

## Raging storms, rising costs

- In early July, the Earth's average temperature set a new all-time record, shattered three times within the same week. The surge in surface temperature escalates the likelihood of extreme weather events, such as heatwaves, floods, or storms.
- The realised economic losses in the Nordic and Baltic regions have so far been relatively limited within the broader European context. Nevertheless, the greatest risks originate from external sources, such as supply chain disruptions and increased product prices.
- Extreme weather could contribute to higher inflation and prolong the current high inflation setting, making the task for central banks even trickier.

In early July, the Earth's average temperature set a new all-time record, shattered three times within the same week. At the same time, NASA [announced](#) that July of this year was the hottest month on record, since 1880. Scientists project that countries bordering the Mediterranean Sea will frequently experience heatwaves exceeding 45 degrees Celsius, with a strong likelihood that temperatures will increasingly surpass the 50-degree Celsius mark by 2100. But how will extreme weather affect us in a broader economic sense? We take a look at this in this analysis.

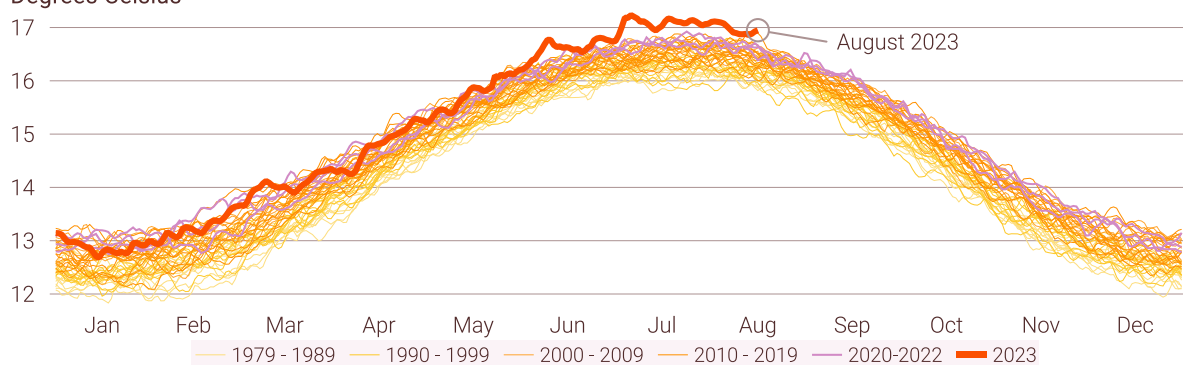
The escalation of extreme weather events affects our countries' economies, with variations seen at both regional and national levels. The cumulative direct economic losses from extreme weather events from the 1980s to 2020 reached around EUR 1500 per capita in Denmark, whereas the corresponding amount is approximately EUR 400 in Latvia, Lithuania, Finland, and Sweden.

However, when factoring in the indirect costs, the cumulative annual losses during this period exceeded 8% of Latvia's GDP in 2020. A comparison across Nordic and Baltic nations highlights that extreme weather has also substantially impacted Lithuania and Denmark. Meanwhile, for the economies of Sweden, Norway, Finland, and Estonia, the impact is considerably less pronounced.

Looking ahead, average yearly losses from natural disasters, incorporating indirect costs, could potentially double by 2040 compared to the early 2000s. Projections suggest potential losses of up to EUR 1.2 billion in Denmark, EUR 0.5 billion in Sweden, and EUR 0.3 billion in Finland.

### Global daily mean of 2-metre air temperature

Degrees Celsius



Sources: Climate Change Institute, University of Maine & Swedbank Research

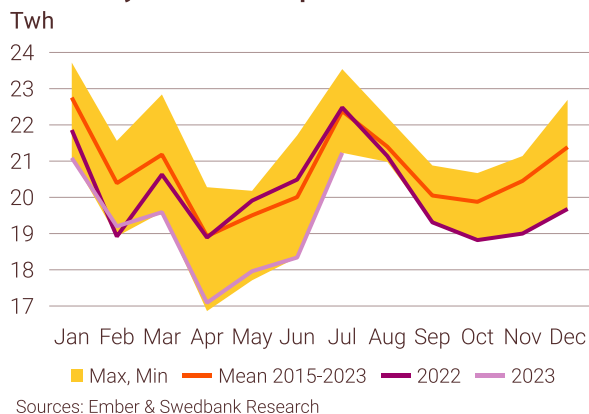
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### Summer's bewitched fury

The heatwaves that have affected Europe this summer—Cerberus and Charon—named after, in Greek mythology, the three-headed dog who guarded the gates of the underworld and the ferryman who transported the deceased, underscore the severity of the threat. Persistent heat leads to health risks, forest fires, melted asphalt, poorer air quality, lower productivity, and finally, tourists opting for colder locations.

Heatwaves also contribute to higher prices, including electricity prices. For example, in Spain, data show that electricity consumption is higher during the summer than during the winter months due to 24/7 air conditioning usage. Last year, the drought resulting from extreme heat in France diminished the amount of electricity generated by French nuclear power plants, contributing to higher energy prices. Moreover, extreme heat puts a strain on the electricity grid, leading to a decrease in transmission capacity. Lastly, some regions are experiencing water shortages due to the heat, creating additional difficulties for a number of sectors. Hence, heatwaves have a broad-based economic impact.

#### Electricity demand in Spain

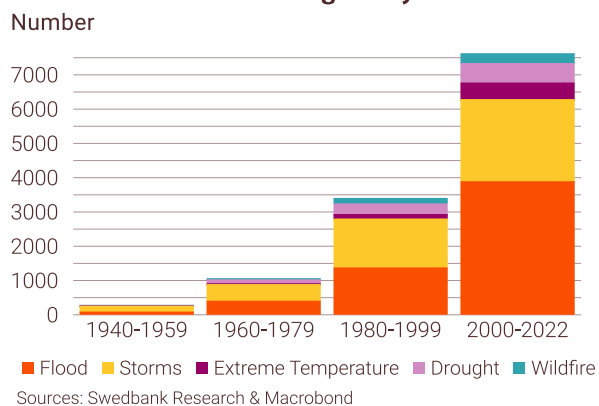


The extreme heat also impacts productivity, making work more challenging. According to a [recent report](#), high temperatures often result in slower work, increased risk-taking, and diminished cognition – all factors that reduce productivity. Additionally, there are the workdays that might need to be cancelled due to the extreme heat, both of which contribute to a decline in GDP.

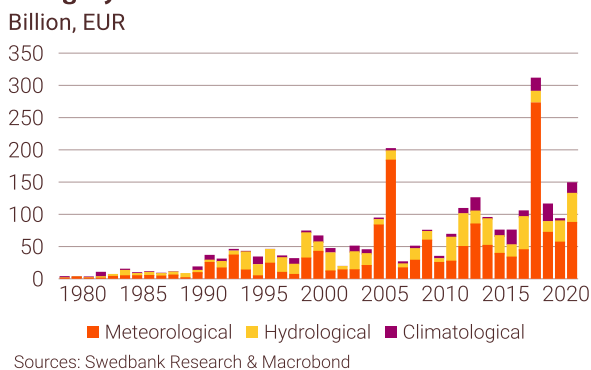
### The threat of extreme weather events on the horizon

Nonetheless, it is acknowledged that making precise predictions about the consequences of climate change is exceedingly challenging. Once the elusive tipping point is crossed, forecasting the repercussions of climate change becomes intricate. Despite the uncertainty surrounding the accurate anticipation of the frequency and severity of extreme events, it is probable that heatwaves will intensify, occur more frequently, and extend their reach to an increasing number of countries.

#### Extreme weather events globally



#### World economic costs of natural disasters by category



And this accounts for merely half of the story concerning how global warming impacts us and our economies. The probability of facing additional catastrophic events, such as storms, floods, and droughts, has markedly [risen](#) since the 1980s. In parallel, the occurrence rate of certain weather phenomena, such as floods or hurricanes, has nearly doubled since the onset of the current century.

By elevating the global surface temperature, climate change emerges as a pivotal factor shaping the occurrence, magnitude, and duration of these weather [events](#). It is estimated that the direct global costs of these extreme weather events<sup>1</sup> are constantly rising; since 2010, they have stood at around EUR 100 billion each year.

This year scientists from the US National Oceanic and Atmospheric Administration (NOAA) have also verified the onset of the El Niño phenomenon, which typically occurs every 2 to 7 years. El Niño, a climatic cycle that triggers warming in the Pacific Ocean, leads to a surge in the occurrence of extreme natural phenomena such as storms, droughts, and heavy rainfall. Climate change and the warming atmosphere elevate the risk of El Niños, resulting in more frequent, less foreseeable, and more destructive extreme natural events, as affirmed by scientists.

Hence, El Niño ushers in a fresh era of uncertainty and heightened economic peril, encompassing potential repercussions for crops, harvests, and industries, thereby influencing global commodity prices. Moreover, the likelihood of fires and other natural calamities surges as well.

With the increasing risks of climate change induced extreme weather events, developing nations—particularly those situated in hotter climates—are confronted with the most substantial vulnerabilities. [The World Risk Index](#) gauges the degree to which countries are susceptible to natural disasters and negative climate change impacts, evaluating them along three distinct dimensions, and how vulnerable society is to their effects.

The countries most susceptible on a global scale, are the Philippines, India and Indonesia. A total score ranging from 33 to 100 [indicates](#) an exceedingly high risk of being impacted by extreme disasters, as a product of exposure and coping capacities. Moreover, even the largest world economies, which play pivotal roles in global supply chains - such as China and the United States, also encounter elevated risks of experiencing these natural calamities.

### World Risk Index: natural catastrophes

Values for 2022	Score	Exposure	Vulnerability	Lack of Coping Capacity	Lack of Adaptive Capacities	Susceptibility
Philippines	46.8	40.0	54.8	55.5	57.8	15.8
India	42.3	36.0	49.8	56.3	55.4	37.3
Indonesia	41.5	39.9	43.1	47.2	50.7	51.4
Mexico	37.6	50.1	28.2	49.6	12.1	33.5
China	28.7	64.6	12.8	10.8	12.1	11.6
United States	22.7	39.6	13.1	31.2	6.2	39.5

Maximum value for a given indicator is 100. Countries chosen by high risk and global importance.

Sources: Alliance Development Works, Swedbank Research & Macrobond

In the Nordics and Baltics, the overall score is remarkably low (according to the World Risk Index, a total score of 0 – 9.90 is very low risk), which highlights that the greatest risks originate from external sources, such as disruptions in supply chains, increased product prices and migration. Notably, the lack of coping capacities is particularly evident in Lithuania and Estonia, where scores exceed 30. This suggests that these countries face challenges in terms of their ability to implement various measures and actions within their societies to mitigate the adverse effects of natural hazards.

While the risks might be higher in other geographical areas, the impacts on the Nordics and Baltics have become evident this summer. The storm named Hans resulted in a breached power plant dam and a collapsed railway bridge in Norway, along with multiple flooded cities in Sweden, posing sanitation risks

<sup>1</sup> Extreme weather events can be divided into three categories: 1) meteorological (hurricanes, typhoons, windstorms); 2) hydrological (floods); and 3) climatological (heat waves, freezes, droughts, wildfires) (Coburn, 2020).

to drinking water and a derailed high-speed train. While the storm wrought significant damage in Lithuania, with hail shattering roofs and winds uprooting trees.

### World Risk Index: natural catastrophes

Values for 2022	Score	Exposure	Vulnerability	Lack of Copi Capacity	Lack of Adap Capacities	Susceptibility
Norway	3.2	1.1	9.4	23.9	4.7	7.5
Lithuania	2.2	0.6	7.8	34.8	2.1	6.5
Latvia	2.1	0.8	5.8	11.3	2.4	7.3
Sweden	2.1	1.1	4.1	15.7	1.1	4.0
Estonia	1.8	0.4	7.7	31.3	2.1	6.8
Denmark	1.0	0.2	5.9	24.9	1.7	4.7

Maximum value for a given indicator is 100.

Sources: Alliance Development Works, Swedbank Research & Macrobond

This underscores the magnitude of the global challenge when events as significant as those observed in the Nordics and Baltics are perceived as minor. Adapting to a changing climate comes at a substantial cost. In a 2022 [report](#), the Swedish National Board of Housing Building and Planning, projected that the expenses of climate adaptation for Swedish society, focusing solely on flooding and erosion, could range between 10 – 18 billion EUR<sup>2</sup> until 2100, without even accounting for droughts and extreme heat.

### Cascading economic impact across the globe

Climate change and its ensuing escalation of diverse natural disasters impact economies of nations through various channels. For instance, storms or tornadoes can inflict harm upon buildings and infrastructure. Conversely, droughts or heavy rains can ravage crops, thus propelling a surge in food prices. Two current examples of commodities reaching all-time highs this summer is the surge in [orange juice](#) futures and [olive oil](#) prices.

Furthermore, pivotal sectors like metal [mining](#) can suffer adverse consequences from natural calamities, leading to potential hikes in automobile and construction material costs. A recent [study](#) also finds that extreme weather doesn't only affect the availability, but also the quality of some construction materials like concrete. Additionally, it's crucial not to overlook instances from the previous year when hydroelectric power plants grappled with diminished capacity due to droughts and depleted riverbeds. Consequently, electricity prices surged, while some of China's industrial operations in Shanghai and Chengdu were entirely suspended for nearly two weeks.

ECB's [analysis](#) suggest that a one-degree temperature increase during El Niño historically raised food prices by more than 6% after one year. New [research](#) suggests that food prices matter not only because they disproportionately burden low earners, but also because they have one of the highest predictive powers power for future headline inflation. Similarly, Bloomberg's [assessment](#) indicates that previous El Niño climate cycle events have played a role in driving up global inflation by adding almost 4 percentage points to commodity prices, excluding energy products. Moreover, these events exerted a substantial influence on the economic growth trajectories of specific nations, particularly emerging economies like India and Brazil.

This could also contribute to the occurrence of "stagflation," when inflation remains high despite economic contraction. Given the prevailing elevated global inflation, the El Niño phenomenon might impede not just economic rebound, but also potentially result in higher inflation in the coming years.

While quantifying the repercussions of explicit, immediate, and tangible expenses of natural disasters is relatively straightforward, assessing the impact of indirect costs, as supply-chain disruptions, or more

<sup>2</sup> 130 – 205 billion SEK

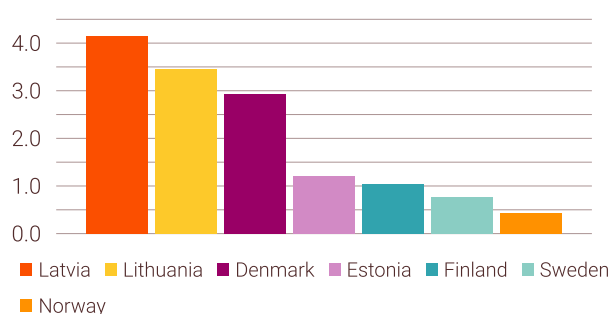
intangible costs like health and increased inequality, presents a more intricate challenge in terms of monetary measurement. Nonetheless, economic research suggests that indirect expenses could potentially amount to several times the direct costs, spanning a range from 1.5 times to over 10 times. [Research](#) indicates that a reasonable, yet still conservative, multiplier for estimations is times 2. For a deeper understanding of various economic implications, you can find more information on different costs [here](#).

### The impact on the Baltics and Nordics

The escalation of extreme weather events will affect our countries' economies, with variations seen at both regional and national levels. Thus far, the realized economic losses in the Nordic and Baltic regions, except Denmark, have remained relatively limited when compared to the broader European context. Analysing data on a per capita basis, Denmark has faced higher losses than the EA member states' average. The higher costs in Denmark are largely [related](#) to the placement of many large cities near the waterfront. While Denmark possesses the lowest risk score among the Nordics and Baltics, according to the World Risk Index, it has incurred greater costs so far. Hence, it is important to note that risk and costs are not directly interchangeable; other factors such as economic sectors, landscape and prevailing weather conditions determine how these risks materialise.

#### Cumulative losses over the period 1980 to 2020, direct costs only

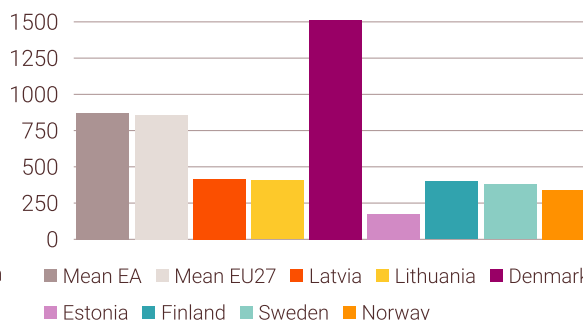
% of GDP in 2020



Sources: European Environmental Agency & Swedbank Research

#### Direct per capita losses due to weather & climate related extreme events (1980-2020)

EUR



Sources: European Environmental Agency & Swedbank Research

The cumulative direct economic losses from extreme weather events from the 1980s to 2020 reached nearly EUR 1500 per capita in Denmark (or almost 3% of its GDP in 2020), whereas the corresponding amount is approximately EUR 400 in Latvia, Lithuania, Finland, and Sweden. On average, the expense per capita for euro area countries totals EUR 870. The Baltic states face a higher proportion of GDP costs due to their relatively smaller economies. Among them, Latvia stands out, experiencing an impact of over 4% on its GDP.

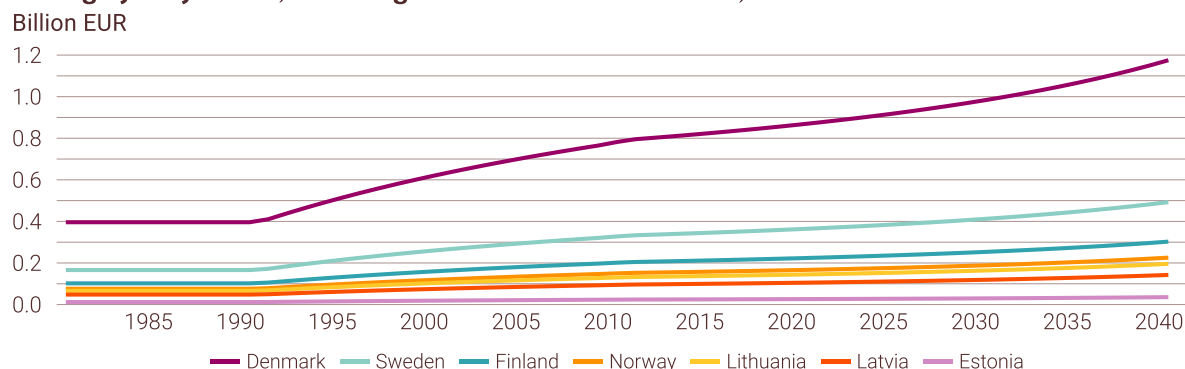
However, the actual economic losses have likely been even larger. For example, while El Niño does not directly impact Nordic or Baltic nations these are open global economies, making them especially responsive to shifts in international prices. For instance, a reduced coffee harvest in Brazil or Colombia would translate to higher coffee costs in the Nordics and Baltics. Hence, elevated raw material prices inevitably translate to costlier end products. Conversely, an industrial shutdown in China could disrupt supply chains, potentially affecting these regions.

Computing the indirect costs using the times 2 multiplier, although conservative, the cumulative economic losses including indirect costs, amounted to approximately EUR 3000 per capita in Denmark, EUR 800 in Latvia, Lithuania, Finland, and Sweden. Meanwhile, costs reached around EUR 700 in Norway and EUR 350 in Estonia.

It is estimated that global costs of extreme weather events are constantly rising. Therefore, the negative impact of extreme weather on economic growth could become even more substantial in the future.

Yearly average losses from natural disasters, including indirect costs, could double by 2040, when compared to the beginning of this century, and reach as much as EUR 1.2 billion EUR per year in Denmark, EUR 0.5 billion in Sweden, and EUR 0.3 billion in Finland. Put in relation to the projected GDP-growth, these numbers are not big. However, the times 2 multiplier for indirect costs is a conservative estimate and probably does not capture all indirect costs. Some of the effects of sudden extreme weather events can be mitigated through active adaptation. Nevertheless, it also entails a cost.

### Average yearly losses, including estimate of indirect costs, trend



Sources: Swedbank Research & Macrobond & European Environmental Agency. Trend calculated based on yearly average 1980-2020 and forecast until 2040. Indirect cost included with a multiplier of 2.

As the repercussions of climate change amplify and humanity persists in elevating its carbon footprint, the adverse outcomes will heighten and grow increasingly unpredictable with each passing year. In the end, adjusting society to climate change is about maintaining vital functions as food and energy supply, transportation capabilities and health services. These functions collectively determine how a country operates. The risks and costs of not taking action will broadly affect governments, investors, firms, and households.

However, looking at the Nordic and Baltic countries, which are progressively gaining appeal as tourist destinations during the summer due to their climate, increased tourism will have positive economic effects. As climate change impacts the global economy and the tourism sector, this trend presents an opportunity for colder destinations. While southern European locations grapple with scorching temperatures that reduce their summer appeal, Nordics and Baltics can capitalize on showcasing the benefits of colder summer climate. It seems evident that unless substantial efforts are undertaken by global leaders to address climate change, the charm of vacation destinations near the Mediterranean Sea is poised to diminish, thereby encouraging a shift to colder destinations in the upcoming summers and beyond.



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