

# Research Brief

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## How do energy prices influence inflation expectations?

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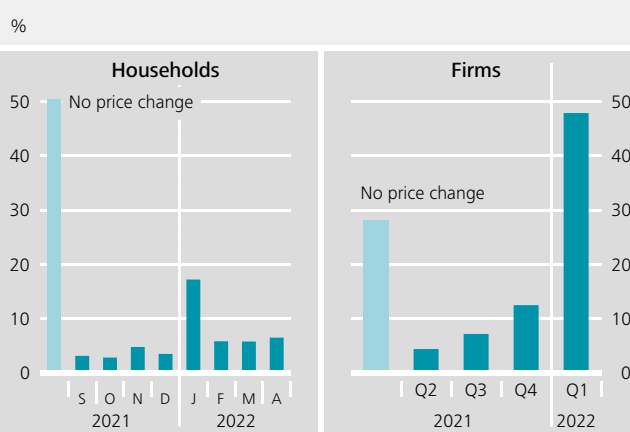
A new research paper shows that German households increase their inflation expectations following increases in their energy prices. This effect is, however, absent for high-income and well-informed households as well as for firms. Higher inflation expectations can influence saving and consumption decisions and thus aggregate demand.

Inflation has risen sharply both in Germany and globally since mid-2021. In many European countries, much of this increase in inflation can be explained by significantly higher energy prices, especially after Russia launched its war of aggression against Ukraine. A new study examines how households and firms form their inflation expectations when they experience increased energy prices (Wehrhöfer, 2023). Other research papers have shown that households use prices that they encounter often in daily life, such as supermarket prices, to form their inflation expectations (D’Acunto et al., 2021). Based on this finding, the study explores the effect of energy price hikes on the inflation expectations of households and firms. It is important for monetary policymakers to understand how households and firms form their expectations. Inflation expectations play an important role in saving and investment decisions of households and firms (D’Acunto et al., 2022; Coibion et al., 2023; Coibion et al., 2020a). As such, they influence both aggregate demand and the transmission of monetary policy in the economy.

The study uses the Bundesbank Online Panel: Households and the Bundesbank Online Panel: Firms for the analysis. In these surveys, households are asked every month and firms

Energy price increases over time for households and firms

Figure 1



Sources: Bundesbank Online Panel – Households (BOP-HH) and Bundesbank Online Panel – Firms (BOP-F).  
Deutsche Bundesbank

every quarter for their inflation expectations over the next twelve months. As both datasets are panel data sets, the same households and firms are surveyed multiple times in succession. In addition, the datasets also contain information about whether a household or firm has experienced an increase in energy prices, when it took place, and how high

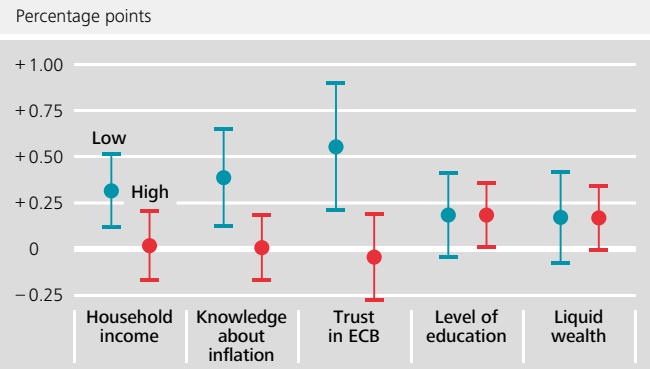
the price increase was. This makes it possible to divide households and firms into two groups. The first group had long-term contracts with energy suppliers during the sample period and was thus shielded from price increases. The contracts of the other group expired during the sample period between September 2021 and April 2022, which means that this group was affected by energy price increases. The data show that around half of households did not experience a price increase between September 2021 and April 2022 (see Figure 1). The price changes experienced by the rest of the households are evenly distributed over the sample period, with the exception of January, which is traditionally when many contracts are renewed. In contrast, only around 30% of firms experienced no price increases. Furthermore, the share of firms affected by price hikes increased significantly over time (see Figure 1).

The empirical approach used in the research paper – known as a difference-in-difference approach – compares households that experienced a price increase with other households that have not yet experienced one over time. This approach allows for the effect of price increases to be isolated from other factors. Because the same households are compared over time, it is possible to control for all factors that are constant over time. The comparison with the group not affected by the price increase makes it possible to control for other macroeconomic developments. An analogous approach is used for the firm data.

The results show that the inflation expectations of households experiencing an increase in their energy price increase significantly relative to those households that have not yet experienced an increase. The development of inflation expectations prior to the price increase is very similar for both groups and does not diverge significantly until after the price increase. This pattern over time supports the assumption that the two groups of households were comparable prior to the price increase. Following the increase in energy prices, the inflation expectations of the affected households increase significantly. However, this effect is only observed for households that experienced large increases in their energy prices. These results imply that households use their personal experience of prices to form expectations about macroeconomic price developments.

Using the extensive survey data, it is also possible to determine which population groups are most likely to rely on their personal experience when forming expectations. Figure 2 shows

**Effect of energy price increase on the inflation expectations of households for different groups<sup>\*)</sup>** Figure 2



Source: Bundesbank Online Panel – Households (BOP-HH). \* Low values are values for the respective variable below the median. Knowledge about inflation is defined as the deviation between perceived inflation and realised inflation. Deutsche Bundesbank

that this behaviour is particularly evident among low-income households that use a larger share of their income to cover energy costs. Households that are less informed about past inflation or have little trust in the ECB also tend to rely more on their personal experience of prices. By contrast, households' level of education and their liquid wealth play no major role in the formation of expectations.

Households that rely more on their personal experience form less accurate inflation expectations when compared with realised future inflation as measured by the official consumer price index, with an individualised consumer price index, or with the forecasts of professional forecasters at the time. Expectations distorted by extrapolation can have an influence on consumption decisions and thus on aggregate demand as well as wage formation (Coibion et al., 2020b).

Using the firm data, the paper also shows how managers, board members and other decision-makers in firms respond to energy price increases. As expected, firms pass on some of the increased energy costs to their customers by raising their own prices. As decision-makers in firms regularly make decisions based on their price expectations, one would assume that they rely less on their firm-specific experience and more on general market conditions to form their expectations. In fact, there is no evidence that firms that had to pay a higher energy price relative to firms that have not experienced a price increase changed their inflation expectations. This result implies that, in the context of this research paper, decision-makers within firms do not extrapolate their personal experience, but instead rely on other sources of information.

## Conclusion

The research paper shows that low-income households, in particular, form their inflation expectations on the basis of their personal experience of energy price increases, and this makes their expectations less accurate. As a result, these households experience a twofold negative effect of energy price increases: first, they spend a disproportionately high amount on energy and, second, their inflation expectations are distorted, which can affect future saving and consumption decisions. This means that energy price increases have not only a direct effect on inflation, but can also influence inflation expectations and thus, as a second-round effect, aggregate demand.

## References

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## News from the Research Centre

### Publications

"Connected Funds" by Daniel Fricke and Hannes Wilke (both Deutsche Bundesbank) will be published in the *Review of Financial Studies*.

"Precision-based sampling for state space models that have no measurement error" by Elmar Mertens (Deutsche Bundesbank) will be published in the *Journal of Economic Dynamics and Control*.

### Events

7 – 8 May 2024

"Spring Conference 2024 – Structural Changes and the Implications for Inflation" jointly organized by Danmarks Nationalbank, Norges Bank and Deutsche Bundesbank

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