets. In Latin America, the percentage varies from 15-27%. This is an important differentiator, as the more severe droughts and floods witnessed during El Niño episodes has caused crop failures or significantly lower crop yields, leading to higher food inflation. Agricultural exports in some countries have also been hit in the past, affecting these countries' revenues. Central bank action can go some way to curbing these inflationary effects. For example, some of the ASEAN Central Banks have been swift to implement rate hikes in 2026 to curb inflation. However, in the LATAM region, responses have been mixed, with Colombia hiking and Brazil cutting rates.

Severe El Niño-related droughts have also disrupted hydropower production in at-risk countries. For some LATAM countries, such as Colombia and Ecuador, a large share of their energy mix is derived from hydropower. Droughts in these regions have caused water reservoirs to plummet, crimping energy generation. As a result, food and energy inflation have spiked.

Figure 7. 5 yr CDS change on (y-axis) versus average food inflation (x-axis) over El Nino period 2023-2024. Source: Blomberg Finance L.P. accessed 9 Oct 2026.

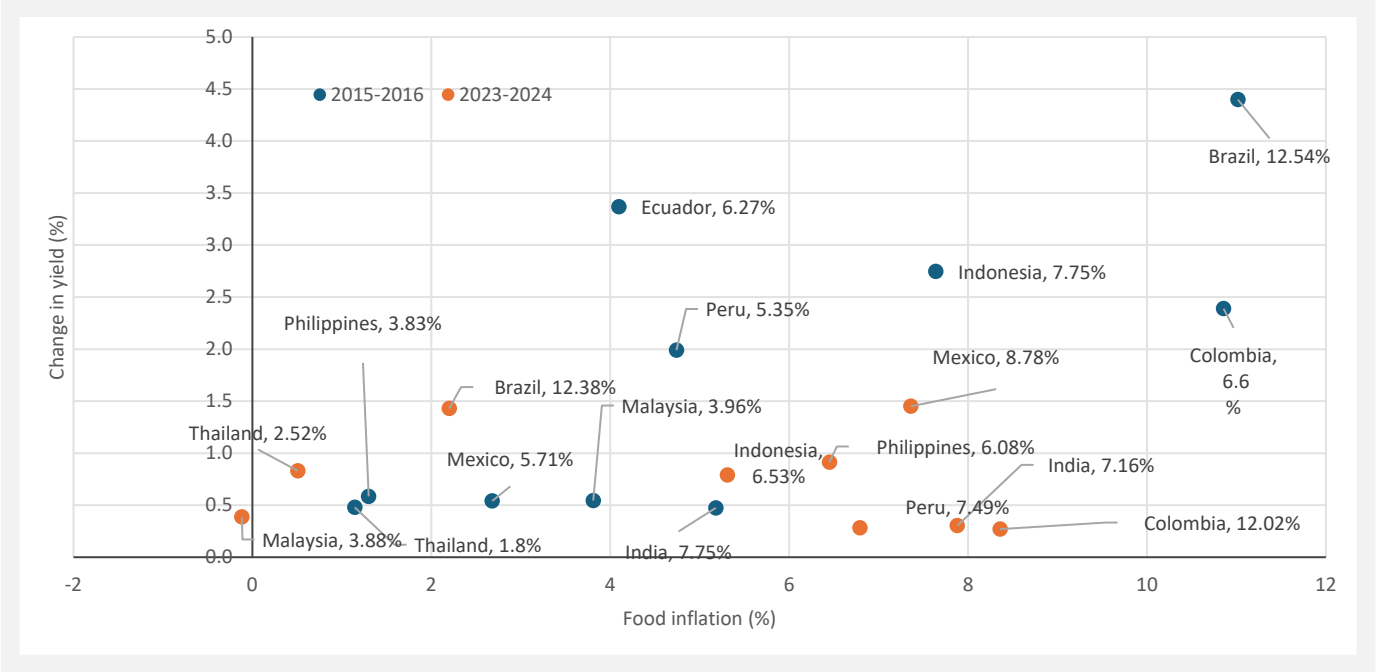


In Figures 7 and 8, we map credit spreads and local bond yields to average food and energy inflation observed during the El Niño episodes in 2015-2016 and 2023-2024 and show the correlation. These two specific episodes were chosen out of the five observed El Niño periods because their strength is closest to the current Super El Niño, and they have the most observable data. The 1997-98 period data was incomplete for most countries on CDS and bond yields. **From the observations, it is apparent that the 2015-2016 period showed a stronger correlation between food inflation and energy inflation and changes in credit spreads and local bond yields.**

Figure 7 shows the change in 5-yr CDS within the El Niño periods observed in 2015-2016 and 2023-2024. These changes are calculated as the highest CDS level during the period minus the starting CDS level. Food inflation is calculated as the average monthly inflation observed on a year-over-year basis. Note that Ecuador is not included because of its distressed trading levels in both periods.

Figure 8 shows the change in absolute local bond yields for the two observed El Niño periods against average food inflation over the same period. Bond yield change is calculated as the highest yield of the 10-yr local bond during the period minus the starting yield. Ecuador is again the exception here as it does not have a local bond, so the USD 5.5% 2040 (ISIN: XS1080330704) is used as a proxy (this is one of the restructured tranches of debt from Ecuador's restructuring in 2020).

Figure 8. Change in local sovereign bond yield (%) (y-axis) versus average food inflation %. The figure after the country denotes starting local 10-yr rate in the El-Nino period. Source: Bloomberg Finance L.P., accessed 9 Oct 2026

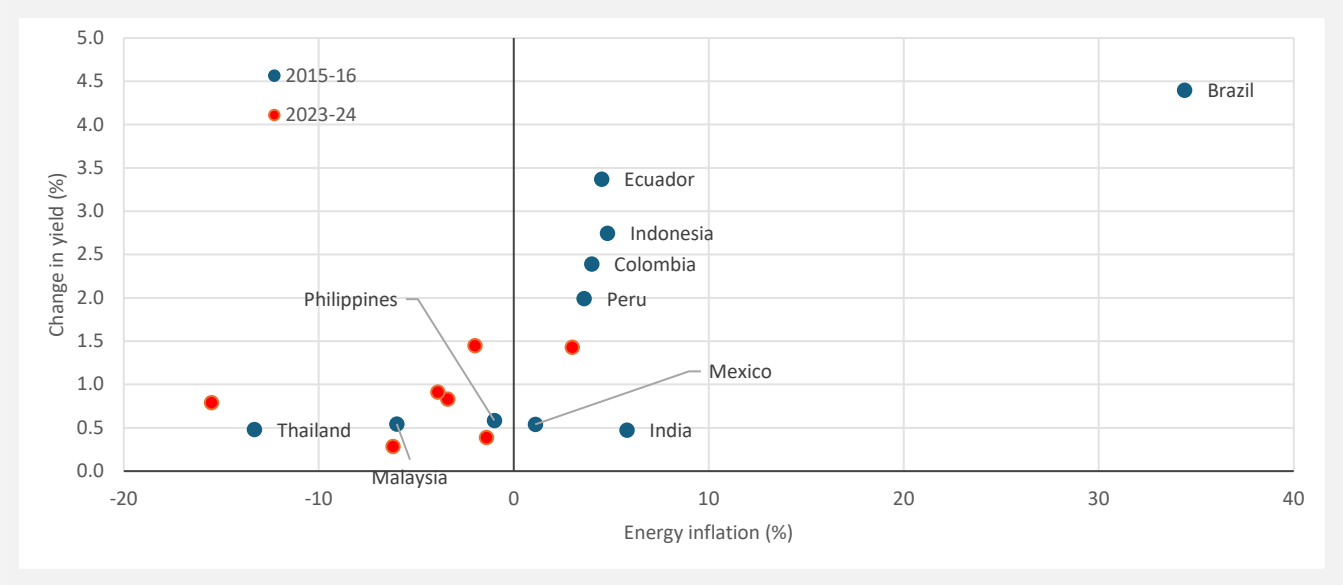


The 2023-2024 El Niño period shows minimal impact on bond yields and credit spreads for most countries observed, except for Ecuador. In Figure 11, Ecuador is *not* denoted in the chart as it is an outlier, with a change in local bond yield of 9% over the period versus a food inflation average of 5.4%. Ecuador experienced various political and fiscal crises in the period alongside the El Niño shock.

Energy inflation represents an important risk transmission channel and could influence the cost of sovereign credit or financing. Notably, Ecuador's reliance on hydropower for most of its electricity resulted in electricity rationing in some regions of the country during the El Niño drought conditions of 2023-2024.

For the other ASEAN and LATAM countries, yield and spread impacts seemed to be much less severe than the 2015-2016 El Niño episode. This could be due to the already elevated bond yields/local rates and higher credit spreads in 2022 and early 2023 due to the Russia-Ukraine war, which raised energy, fertiliser, wheat, and grain import prices. This meant that by the time El Niño surfaced in 2023, these countries already had higher financing costs and local rates.

Figure 9. Change in local bond yields (y-axis) versus energy inflation. Source: Bloomberg Finance L.P., World Bank, accessed 9 Oct 2026.



Energy inflation has a less obvious or direct correlation with yields and spreads for most of the countries above, with Brazil being an outlier. One notable aspect captured in the 2023-2024 period is that while energy prices initially spiked in 2022 because of the Russia-Ukraine war, they then fell in the ensuing 2023 period, driving overall inflation down. Because starting rates for the 2023 period (captured in Figure 11) for many of the countries were already high, and thus the impact on both local bond yields and rates was very muted.

In summary, Indonesia, Brazil, Colombia and Ecuador demonstrated a larger change in yield and CDS spread, mainly due to food inflation, especially during 2015-2016 period.

Fiscal response to El Niño

ASEAN governments have responded to the 2015-2016 and 2023-24 El Niño episodes by providing targeted compensation to farmers, offering rice assistance and agricultural production support, and authorising fiscal cash transfers. The most explicit packages were in Indonesia (2023-4), which provided a total IDR10.2trn of support,[15] and Thailand (2015-2016), which provided THB85bn to farmers.[16] In short, disruption to food and energy prices have in the past led governments to spend more, leading to larger fiscal deficits. In 2026 to date, there are signs that Indonesia and the Philippines have government spending and agricultural plans in place for El Niño, although there have been no official announcements of pre-positioned financing. However, Indonesia is currently experiencing a ferocious outbreak of wildfires, which is likely to incur large economic, social, and environmental costs.

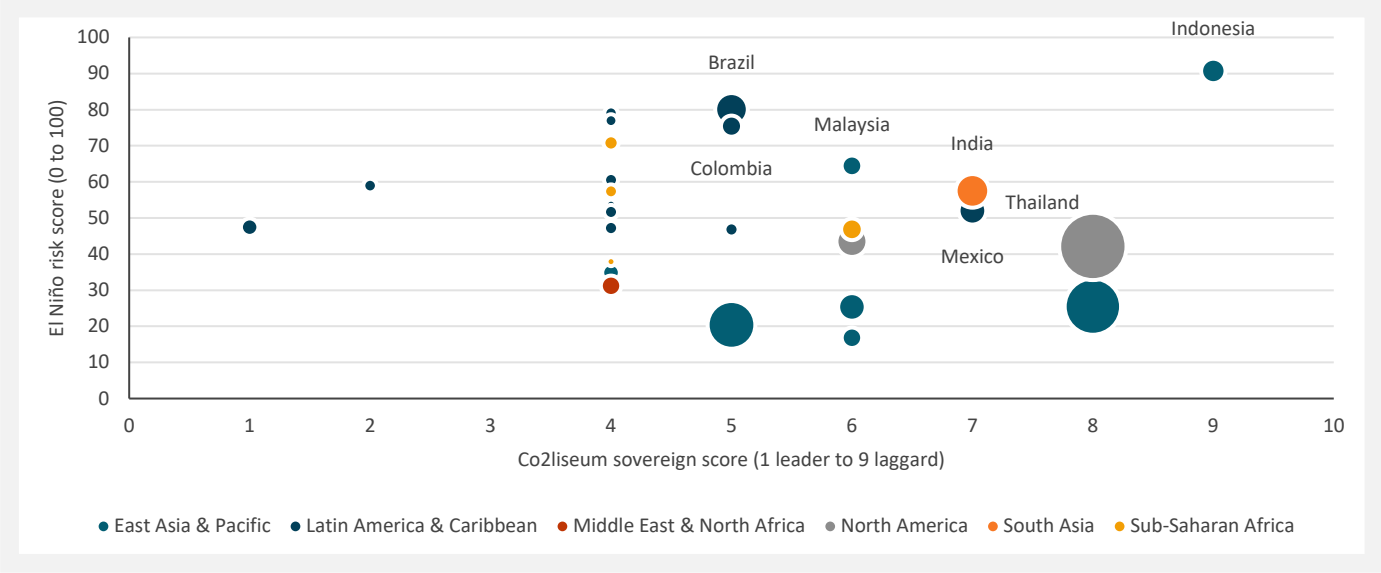
[15] "Indonesia to Distribute Rp7.52t Nationwide BLT Assistance Over El Nino", Tempo, 25 Oct 2023.
[16] "Thailand approves $1.8 billion in loans for farmers hit by drought", Reuters, 13 Jul 2015.

In LATAM, El Niño-specific public spending has been more fragmented than in Southeast Asia. Colombia is the exception. In 2015-16, Colombia provided direct support to producers and subsidised agricultural credit and crop insurance. In 2026 so far, the country has pre-positioned a large amount of financing to address potential El Niño impacts. CAF (Corporación Andina de Fomento) pre-approved a USD1bn El Niño contingency credit line for vulnerable LATAM countries.[17] Colombia itself allocated roughly COP4trn under a national disaster framework, including support for the energy sector, subsidies for low-income households, and potential fertilizer subsidies.[18] Meanwhile, Peru activated its National Emergency Operations Centre and approved/advanced budget increases totalling over PEN3bn for El Niño prevention, response, and infrastructure support and over PEN 8bn of supplementary budget including contingent financing for El Nino and other government priorities.[19] [20] Brazil released BR1.3bn, mainly to support the drought-prone northeast of the country with grain stockpiles, hydrological monitoring, wildfire prevention, and some insurance support.[21]

Co_2liseum transition analytics overlay[22]

AFII's Co_2liseum transition analytics for sovereigns quantifies transition risk from emissions trends, NDCs and clean energy share in an economy into a single score. Co_2liseum scores run from 1 to 9; lower scores indicate transition leaders. We overlay AFII's sovereign Co_2liseum scores onto El Niño-sensitive countries to see if there is an intersection with higher transition and El Niño risk scores.

Figure 10. Co_2liseum sovereign score against El Niño risk score, with bubble size increasing with public debt outstanding. Source: AFII Co_2liseum, World Bank, IMF, Accessed 8 Oct 2026.



There are five countries with Co_2liseum scores of 6 or worse and above-median El Niño risk scores.

[17] "CAF makes US$1bn available in response to the risk of a 'super El Niño' in Latin America and the Caribbean", BNamericas, 5 Oct 2026.
[18] "Gustavo Petro destina $4 billones para mitigar el impacto de El Niño en Colombia este año", Vanguardia, 21 Jul 2026.
[19] "Latin America prepares for El Niño's varied impacts", Valor International, 17 Sep 2026.
[20] "Gobierno de Perú pide al Congreso un crédito suplementario de 2.300 millones de dólares", Infobae, 6 Oct 2026.
[21] "Government releases R$1.3bn to address El Niño impacts", Valor International, 30 Jul 2026.
[22] For full methodology refer to "Co2liseum transition analytics", AFII, 2026. See our Co_2liseum website here, including our Disclaimer Notice

Indonesia is the standout. It carries a Co_2liseum score of 9, the laggard in the sovereign universe ranks first for El Niño risk and has USD 547bn of public debt outstanding. India, Thailand and Mexico score 7 and rank between 19th and 25th, with India's USD 2,024bn and Mexico's USD 920bn the largest debt stocks on the list. Malaysia, at 6, ranks 13th.

Of the 53 El Niño-ranked sovereigns, 35 carry a Co_2liseum score. Seven of the top 20 most El Niño sensitive names, including Lesotho, Madagascar, and Zambia, are unrated by Co_2liseum, so the overlay is thinnest where the physical exposure is potentially among the greatest.

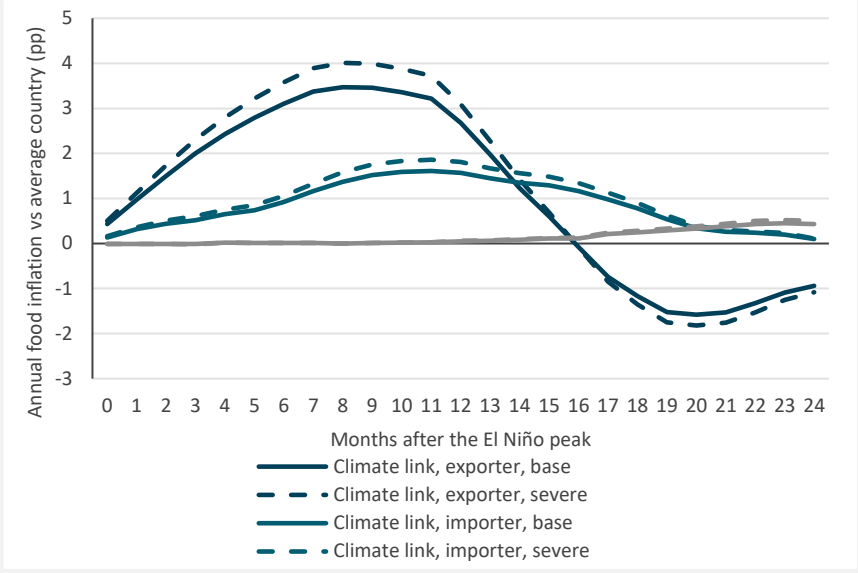
Sovereigns are distributed uniformly with most falling around the average of 4, and countries with high El Nino risk scores holding Co_2liseum scores ranging from 4 to 9 showing some physical risk components that could likely complement the quantified approach.

What the 2026 El Niño could mean for inflation, credit and rates

The food inflation model (Appendix B) can be used to estimate inflation trajectories over the coming years in the wake of this current super El Niño. The base case uses the same severity as the 2015-2016 episode, a peak ONI of 2.6 around December 2026, while the severe case peaks at 3.0, in line with the CPC's central outlook (Appendix F).

In the base case, annual food inflation among commodity exporters with a El Niño link is about 3.5% above other countries eight months after the peak, around August 2027, and 4% above base in the severe case (Figure 11). For a typical exporter in the top 20, with base food inflation near 5%, that means a flood inflation rate close to 8.5%. Importers with a El Niño link see a smaller, delayed rise of about 1.6 points a year after the peak. The headline inflation reading for a typical basket with a 15-40% weighting to food will rise by half this amount. The rise is temporary: as prices settle, food inflation among exporters runs about 1.5 points below normal in mid-2028. These are moves relative to other countries. An absolute increase in world level food inflation will likely make the relative moves worse. In our ranking, Indonesia, Ecuador, Brazil, Colombia, Zambia, Kenya, and Namibia look particularly vulnerable. The full ranking is in Appendix D.

Figure 11. Change in annual food inflation after a 2026-27 El Niño peak, relative to the average country, for a peak ONI of 2.6 (base, solid) and 3.0 (severe, dashed). Source: World Bank, OECD, IMF, NOAA, AFII analysis, Accessed 8 Oct 2026.



This 2026 El Niño episode is occurring at a time when global debt burdens are historically elevated. Debt is now structurally higher than in the pre-COVID-19 period (and prior El Niño cycles) with public debt pressuring governments in complex ways. Government debt is higher as both advanced and emerging economies borrow more (see Figure 12). Higher interest rates globally also impact

borrowing costs.[23] As governments continue to spend more, there is less fiscal space in most countries to cut spending.

Some countries that have experienced large shocks from previous El-Nino episodes have built stronger institutional preparedness for the current 2026-7 El-Nino, with earlier response capacity. However, these countries may still face larger fiscal costs and outlays depending on the severity of the episode. Starting debt positions are materially worse than 2015 (or 2023 for some) as can be seen in Figure 13. Therefore, there could be less fiscal room to absorb larger El Nino shock, given already persistent fiscal deficits. The credit impact could be larger this time. In addition, the global rate environment is more difficult, as developed market central banks are still on a synchronised rate hike cycle.

Figure 12. General government gross debt by country group (% of GDP). World is the two groups weighted by GDP in US dollars; 2025 and 2026 are IMF estimates and projections. Source: IMF World Economic Outlook April 2026, AFII, Accessed 6 Oct 2026.

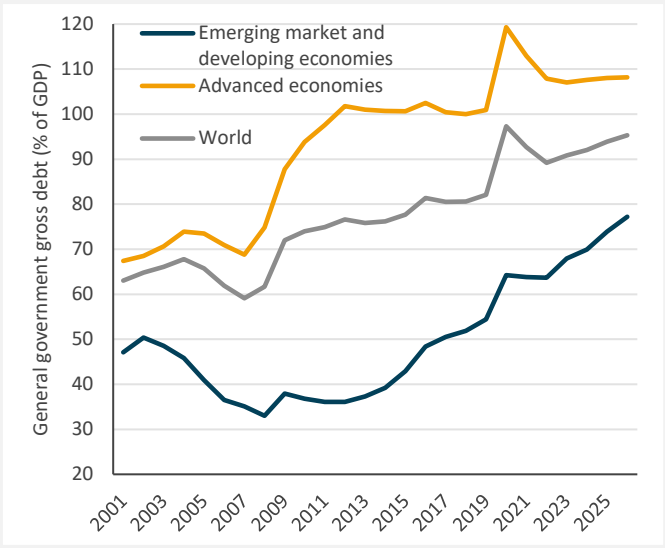
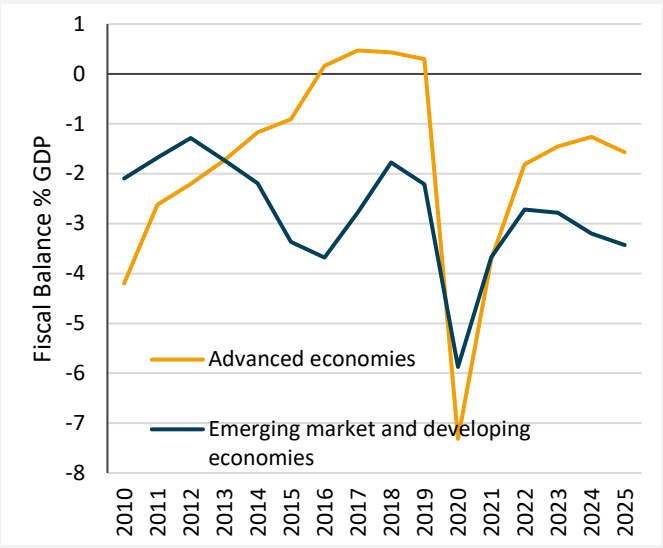


Figure 13. Fiscal balance as a % GDP. Source: World Bank Group. A Cross-Country Database of Fiscal Space, Accessed 12 Oct 2026.



The combination of higher financing rates due to monetary policy and potentially higher debt-to-GDP ratios caused by higher fiscal deficits will drive sovereign bond yields up. Depending on the import-export dynamics of affected economies, trade balances could alter, too. This in turn could affect FX reserves. All these factors in combination could pressure a country's currency relative to its peers, leading to potential devaluations. As a result, fiscal space could be further curtailed and monetary policy constrained. Local and external debt yield curves could be more vulnerable to inflation surprises.

Outlook for ASEAN and LATAM

The two regions of interest in this paper are already showing deterioration. Since April 2026, Indonesia and the Philippines have registered much higher food inflation year-over-year relative to average food inflation in 2025. Colombia and Peru have also seen food inflation grow significantly higher. Debt-to-GDP ratios have worsened for the analysed countries, significantly for Indonesia, Thailand, the Philippines, Brazil, Colombia and Ecuador compared to 2015. Indonesia's debt-to-GDP while higher than previous cycle's, is still relatively low at 41%. Its Baa2 and BBB sovereign rating is on negative outlook from both Moody's and Fitch since

[23] "Tight spreads, rising rates: why transition risk and resilience is the next big credit differentiator", AFII, 2 Oct 2026.

Feb/Mar this year citing policy uncertainty and weakening policy credibility of the government. While a larger spending from potential El Niño disaster relief would be temporary and likely not impact its ratings, this would cause its bond yields to become more volatile. Fiscal deficits as a % of GDP now persist in all these countries, and are high for the Philippines, India, Brazil, and Colombia (see Appendix E Table 5 for fiscal indicators). Given structurally higher debt levels and fiscal deficits, an inflation shock from the current El Niño could produce an even larger fiscal deterioration than in prior episodes. This could be further exacerbated by the existing energy shock from the still unresolved US-Iran war. In addition, physical risks from flooding or droughts/wildfires as a risk transmission channel have not yet been quantified but could add to a deteriorating fiscal position. Indonesia is currently experiencing wildfires that could incur significant economic losses and likely add to its fiscal pressure. For context, the 2015 fires in Indonesia were estimated to have cost the country roughly USD16bn, or some 1.9% of 2015 GDP. The current fires are severe, but available data is insufficient to project an overall cost.

Conclusions

The current El Niño cycle reached an ONI level of +1.80 in June to August, against +1.48 in 1997 and +1.44 in 2015 at the same stage. The CPC puts the probability of this episode becoming a “super” El Niño at 63%. Using a panel data regression model on four macro factors (food inflation, energy inflation, debt-to-GDP, and GDP growth) we score countries on their El Niño risk.

We find that **Southeast Asian exposure is concentrated in Indonesia, while Latin America has five sovereigns in the global top ten.** Four sovereigns combine a top 10 El Niño score with a top 25 debt stock: Indonesia, Brazil, Colombia, and Kenya, with Ecuador just outside. With debt loads higher than in 2015, these countries have less fiscal room to absorb another shock.

Every strong El Niño episode since 1990 overlapped with a macro shock. This makes it difficult to isolate such events in market pricing. Sovereigns with higher El Niño risk scores had more volatile CDS spreads during the 2015-2017 episode. Most of this reflects credit quality, but 2023-2025 offers a first and tentative sign that markets price El Niño exposure. **The models also miss some exposures that are established in other studies.** Peru cannot be scored, Papua New Guinea has no modelled channel, the Philippines ranks 52nd of 53 on El Niño risk despite sitting in the core drought zone, and Zimbabwe drops out for thin coverage despite declaring a national disaster in 2023 to 2024.

In a repeat of the 2015-2016 El Niño, annual food inflation among commodity exporters with an El Niño link could run about 3.5 percentage points above other countries eight months after the peak, and 4.0 points at a peak ONI of 3.0. **The most vulnerable countries remain Indonesia, Colombia, Ecuador, and Brazil in this current El Niño cycle**. Importers with a El Niño link would see about 1.6 points of inflation above base a year after. The raw record is mixed, as each strong episode since 1997 came with a global shock that moved inflation metrics across almost every country.

Increasing physical risk poses major challenges to these sovereigns going forward. While it remains challenging isolating El Niño risk from macro risk factors, this study goes some way towards supporting the idea that it can be measured. Countries likely to be most impacted are now preparing responses that markets could reward through lower volatility and borrowing costs.

Appendix A

Countries with an El Niño climate link

Identifying the countries with an El Niño climate link in the existing literature was the first puzzle. Mapping them from regions into specific countries and mapping them to their ISO code. The classification is on four types of climate link, strong, moderate, weak and none. Table 1 shows this classification. Countries in grey are not in our scored sample (no usable data or fewer than three channels to model on).

The tiers are our country reading of the regional El Niño rainfall and temperature map of Ropelewski and Halpert (1987),[24] as updated to current periods by NOAA CPC and IRI.[25] Strong means a robust response of consistent sign, moderate a weaker, seasonal or regional one. West and Central Africa and parts of the Middle East and North Africa are weak, and all other countries in Europe or North America are none.

The tiers broadly match the country measure of Callahan and Mankin (2023):[26] it covers 40 of our 53 linked countries, and 35 of them score above its median. For the remaining 38 countries with no link in our sample 9 of them score above its median. For simplicity where they differ, we keep our tiers. Eight West and Central African countries score high on that measure because it counts temperature, and the whole tropics warm in El Niño years, but the rainfall response that drives harvests there is inconsistent. Saudi Arabia scores above the median with no physical channel. Australia, Uruguay, New Zealand, Canada and China score low because a national average dilutes a regional response. Thirteen economies it does not cover, mostly small islands, keep the tier of their region.

Table 1. El Niño climate link tiers by region: Countries out of scope due to data availability are in grey. Source: AFII analysis, Ropelewski and Halpert (1987), NOAA CPC, IRI, Accessed 7 Oct 2026.

Tier	Region	Coverage	Country list
Strong	Maritime Continent and western Pacific	7/19	Australia, Brunei, Fiji, Indonesia, Kiribati, Malaysia, Marshall Islands, Micronesia, Nauru, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Timor-Leste, Tonga, Tuvalu, Vanuatu
Strong	South Asia	3/8	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Strong	Western South America	4/5	Bolivia, Chile, Colombia, Ecuador, Peru
Strong	Rest of South America	3/7	Argentina, Brazil, Guyana, Paraguay, Suriname, Uruguay, Venezuela
Strong	Central America and the Caribbean	12/21	Antigua and Barbuda, Bahamas, Barbados, Belize, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago
Strong	Southern Africa	7/11	Angola, Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe
Strong	Equatorial and eastern Africa	4/11	Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Tanzania, Uganda
Moderate	Mainland Southeast Asia	3/5	Cambodia, Laos, Myanmar, Thailand, Vietnam
Moderate	Mid-latitude and island economies	10/13	Cabo Verde, Canada, China, Comoros, Hong Kong, Japan, Mauritius, Mongolia, New Zealand, Seychelles, South Korea, Taiwan, United States
Weak	West and Central Africa	10/23	Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, DR Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Republic of Congo, Sao Tome and Principe, Senegal, Sierra Leone, Togo
Weak	Middle East and North Africa	1/8	Algeria, Egypt, Iran, Iraq, Libya, Morocco, Tunisia, Turkiye

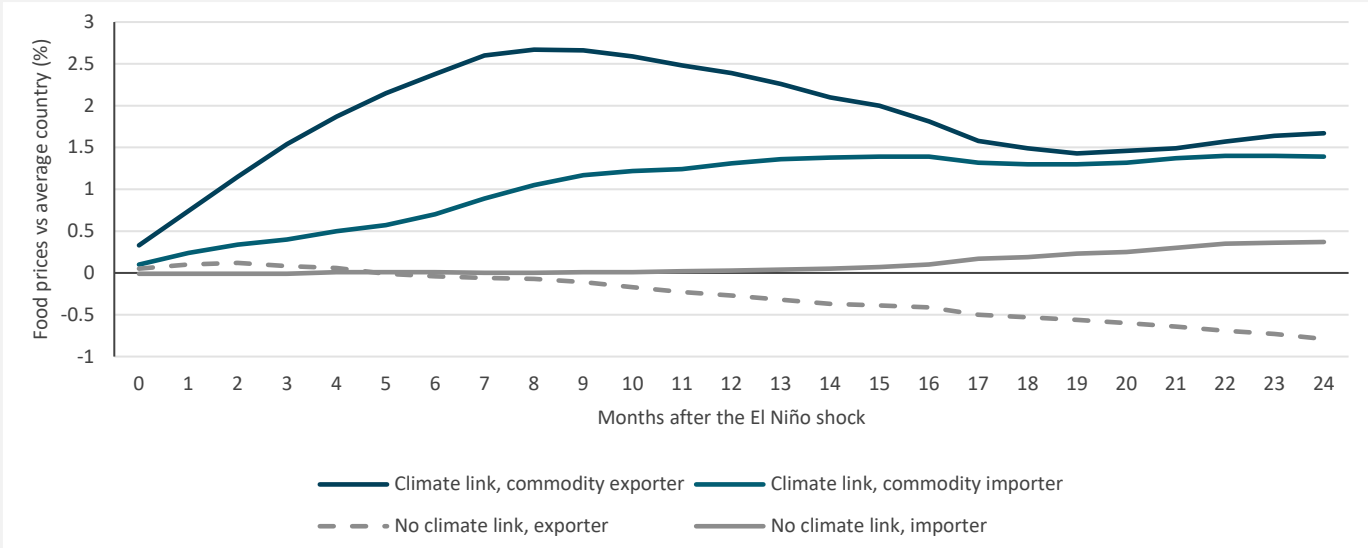
[24] "Global and Regional Scale Precipitation Patterns Associated with the El Niño/Southern Oscillation", Monthly Weather Review 115, Ropelewski, C. F. and Halpert, M. S., Aug 1987.
[25] "El Niño Temperature and Precipitation Patterns", NOAA Climate Prediction Center, 19 Dec 2005; "Ropelewski and Halpert: Contextualizing the Impacts of ENSO", IRI, Columbia University, accessed 7 Oct 2026.
[26] "Persistent effect of El Niño on global economic growth", Science 380, Callahan, C. W. and Mankin, J. S., 18 May 2023. Country values (tau_E) from the replication files: "CallahanMankin_ENSOEconomics", GitHub, accessed 8 Oct 2026.

Appendix B

Ranking model

We bring all El Niño events into a single panel data regression model to isolate any El Niño risk. Food inflation, energy inflation, real GDP growth and the change in debt/GDP are the main macro channels selected. Each of the four channels has its own panel model. Time fixed effects absorb the shock common to every country at the same time, such as the 2009 fiscal response or the 2022 inflation spike. Country fixed effects absorb each country's normal level, and lagged controls absorb its own momentum. What is left is each country's El Niño response relative to the average country.

Figure 14. Food price response to a strong El Niño (ONI 2.0) by climate link and net commodity position, relative to the average country. Source: World Bank, OECD, IMF, NOAA, AFII analysis, accessed 8 Oct 2026.



Energy inflation, real GDP growth and the change in debt/GDP use annual models that estimate a separate response for every country in the event year and the two years after, across the four strong episodes since 1990: 1991-92, 1997-98, 2015-16 and 2023-24.

Food prices need a different approach. We replace it with a monthly model as we want to see how long the inflation lasts. Rather than a separate response for each country, the response differs by two traits: whether the country has an El Niño climate link, and whether it is a net exporter or importer of non-energy commodities.

The groups differ clearly (Figure 14). After a strong El Niño, food prices in commodity exporters with a climate link rise about 2.6% relative to the average country within eight months. In importers with a climate link the rise is slower, about 1.3% after a year. Countries without a climate link show no response.

Model specification

Energy inflation, real GDP growth and debt/GDP use the same source model. For each of these factor y, country i and year t:

$$y_{it} = \alpha_i + \delta_t + X'_{i,t-1}\beta + \sum_{h=0}^{2} \theta_{i,h} C_{i,t,h} + \varepsilon_{it}$$

Here the α and δ terms are country and year fixed effects. X holds the lagged controls: real GDP growth, the change in food inflation, non-energy commodity import growth, monthly FX volatility and two lags of the outcome itself; the food model adds lagged energy inflation and the energy model lagged food inflation. C is an indicator for a strong El Niño year (1991 to 1992, 1997 to 1998, 2015 to 2016 and 2023 to 2024), entered at the event year and lags of one and two years. C interacts that indicator with country i and is centred within each year, so θ measures how far country i's response differs from the average response that year.

Only the theta coefficients are penalised, by ridge regression, which shrinks unstable country responses towards zero; the fixed effects and controls are not penalised:

$$\min_{\alpha,\delta,\beta,\theta} \sum_{i,t} (y_{it} - \hat{y}_{it})^2 + \lambda \sum_{i,h} \theta_{i,h}^2$$

The penalty is chosen separately for each outcome. Outcomes are winsorised at the 1st and 99th percentiles.[27]

Table 2. Sample and fit by channel, with and without the El Niño terms: food prices from the monthly model, the other channels from the annual source models. Source: AFII analysis, World Bank, OECD, IMF, accessed 8 Oct 2026.

Channel	Weight	Sample	Countries	Observations	Adj. R2 without El Niño	Adj. R2 with El Niño	Gain
Food prices (monthly)	40%	1991 to 2025	136	35,024	0.330	0.331	0.001
Energy inflation change	30%	1990 to 2024	75	2,084	0.182	0.209	0.027
Real GDP growth	20%	1992 to 2024	99	2,836	0.429	0.432	0.003
Debt/GDP change	10%	1992 to 2024	82	2,249	0.211	0.225	0.015

The El Niño terms add most to the energy and debt models. In the source food model the penalty was the heaviest of the four and the fit was unchanged to three decimal places, which is why the food channel is taken from the monthly model below; its row in Table 2 shows the fit of that model at a 12 month horizon.

The monthly food model

Food prices are modelled monthly with local projections on the World Bank Global Database of Inflation, extended with OECD and IMF series, for 136 countries from 1991 to 2025. For country i, month t and horizon h of 0 to 24 months:

$$y_{i,t}^h = \alpha_i^h + \delta_t^h + (Z_i'\gamma^h)E_t + (Z_i'\lambda^h)L_t + \sum_{k=1}^{12} \rho_k^h \Delta x_{i,t-k} + \sum_{k=1}^{3} \varphi_k^h \Delta x_{i,t-k}^o + \varepsilon_{i,t}^h$$

Here y is the change in the log food price index from month t-1 to t+h, net of the country's calendar month pattern, and the two sums contain 12 lags of the monthly change in food prices and 3 lags of the change in headline prices. E and L are the positive and negative parts of the ONI, so El Niño and La Niña enter separately and the response scales with strength. Z has five country traits: the climate link (1 for the strong tier, 0.5 for moderate), a net non-energy commodity exporter indicator, their product, net non-energy commodity exports as a share of GDP over 1990 to 2005 (standardised) and the fuel exporter flag. Month

[27] Crisis country-years, covering war, default, hyperinflation and domestic banking crises, are excluded unless they are strong El Niño years, and eight countries that fail coverage thresholds after that exclusion are dropped, including Argentina, Ukraine, Russia and Zimbabwe.

fixed effects absorb the common global shock, so each response is relative to the average country. Crisis country-years are excluded as in the source models, monthly changes are winsorised at the 1st and 99th percentiles, and standard errors are clustered by country.

The food inflation model sorts each country by two traits: whether it has a strong or moderate El Niño climate link, and whether it was a net exporter of non-energy commodities over 1990 to 2005. Table 3 lists the groups for the 136 countries used at the 12-month horizon.

Table 3: Country groups in the monthly food model, 136 countries at a 12 month horizon. Source: World Bank,OECD, IMF, NOAA, AFII analysis. Accessed 13 Oct 2026

Group	Number	Countries
Climate linked exporter	36	Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Eswatini, Ethiopia, Fiji, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Lao PDR, Madagascar, Malawi, Malaysia, Mauritius, Mongolia, Namibia, Nicaragua, Paraguay, Seychelles, Solomon Islands, South Africa, Sudan, Suriname, Tanzania, Thailand, United States, Uruguay, Viet Nam
Climatelinked importer	27	Afghanistan, Bangladesh, Bhutan, Botswana, Cabo Verde, Cambodia, China, Dominica, Dominican Republic, Grenada, Hong Kong SAR, China, Japan, Kiribati, Korea, Rep., Lesotho, Maldives, Mexico, Pakistan, Philippines, Rwanda, Samoa, Singapore, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Tonga, Trinidad and Tobago
Unlinked exporter	22	Aruba, Bahrain, Belgium, Bulgaria, Chad, Denmark, Equatorial Guinea, Finland, France, Guinea, Hungary, Iceland, Ireland, Kyrgyz Republic, Latvia, Liberia, Mauritania, Morocco, Netherlands, Serbia, Sweden, Togo
Unlinked importer	37	Albania, Algeria, Armenia, Austria, Belarus, Bosnia and Herzegovina, Croatia, Cyprus, Czechia, Egypt, Arab Rep., Estonia, Gambia, The, Georgia, Germany, Greece, Israel, Italy, Jordan, Lebanon, Lithuania, Luxembourg, Macao SAR, China, Malta, Montenegro, North Macedonia, Poland, Portugal, Romania, San Marino, Sierra Leone, Slovak Republic, Slovenia, Spain, Switzerland, Tunisia, United Kingdom, Kosovo
Fuel exporter (excluded from group responses)	14	Azerbaijan, Brunei Darussalam, Cameroon, Congo, Rep., Gabon, Kuwait, Mozambique, Nigeria, Norway, Oman, Qatar, Saudi Arabia, Timor-Leste, United Arab Emirates

Appendix C

Scoring and the climate link

Each country is scored 0 to 100 on each channel by percentile. The composite gives food prices 40% of the weight, energy 30%, growth 20% and debt 10%. A country needs three of the four channels to be ranked, with the weights renormalised, which leaves 91 sovereigns compared to the initial sample of 184 countries. These still cover the largest borrowers in the sovereign markets, and close to 100% of sovereign bonds outstanding.

For energy, growth and debt, a country's El Niño effect is the mean absolute fitted El Niño response over its event-window years W, that is the event year and the two years after each episode:

$$e_{c,i} = \frac{1}{|W_i|} \sum_{t \in W_i} \sum_{h=0}^{2} \left| \theta_{c,i,h} C_{i,t,h} \right|$$

The food effect is the monthly scores of Appendix B. Each effect is converted to a percentile score P from 0 to 100 within the ranked universe, and the composite is the weighted average over the channels the country has, with weights of 0.4 for food, 0.3 for energy, 0.2 for growth and 0.1 for debt:

$$S_i = \frac{\sum_c w_c P_{c,i}}{\sum_c w_c}$$

A country needs three of the four channels where the score is reweighed for the remaining channels. Countries that less than three channel are not included in the model. This avoids one factor dominating the overall linkage when it is not clear.

Appendix D

Full ranking of the 91 sovereigns

Table 4 lists all 91 sovereigns in our sample by El Niño risk score, before the climate link flag aplied. For each it gives the climate link tier, public debt outstanding in US dollars and as a share of GDP, the rank by debt among the 91, the number of the four channels modelled, and, for the 53 countries with a climate link, their climate-linked rank (shaded). The climate-linked rank is the headline ranking this report discusses. It rescores the 53 against each other. The first column, greyed, ranks all 91 on their macro response in El Niño years, whether or not El Niño reaches their climate, and is shown for reference only. Before the mask the score already follows the climate link. Nineteen of the top 20 have one; the exception, Nigeria at 12th, is in the weak tier, and the first country with no link at all is the Kyrgyz Republic at 29th.

Table 4. All 91 sovereigns ranked by El Niño risk score, with climate link tier, public debt and climate-linked rank. Source: AFII analysis, World Bank, IMF, Accessed 8 Oct 2026.

Rank (all 91)	Country	Region	Climate link	Risk score	Public debt (USD bn)	Debt to GDP (%)	Debt rank	Channels	Climate-linked rank
1	Indonesia	East Asia	Strong	87.9	547.5	39	12	4	1
2	Ecuador	Latin America	Strong	83.1	46.2	43	46	3	3
3	Grenada	Latin America	Strong	80.3	1.0	73	89	3	11
4	Lesotho	Sub-Saharan Africa	Strong	77.5	1.4	60	87	4	6
5	Zambia	Sub-Saharan Africa	Strong	76.3	29.1	115	53	3	12
6	Brazil	Latin America	Strong	76.2	1,789.2	82	6	3	2
7	Kenya	Sub-Saharan Africa	Strong	75.5	79.0	66	33	3	9
8	Namibia	Sub-Saharan Africa	Strong	74.8	9.2	68	74	4	7
9	El Salvador	Latin America	Strong	74.5	37.4	107	50	4	4
10	Jamaica	Latin America	Strong	74.4	15.9	74	61	4	8
11	Madagascar	Sub-Saharan Africa	Strong	72.3	8.9	50	75	3	10
12	Nigeria	Sub-Saharan Africa	Weak	71.7	125.3	50	30	4	
13	Colombia	Latin America	Strong	70.3	299.4	71	18	3	5
14	Tonga	East Asia	Strong	68.4	0.3	44	91	3	18
15	Trinidad and Tobago	Latin America	Strong	65.5	16.5	64	59	3	23
16	Fiji	East Asia	Strong	64.7	4.6	77	82	4	14
17	Thailand	East Asia	Moderate	64.6	327.5	62	17	4	22
18	Seychelles	Sub-Saharan Africa	Moderate	63.0	1.3	58	88	3	35
19	Malaysia	East Asia	Strong	62.6	272.6	65	19	4	13
20	Nicaragua	Latin America	Strong	61.9	7.7	39	77	4	15
21	Cabo Verde	Sub-Saharan Africa	Moderate	61.2	2.9	114	84	3	33
22	Uruguay	Latin America	Strong	59.9	53.8	65	42	4	16
23	Australia	East Asia	Strong	59.7	646.4	37	11	4	21
24	Gabon	Sub-Saharan Africa	Weak	59.7	13.7	71	65	4	
25	Mexico	Latin America	Strong	58.5	920.2	50	9	3	25
26	United States	North America	Moderate	58.5	33,917.8	116	1	3	39
27	St Vincent and the Grenadines	Latin America	Strong	58.1	0.9	88	90	4	24
28	Costa Rica	Latin America	Strong	57.7	57.8	60	38	3	30
29	Kyrgyz Republic	Europe and C. Asia	None	57.5	7.0	39	79	3	
30	Senegal	Sub-Saharan Africa	Weak	56.7	36.6	114	51	4	
31	Panama	Latin America	Strong	56.2	49.0	57	45	4	17
32	Ethiopia	Sub-Saharan Africa	Strong	55.6	52.6	39	43	4	20
33	India	South Asia	Strong	55.0	2,024.0	54	5	4	19
34	Rwanda	Sub-Saharan Africa	Strong	54.3	8.4	61	76	3	42
35	Dominican Republic	Latin America	Strong	53.3	57.3	46	39	4	32
36	Botswana	Sub-Saharan Africa	Strong	53.2	4.4	22	83	4	34
37	Chile	Latin America	Strong	52.7	137.1	42	28	4	29
38	Bolivia	Latin America	Strong	52.4	55.4	101	41	4	26
39	Canada	North America	Moderate	50.8	1,455.8	64	7	4	37
40	Singapore	East Asia	Strong	50.1	961.3	168	8	4	38
41	Mauritius	Sub-Saharan Africa	Moderate	49.1	13.6	91	66	4	40
42	South Africa	Sub-Saharan Africa	Strong	48.6	332.0	83	16	3	31
43	Belarus	Europe and C. Asia	None	48.2	27.0	39	54	3	
44	United Kingdom	Europe and C. Asia	None	47.5	4,831.4	131	4	4	
45	Guatemala	Latin America	Strong	46.8	32.0	28	52	4	28
46	Tanzania	Sub-Saharan Africa	Strong	46.3	38.2	48	48	4	27

SOVEREIGNS AND CENTRAL BANKS

Rank (all 91)	Country	Region	Climate link	Risk score	Public debt (USD bn)	Debt to GDP (%)	Debt rank	Channels	Climate-linked rank
47	Bulgaria	Europe and C. Asia	None	45.8	26.7	24	55	4	
48	Czechia	Europe and C. Asia	None	45.3	152.0	44	26	4	
49	Georgia	Europe and C. Asia	None	45.2	13.7	40	64	4	
50	Hungary	Europe and C. Asia	None	44.9	182.7	82	25	4	
51	Vietnam	East Asia	Moderate	44.7	141.8	39	27	3	44
52	Hong Kong	East Asia	Moderate	44.6	66.4	17	36	3	47
53	Mozambique	Sub-Saharan Africa	Strong	44.4	16.3	72	60	3	36
54	Niger	Sub-Saharan Africa	Weak	44.2	9.3	47	73	4	
55	Kuwait	Middle East	None	43.9	4.9	3	81	4	
56	North Macedonia	Europe and C. Asia	None	43.7	10.3	61	71	4	
57	Albania	Europe and C. Asia	None	43.6	13.5	50	67	3	
58	Qatar	Middle East	None	42.9	88.3	41	31	4	
59	Belize	Latin America	Strong	42.8	2.0	61	85	4	41
60	Gambia	Sub-Saharan Africa	Weak	42.7	1.8	73	86	3	
61	Oman	Middle East	None	42.7	38.0	36	49	4	
62	Maldives	South Asia	Strong	41.8	9.5	134	72	4	43
63	Saudi Arabia	Middle East	None	40.1	374.7	30	14	4	
64	Romania	Europe and C. Asia	None	39.2	209.4	55	23	4	
65	Croatia	Europe and C. Asia	None	37.9	52.6	57	44	4	
66	Pakistan	Middle East	Strong	37.1	260.5	70	21	4	45
67	South Korea	East Asia	Moderate	35.9	896.7	48	10	3	49
68	New Zealand	East Asia	Moderate	35.8	135.9	52	29	4	50
69	China	East Asia	Moderate	35.7	16,543.4	88	2	4	48
70	Israel	Middle East	None	35.6	360.4	66	15	4	
71	Moldova	Europe and C. Asia	None	35.2	6.8	38	80	3	
72	Paraguay	Latin America	Strong	34.9	17.1	38	58	4	46
73	Poland	Europe and C. Asia	None	34.3	413.4	45	13	4	
74	Jordan	Middle East	None	31.9	56.2	96	40	4	
75	Azerbaijan	Europe and C. Asia	None	31.7	15.5	21	62	4	
76	Benin	Sub-Saharan Africa	Weak	31.6	11.6	54	70	4	
77	Mali	Sub-Saharan Africa	Weak	31.3	12.9	52	68	3	
78	Togo	Sub-Saharan Africa	Weak	29.9	7.5	71	78	4	
79	Japan	East Asia	Moderate	29.6	8,419.2	201	3	4	51
80	Burkina Faso	Sub-Saharan Africa	Weak	29.4	14.9	64	63	3	
81	Tunisia	Middle East	Weak	28.2	42.7	83	47	4	
82	Philippines	East Asia	Strong	27.6	263.4	57	20	4	52
83	Denmark	Europe and C. Asia	None	25.5	85.9	20	32	4	
84	Kazakhstan	Europe and C. Asia	None	25.4	72.7	25	35	4	
85	Cameroon	Sub-Saharan Africa	Weak	25.3	19.0	39	57	4	
86	Cambodia	East Asia	Moderate	23.9	12.3	27	69	4	53
87	Bahrain	Middle East	None	23.9	63.3	134	37	4	
88	Iceland	Europe and C. Asia	None	19.3	19.9	60	56	4	
89	Switzerland	Europe and C. Asia	None	14.6	216.1	22	22	4	
90	Sweden	Europe and C. Asia	None	11.5	208.3	34	24	3	
91	Norway	Europe and C. Asia	None	11.4	74.5	15	34	4	

Appendix E

Table 5. Debt/GDP (%) (LHS) and Fiscal Balance (% GDP) (RHS) comparison 2014-2017 and 2023-2025. Source: A Cross-Country Database of Fiscal Space, World Bank Group, sourced 12 Oct 2026.

Country	2014	2015	2016	2023	2024	2025
Indonesia	24.9	24.6	28.0	39.6	40.2	41.0
Philippines	39.7	37.4	37.4	56.5	56.6	59.4
India	68.0	67.6	69.8	85.0	84.8	84.1
Thailand	42.6	41.7	41.7	62.2	62.9	64.7
Malaysia	55.7	55.4	55.8	69.7	69.8	70.7
Brazil	61.6	71.7	77.4	84.0	87.0	93.3
Mexico	44.1	47.1	55.0	52.8	59.1	61.8
Peru	23.7	23.9	23.9	32.4	32.1	30.2
Colombia	37.6	43.3	49.9	55.4	61.0	59.9
Ecuador	28.2	36.4	46.1	54.5	54.1	54.4

Country	2014	2015	2016	2023	2024	2025
Indonesia	-1.8	-2.7	-2.6	-1.6	-2.3	-2.9
Philippines	1.3	0.1	-0.7	-4.4	-4.4	**-4.0**
India	-6.9	-7.3	-7.2	-8.4	-7.9	**-7.4**
Thailand	-0.7	0.2	0.4	-1.9	-1.3	-1.9
Malaysia	-2.6	-2.5	-2.6	-4.1	-3.4	-3.5
Brazil	-6.3	-9.3	-8.0	-7.7	-6.2	**-8.1**
Mexico	-4.4	-3.9	-2.7	-4.3	-5.8	-4.9
Peru	-0.2	-2.0	-2.1	-2.7	-3.5	-2.4
Colombia	-1.7	-3.5	-2.3	-2.9	-6.0	**-5.7**
Ecuador	-8.1	-6.9	-10.3	-3.5	-1.3	-2.9

Appendix F

Scenario analysis

The scenarios set the peak of the ONI, the traditional three month El Niño intensity levels at 2.6 (base) and 3.0 (severe), around December 2026. The base case is a repeat of same severity as 2015-2016 . The severe case matches the CPC's September outlook, whose central path peaks near 2.65 on the relative index (RONI) the CP. Forecasts range from about 2.5 to 3.7, so both cases sit in the lower half of that range by design.[28]

The food model gives each group's price response L(h) per unit of ONI, h months after the peak, and the scenarios scale it linearly by the peak O. The change in annual inflation is then:

$$\Delta\pi_i(h) = O \times \big(L_i(h) - L_i(h-12)\big)$$

with the second term zero for the first 11 months. A price rise that builds over the first year passes one for one into annual inflation, and inflation runs below normal in the second year as the rise drops out of the comparison.

These values are relatives to the average country, and each country takes its group's response. A global rise in food prices from El Niño will add to the base, and countries within a group will differ in ways the model cannot see. Debt/GDP is not projected: the source model has no strength term, and a re-estimate with ONI strength found no reliable pattern by climate link or commodity position.

[28] "ENSO Diagnostic Discussion, September 2026", NOAA Climate Prediction Center, 10 Sep 2026; "ENSO: Recent Evolution, Current Status and Predictions", NOAA Climate Prediction Center, 5 Oct 2026 (NCEP CFSv2 near 2.1 to 2.2 relative, about 2.5 traditional); "Sea-surface temperatures reflect strengthening El Niño", World Meteorological Organization, 8 Oct 2026 (about 3.7 for October to December).

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