

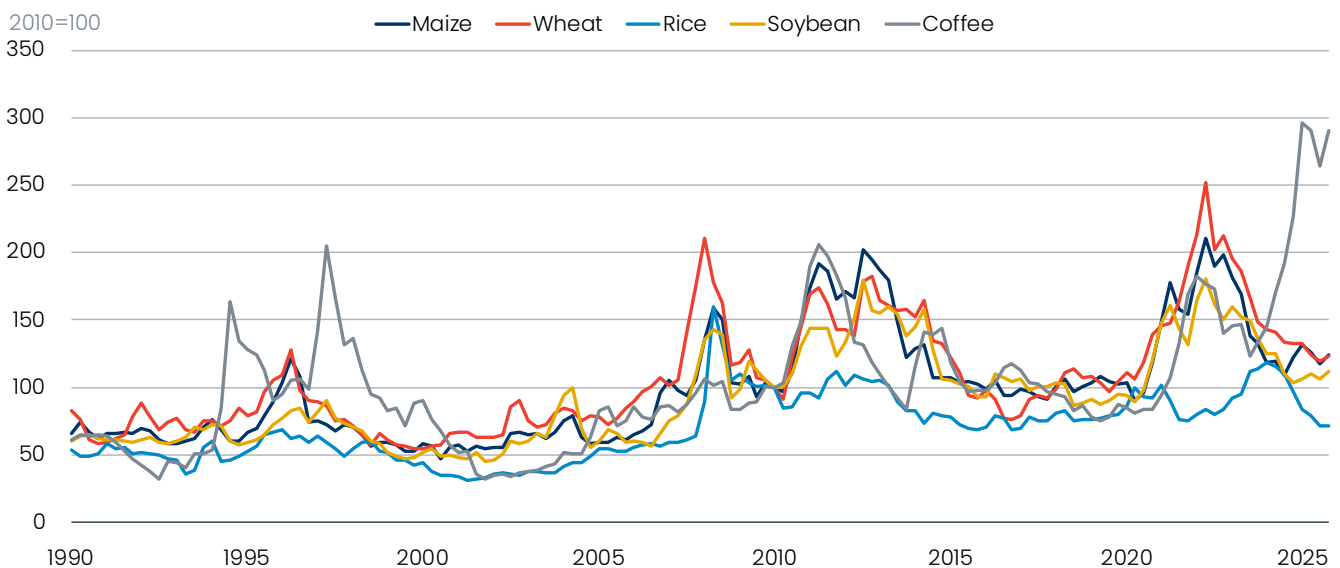
Food price inflation in a warming world

- Climate change is leading to more severe and frequent extreme weather events, which in turn lead to higher food and headline inflation. Nature-loss and the degradation of ecosystems exacerbate these effects and are likely to increase the severity of impacts from future extreme weather events.
- We model a global climate-led food price shock and find that amongst G7 economies a severe shock would have the largest impact in Eurozone, increasing the level of food prices by 1.6 ppts. If this was to occur in the next quarter, average annual food price inflation would reach 4.5%, up from 2.9%.
- Food price inflation passes through to headline inflation which would increase by 0.3ppts-0.6ppts. Most of the impact comes from the direct costs of rising food prices, as opposed to second-round effects on wages, which make a relatively smaller contribution to headline inflation following a shock.
- Importantly, food price shocks have high levels of persistence, and the impacts can last up to two-and-a-half years. High persistence contributes to compounding impacts, where consecutive annual events can increase the severity of shocks by up to 75% relative to a one-off event.
- In our baseline forecast, the world temperature anomaly is on a pathway to reach 2°C by 2050. On this trajectory, food price inflation will put stress on economies already facing long-term headwinds. To manage these risks, food price shocks should be considered as part of climate and nature stress testing, scenario analyses, and risk management exercises.

Climate change and nature-loss are increasingly [contributing to food price inflation and volatility](#), presenting a long-term risk to economies. Prior to the US war with Iran, elevated volatility and rises in global agricultural commodity prices had caught the attention of policymakers and consumers alike ([Chart 1](#)).

Chart 1: Volatility in crop prices has been higher over the past decade

Global: Agricultural commodity prices



Source: Oxford Economics/Haver Analytics

Several factors explain this phenomenon including geopolitical tensions, rising global demand, and supply chain stress (see our previous research [here](#) and [here](#)). However, climate change and nature-loss are also increasingly acting as long-term stressors on agricultural markets. [Recent research](#) has found at least 14 cases of local or regional price spikes since 2022 linked to unprecedented extreme weather events. Global coffee prices, for example, rose 55% between 2023 and 2024 due to drought in Brazil and global cocoa prices rose 280% following heatwaves in Ghana and the Ivory Coast.

Climate change-driven food price shocks are tangible examples of physical risks to the economy. This is of particular concern as climate change is leading to more frequent and severe weather shocks in the form of floods, droughts, cyclones, and wildfires. Alongside climate change, the [depletion of natural capital](#) is likely to further amplify these risks, caused by a sustained decline in ecosystems around the world. Declines in soil quality and rising levels of water stress, for example, exacerbate droughts and wildfires, leading to more prolonged and severe harvest failures.

Assessing the impact of climate change-related events on world food prices

To estimate the impact of climate-related weather events on world food prices we use a two-stage approach. First, we analyse the full historical distribution of world prices and look at the standard deviation and higher percentiles (95th) to model a 'typical' and 'severe' price shock. These amount to a 11% and 23% quarterly world food price shock, respectively.

Second, to model the persistence and time profile, we analyse price-level changes between 1972 and 2025 and identified 14 historical weather-related events that do not coincide with wider economic shocks as proxies for true global food price shocks. This follows established approaches in macroeconomic research which estimate the effects of unexpected changes in monetary and fiscal policy using narrative-based events (See the [Appendix](#) for the full methodology).

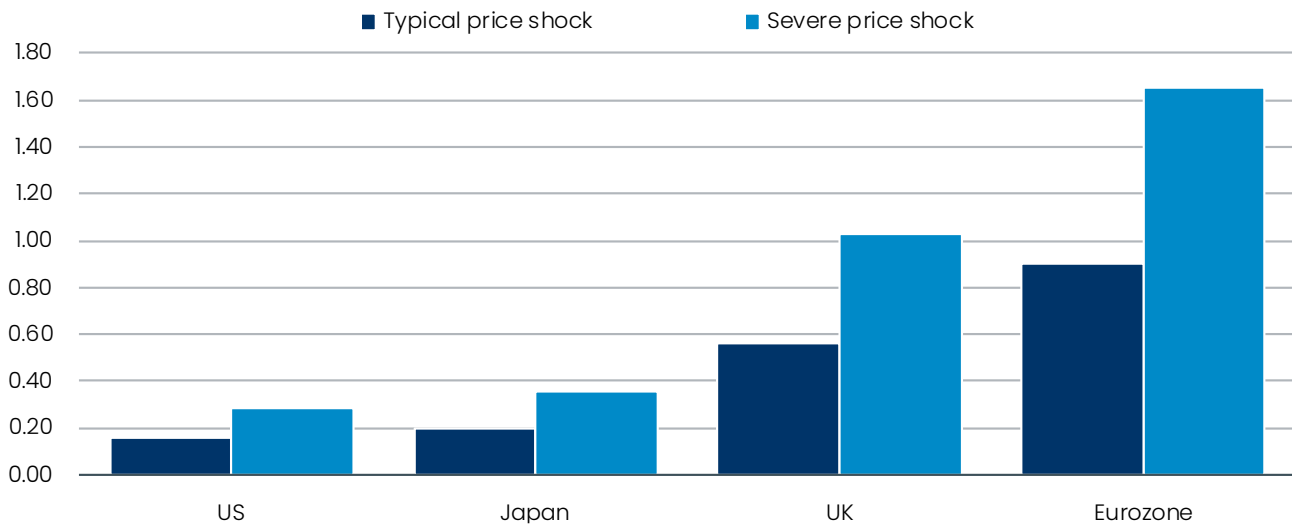
Looking at the impact on key G7 economies, our results indicate food commodity price shocks immediately transmit to higher food inflation ([Chart 2](#)). We find that the food price shock would be largest in the Eurozone (1.6 ppts) and UK (1ppts). If this was to occur this quarter, it would translate to average annual food price inflation for 2026 reaching 4.5% in both the Eurozone and UK.

The impact is more muted in the US (0.28ppts) and Japan (0.35ppts) in a severe shock scenario. These cross-country differences can in part be explained by the relative passthrough of costs from commodity prices to food price inflation. For example, the Eurozone and UK have higher sensitivity to global food commodity market prices relative to the US, which could be due to levels of domestic production and the relative costs of other inputs into food production.

Chart 2: Climate change-related food price shocks can be sizeable but vary across countries

Global: Food component of CPI, 2026

Percentage point change from baseline



Source: Oxford Economics/Haver Analytics

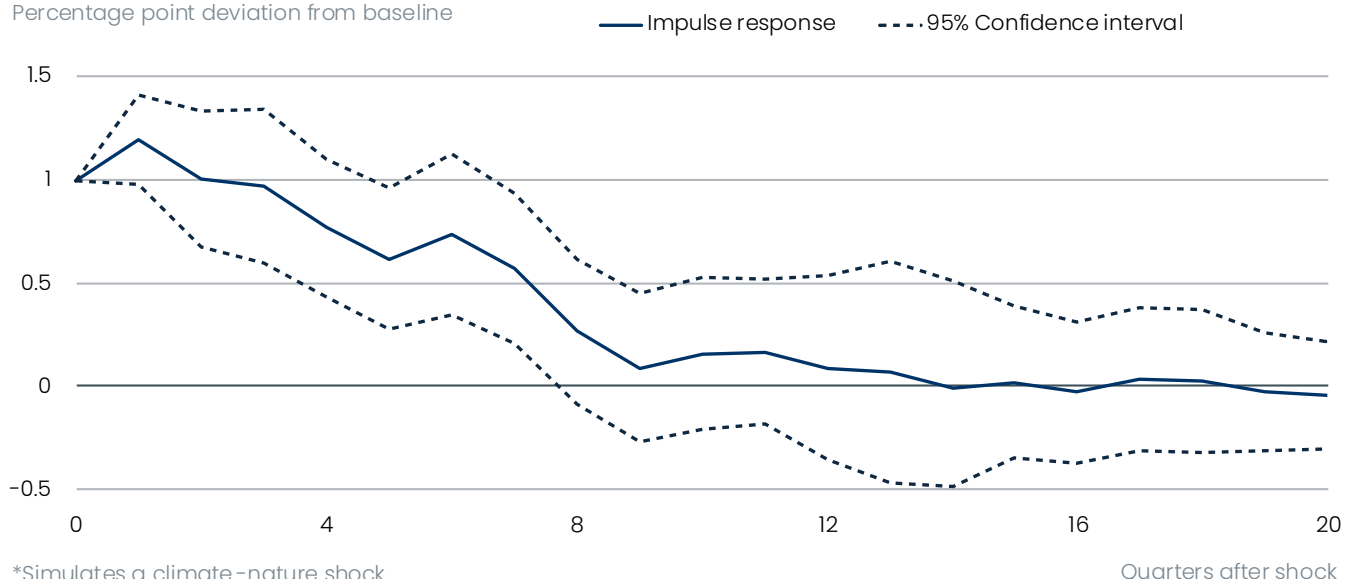
Chart 3 shows the response of world commodity prices caused by a typical weather-related shock. We find that food price inflation exhibits high persistence following a shock. It takes two-and-a-half years to return to the pre-shock trend – a striking finding given it represents the fallout from a one-off event. As physical risks from climate change and nature-loss are expected to occur on a more frequent basis, the high level of persistence leads to compounding effects, where the fallout from the first shock has not subsided when the second shock occurs.

Our analysis shows that two concurrent annual shocks – for example consecutive harvest failures in major breadbaskets – could increase the size of the second shock by up to 75%. This could lead to a 3.3ppts increase in the level of food prices in the Eurozone and raise the rate of food price inflation to 6% by the end of next year compared to 4.5% in a one-off event.

Chart 3: Food prices remain elevated for two-and-a-half years after a climate change-led shock

Global: Average world food price index response*

Percentage point deviation from baseline



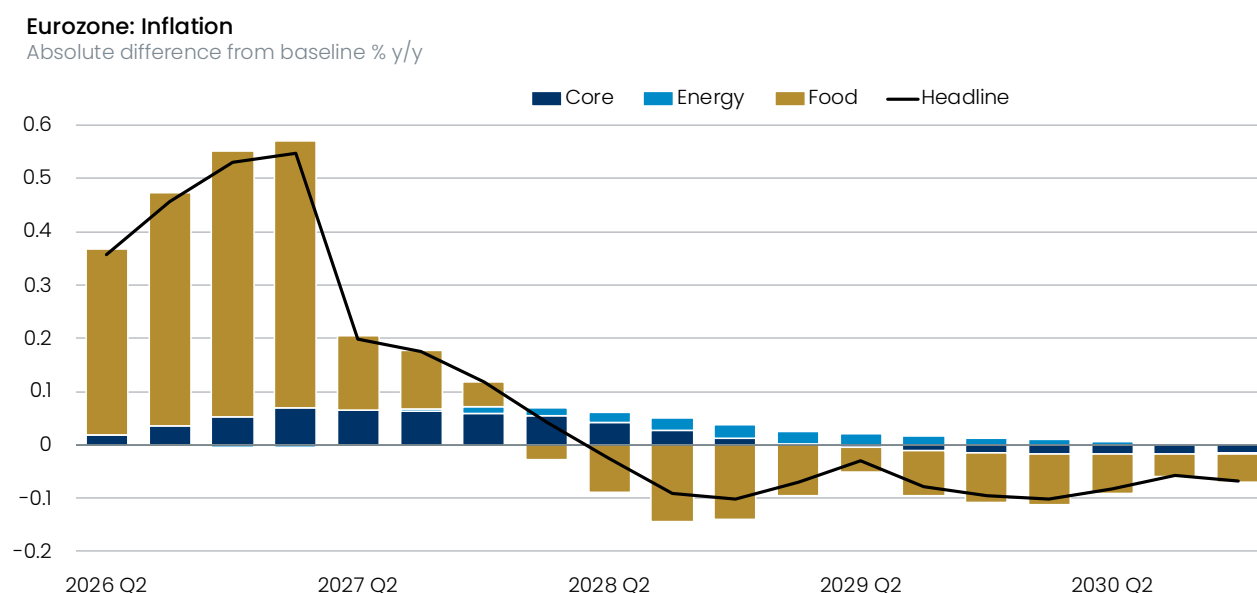
Source: Oxford Economics/Haver analytics

Food price inflation has strong pass through to headline inflation in the Eurozone

Regarding the substantial impact on Eurozone economies, we find that food price shocks are immediately transmitted to headline inflation, which make up 20% of the headline inflation basket. Under a severe price shock scenario, headline inflation increases by between 0.3ppts-0.6ppts by 2026 Q4 ([Chart 4](#)). Beyond the immediate impact, food price shocks indirectly raise headline inflation through second round effects.

[Previous evidence](#) suggests food prices play an outsized role in shaping inflation expectations, leading to the possibility of broad-based inflationary pressures from food price shocks. However, our analysis suggests food prices lead to only modest second-round impacts on headline inflation. To illustrate the point, core inflation, an indicator of these second-round impacts, increases by only 0.1ppts in the Eurozone following the shock.

Chart 4: Headline inflation rises on the back of a climate change-led food price shock



Sources: Oxford Economics, Haver Analytics

Climate and nature-related risks transmitting to the economy

Climate change is leading to a warmer and more volatile world. In our baseline forecast for the global economy, the world temperature anomaly is expected to reach 1.6°C by 2035 and stay just under 2°C by 2050, breaching the more stringent 1.5°C limit of the Paris Agreement. As the world crosses these temperature thresholds, physical risks will contribute to a higher global risk profile for the world economy, which is already navigating rising geopolitical tensions, trade wars, and high public debt.

More frequent and severe droughts, floods or wildfires, can be viewed as acute short-term shocks raising global agricultural commodity prices and transmitting through food prices to headline inflation. Compounding events and the sustained trends in the loss of nature would likely amplify the impact. The scale of the pricing impacts we found suggest the agricultural and food price channel deserves particular attention in climate stress testing, scenario analysis, and risk management exercises. This complements longer-term scenario analysis, where physical risks are captured by our [climate damage function](#).

Appendix

To quantify the impact of weather shocks on food prices, we follow a two-stage approach. First, we assume price shocks are either the standard deviation (a typical shock) or 95th percentile (a severe shock) of the historical quarter-on-quarter change in the World Bank's food price index. Second, to model the time profile, we look at the impact of historical weather events on agricultural commodity prices. [De Winne and Peersman \(2016\)](#) identify 13 historical weather events which disrupted agricultural commodity markets independently of wider economic events. We update this approach and add an additional more recent event in 2018 (see [Table 1](#)). This enables us to identify exogenous variations in commodity prices that are purely attributable to weather. Examples include the [2018 drought across Central and Eastern Europe](#), and the 2010 [wildfires in Russia](#) and [floods in Pakistan](#).

Specifically, we estimate the following equation:

$$z_t^h = \alpha^h + l^h(L)z_{t-1} + y^h(L)X_{t-1} + Q^h WPF_{FOOD}_t + \varepsilon_t^h$$

Where t is the time period, h is the quarterly time horizon in relation to t , z is the world food price index, α^h is a vector including a constant and a time trend, l^h contains the lags of the dependent variable, y^h is a set of control variables (real GDP, real consumption, policy rate, world commodity prices, fertiliser prices) and Q^h is the estimated response to a shock in real food commodity prices as defined by historical events.

Table 1: Historical weather and nature-related agricultural shock events

DATE	PRICE CHANGE	WEATHER EVENT	DESCRIPTION
1973 Q3	Increase	Drought, Monsoon failure	Poor weather in the Soviet Union led to weaker harvest. Monsoon failure in South-East Asia led to lower rice production. These both coincided with El Niño-related disruptions.
1975 Q2	Decrease	Favourable harvest	Upward revision of global grain output owing to strong harvest in the US.
1975 Q4	Decrease	Favourable harvest	Record rise in crop yields due to favourable monsoon season in India, Japan and Thailand.
1977 Q3	Decrease	Favourable harvest	Expectation of record US and Soviet grain harvests.
1977 Q4	Increase	Drought and water stress	Grain production turned lower than expected due to water stress and drought.
1984 Q3	Decrease	Favourable harvest	Strong harvests in North America and Western Europe, reflecting favourable weather.
1988 Q4	Decrease	Favourable harvest	Anticipation of a significant increase in global wheat production.
1995Q3	Increase	Drought	Significant downward revision for wheat and grain production in the US Midwest, Europe, and Australia.
1996 Q3	Decrease	Favourable harvest	Positive outlook for global cereal production based on favourable weather conditions.
2002 Q3	Increase	Drought	Reduced estimates for global cereal output due to adverse weather conditions in North America, Australia, India, coinciding with the El Niño cycle.
2004 Q3	Decrease	Favourable harvest	Upward revision to world cereal production expectations triggered by favourable weather conditions across Europe, the US, China, and Brazil.
2010 Q3	Increase	Drought, wildfires, flooding	Severe droughts and wildfires in Russia and Eastern Europe, as well as severe flooding in Pakistan disrupted supply, leading to significant reductions in wheat harvests.
2012 Q3	Increase	Drought	Droughts in Russia, Eastern Asia, and US lead to significant decline in global cereal production.

DATE	PRICE CHANGE	WEATHER EVENT	DESCRIPTION
2018 Q3	Increase	Heatwave, drought	Extreme heat and low rainfall in Eastern Europe lead to contraction in grain production.

Source: Adapted from De Winne and Peersman (2016)