

ANALYSIS – The impact of extreme weather on inflation

In June and July, western Europe experienced its warmest period ever recorded. Parts of France, Spain, Germany and the United Kingdom have been hit by a severe lack of rain and widespread drought, resulting in poor harvests. Heatwaves and other extreme weather events can also affect the Swedish economy, for example if they cause food prices to rise. However, the Riksbank's analyses show no clear impact of weather shocks on inflation in Sweden.

In Europe, prices of cereals, maize, sunflowers, olive oil and certain fruits and vegetables risk rising following a hot summer with drought that has reduced harvests. Furthermore, agricultural production in South America, Asia and Africa is at risk of being affected by the recurring El Niño climate phenomenon, which is expected to peak at the end of the year. As Sweden imports many food products, there is a risk that higher food prices will drive up Swedish inflation.

Extreme weather in the form of drought can also affect waterways and lead to shocks in global trade.²⁴ It may also affect energy prices, but these effects have not been confirmed in the scientific literature. One study shows that weather phenomena caused by El Niño lead to higher and more volatile energy prices, and that these effects last for between 6 and 16 months.²⁵

Research on the effects of the weather on inflation is not conclusive

Scientific studies analysing the economic implications of the weather focus on temperature anomalies and extreme weather events, such as extremely high or low temperatures, drought and torrential rain. A study analysing the effects on prices in Germany, France, Italy and Spain between 1997 and 2023 shows that these effects vary considerably depending on the season in which the temperature deviates.²⁶ Food prices rise, for example, if the temperature is particularly high in the summer, but fall when it is high during other seasons. However, the study shows that the impact on inflation is negligible overall.

Another study notes that most countries in Europe use significantly more heating than cooling in buildings.²⁷ Warmer weather in autumn, winter and spring reduces the

²⁴For example, a study shows that the drought in the Panama Canal in 2022–2023 led to widespread delays in shipping traffic, see P. Jung, K. Kim, A. Jo and J. Cho (2025), "Panama Canal Drought and Supply Chain Disruptions in Asia–United States Trade", ADB Economics Working Paper No. 822. Another study shows that low water levels in the Rhine have been linked to significantly lower production in German industry (see M. Ademmer, N. Jannsen and S. Mösele (2000), "Extreme weather events and economic activity: The case of low water levels on the River Rhine", Kiel Institute Working Paper, No. 2155).

²⁵ See P. Cashin, K. Mohaddes and M. Raissi (2017), "Fair weather or foul? The macroeconomic effects of El Niño", *Journal of International Economics*, 106.

²⁶ See M. Cicarelli, F. Kuik, and C. Martínez-Hernández (2024), "The asymmetric effects of temperature shocks on inflation in the largest euro area countries", *European Economic Review* 168.

²⁷ See F. Lucidi, M. Pisa and M. Tancioni (2024), "The effects of temperature shocks on energy prices and inflation in the Euro Area", *European Economic Review* 166.

need to heat buildings. This could lead to lower electricity and gas prices, which would help to curb inflation. However, the authors of the study note that it is difficult to predict whether temperature anomalies will push inflation up or down.

A similar study by the ECB, which also includes developing countries, shows that higher prices for agricultural products following high temperatures lead to higher inflation in developing countries.²⁸ However, the effect is not significant in advanced economies in terms of overall agricultural prices, and therefore has no impact on inflation either. This is probably because food accounts for a smaller proportion of the inflation basket in advanced economies than in developing countries. An IMF study also shows that the effects of extreme weather, in the form of droughts and storms, drive up inflation more persistently in developing countries than in advanced economies. This is because developing countries are more dependent on agriculture, while at the same time having weaker infrastructure and poorer institutional capacity to manage and recover from shocks than advanced economies.²⁹

Sweden's food imports may be affected by global weather shocks

Sweden imports a large quantity of goods, some of which are vulnerable to weather shocks. If prices rise as a result of a global heatwave, this could, for example, lead to higher prices in Sweden as well. Indications of certain agricultural products have already risen following the hot summer in Europe in 2026, but it is unclear whether this is really due to the drought and the heat.³⁰ Futures pricing for commodities exposed to extreme weather, such as soya beans, wheat, maize and rice, does not indicate a greater price rise over the next six months than over the next month.³¹

Figure 34 shows the extent to which various Swedish food products are dependent on imports and sensitive to weather conditions. Each item is displayed as a bubble, and the size of the bubble reflects the item's weight in the CPI. Among other things, the figure shows that coffee is in the top right-hand corner, as it is a product that Sweden imports and which is highly sensitive to weather conditions. However, the food categories that are heavily reliant on imports and are very sensitive to weather conditions represent only around 2 per cent of the overall CPI basket.

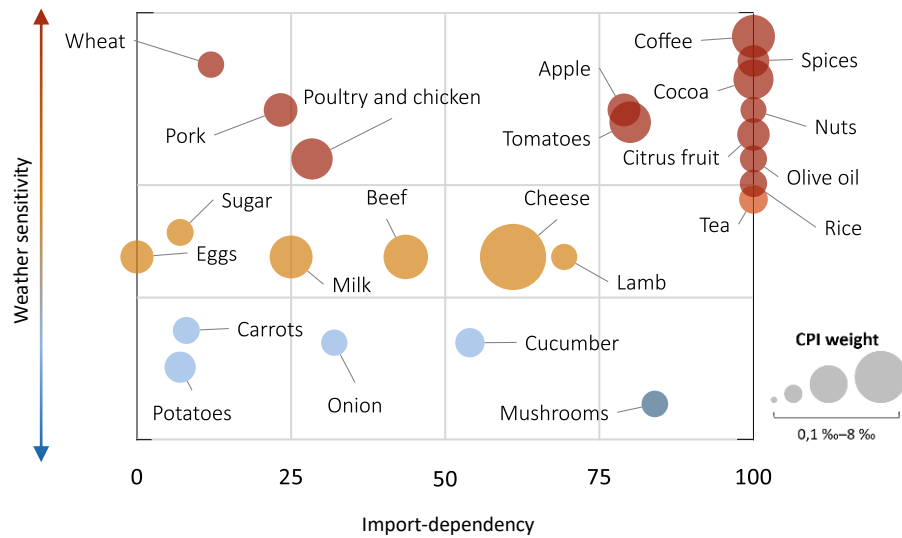
²⁸ See D. Faccia, M. Parker and L. Stracca (2021), "Feeling the heat: extreme temperatures and price stability", ECB Working Paper No 2626.

²⁹ Cevik, S., and J. T. Jalles (2023) "Eye of the Storm: The impact of climate shocks on inflation and growth." IMF Working Paper No. 2023/087.

³⁰ Prices of agricultural products are based on the Bloomberg Agricultural Index and The Economist Agriculture Food Price Index.

³¹ Futures prices for soya beans, wheat, maize and rice are data from the CME Group, Euronext and Intercontinental Exchange.

Figure 34. The import-dependency of food products and their weather sensitivity
Percentage (import-dependency) and per mille (CPI weight)



Note. The figure shows the import-dependency of food products (x-axis, import as a percentage of consumption) and their weather sensitivity (y-axis). The degree of weather sensitivity is indicated by colour, where the same colour corresponds to the same degree of sensitivity regardless of its position on the y-axis: dark blue = low, light blue = medium-low, orange = medium, darker orange = medium-high and red = high. The size of the bubbles is proportional to the product's CPI weight (per mille).

Sources: Swedish Board of Agriculture, Statistics Sweden and the Riksbank.

The Riksbank's analyses indicate that global temperature anomalies and extreme weather events do not have a direct impact on Sweden's overall CPIF inflation and food prices. However, Swedish prices for individual categories of imported goods may be affected indirectly through the impact that weather shocks have on global prices. For example, the prices of coffee, cocoa and electricity increase significantly following corresponding price rises on the global market. However, global price rises may also be driven by factors other than weather shocks. Geopolitical conflicts, changes in supply and demand, and increased energy and transport costs are examples of factors that may contribute to higher prices.

In summary, extreme weather may in the short term lead to temporary price increases for certain goods, but the impact on overall inflation is expected to be very small and only indirect in Sweden. In the longer term, however, there is a risk that climate change could lead to more frequent and severe episodes of extreme weather, which could affect the supply and prices of food and energy. This could make it more difficult to predict how inflation will develop. The Riksbank therefore monitors developments in global food and energy markets on an ongoing basis and adjusts its forecasts when necessary.