

Heat waves cause exports to plummet worldwide

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Extreme heat causes labour productivity to fall. Supply shortfalls caused by this have an impact on global trade: Less is exported and importers have to accept the losses of affected exporters or switch to other exporters, which causes additional costs. A study by ZEW Mannheim and Frankfurt School of Finance & Management shows for the first time that substantial parts of the trade-related economic damage from heat waves occur in countries that are not directly exposed to the temperature shocks.

The researchers show that in months when a country's average temperature is at least 30° C, exports fall by an average of 3.4 percent – compared to a month when the average temperature was below this threshold. Other definitions of a heat wave also show similar results. Crucial to the extent of export decline due to climate change is the labour intensity of the goods.

"In the study, we found that the negative impact of heat on exports is most evident where trade is preceded by labour-intensive production processes," says Dr Daniel Osberghaus, Senior Researcher at the ZEW Research Unit 'Environmental and Climate Economics' and co-author of the study. Heat can reduce labour productivity and labour supply, which becomes noticeable in the form of supply declines – especially for labour-intensive products.

Even if the weather extremes occur locally at first, they affect the trade network at the global level. This is because the local decline in supply leads to evasive reactions: "Importing countries try to compensate for supply losses by purchasing goods from third countries. However, this often results in higher costs," says Osberghaus.

The researchers found that an average heat wave causes costs of around 360 million US dollars due to declining imports worldwide. "Two-thirds of these costs have to be shouldered by countries that were not directly affected by the heat," says co-author Professor Dr Oliver Schenker of Frankfurt School of Finance & Management.

The economic losses due to climate change will not decrease in the future. Based on a medium climate projection – a scenario of global climate development that is neither too pessimistic nor too optimistic – the researchers calculate the trade losses to be expected from heat waves. For the period 2020-2039, annual global trade is reduced by about 735 million US dollars compared to 2015.

However, it is also certain that a protectionist trade policy does not contribute to solving the problem, on the contrary: "It is global trade with its substitution possibilities that reduces the economic losses caused by climate change," says Schenker.