

THE IMPACT OF UNCERTAINTY ON ECONOMIC ACTIVITY

In recent quarters, the backdrop to global economic activity developments has been marked by heightened uncertainty, largely associated with geopolitical events, such as tensions in the Middle East and the ongoing war in Ukraine.

The activity of economic agents always involves elements of risk and uncertainty. Households, firms and governments – when making their decisions on consumption, saving, investment, hiring, or, in the case of financial institutions, credit conditions – need to make assumptions about the future course of certain variables (e.g. the cost of energy or the demand for a specific good or service). This involves the assignment of (subjective or objective) probabilities to the potential values of these variables. And in this decision-making process, agents are aware that both domestic and global factors influence future scenarios and their probabilities of occurring.

However, when uncertainty increases very sharply, agents' decisions are distorted. Indeed, a broad set of studies shows that these spikes in uncertainty may adversely affect agents, inhibiting or reducing their purchases or investments, thus having a negative impact on economic activity as a whole.¹

Since it is not an observable variable, economists attempt to measure uncertainty using various alternative empirical measures. For example, some standard measures of economic uncertainty use observed stock market

volatility,² the VIX index,³ the dispersion of professional or business forecasts,⁴ the common variability of unforecastable components in econometric models,⁵ or forecast errors computed on the basis of real-time statistical models.⁶

There are also geopolitical risk indicators based on the frequency with which terms relating to geopolitical events appear in the press.⁷ Other authors measure uncertainty linked to the future course of economic policy by means of textual analysis (see the Economic Policy Uncertainty (EPU) Index),⁸ which has also been adapted to the case of Spain.⁹ Finally, other studies use the subjective responses of economic agents to questions regarding how they perceive uncertainty to approximate this concept.¹⁰

With regard to the latest evidence on global uncertainty developments, the signals emerging from these indicators are mixed. Increases in perceived uncertainty are concentrated in geopolitical risk. The Geopolitical Risk (GPR) Index (widely used in the scientific literature)¹¹ has increased considerably since tensions began to rise in the Middle East: since 7 October 2023, when the first attack by Hamas on Israel took place, this index has increased to twice its average value in 2023 (see Chart 1), although it remains well below the levels recorded in 2022 as a result of the Russia-Ukraine war. However, this increase does not appear to have translated into an

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- 1 The literature on the impact of uncertainty shocks on economic activity is very extensive. See, for example, Corinna Ghirelli, Maria Gil, Javier J. Pérez and Alberto Urtaun. (2021). "Measuring economic and economic policy uncertainty and their macroeconomic effects: the case of Spain", *Empirical Economics*, 60, pp. 869-892.
 - 2 Nicholas Bloom. (2009). "The impact of uncertainty shocks", *Econometrica*, 77(3), pp. 623-685.
 - 3 The VIX index is a measure of the constant 30-day expected volatility in the US stock market, derived from the real-time prices of S&P 500 index put and call options. This is one of the most globally recognised volatility measures, widely reported by financial media and closely monitored on a daily basis by a variety of financial market participants.
 - 4 Rüdiger Bachmann, Steffen Elstner and Eric R. Sims. (2013). "Uncertainty and economic activity: evidence from business survey data", *American Economics Journal: Macroeconomics*, 5(2), pp. 217-249.
 - 5 Kyle Jurado, Sydney C. Ludvigson and Serena Ng. (2015). "Measuring uncertainty", *American Economic Review*, 105(3), pp. 1177-1216.
 - 6 Chiara Scotti. (2016). "Surprise and uncertainty indexes: Real-time aggregation of real-activity macro-surprises", *Journal of Monetary Economics*, 82, pp. 1-19.
 - 7 Dario Caldara and Matteo Iacoviello. (2022). "Measuring Geopolitical Risk", *American Economic Review*, 112(4), pp. 1194-1225.
 - 8 The EPU index is a textual indicator of uncertainty regarding economic policies based on the press, first constructed for the United States by Scott Baker, Nicholas Bloom and Steven Davis. (2016) "Measuring economic policy uncertainty", *Quarterly Journal of Economics*, 131(4), pp. 1593-1636. The indicator is calculated on the basis of the number of articles containing at least one keyword relating to each of the categories "uncertainty", "economy" and "policy". Subsequently, these authors have applied the same methodology to construct EPU indicators for other countries. Data available [online](#).
 - 9 The EPU indicator for Spain is constructed by the Banco de España on the basis of the Spanish press. It considers the main national newspapers from January 1997 to the present (El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días and El Economista). See Corinna Ghirelli, Javier J. Pérez and Alberto Urtaun. (2019). "A new economic policy uncertainty index for Spain", *Economic Letters*, 182, pp. 64-67.
 - 10 Alejandro Fernández Cerezo and Mario Izquierdo. (2024). "The Banco de España Business Activity Survey: 2024 Q1", *Economic Bulletin - Banco de España*, 2024/Q1, 08.
 - 11 The GPR index is a textual indicator developed and published by US Federal Reserve economists. Dario Caldara, and Matteo Iacoviello. (2022). "Measuring Geopolitical Risk", *American Economic Review*, 112(4), pp. 1194-1225. Data available [online](#).

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Chart 1
Geopolitical risk index (a)

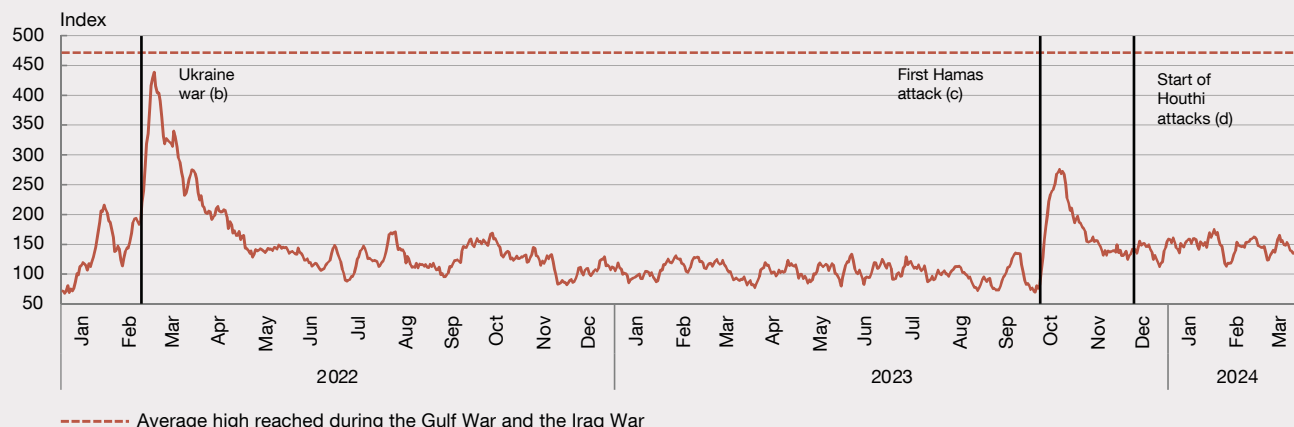


Chart 2
Global uncertainty. VIX (e)

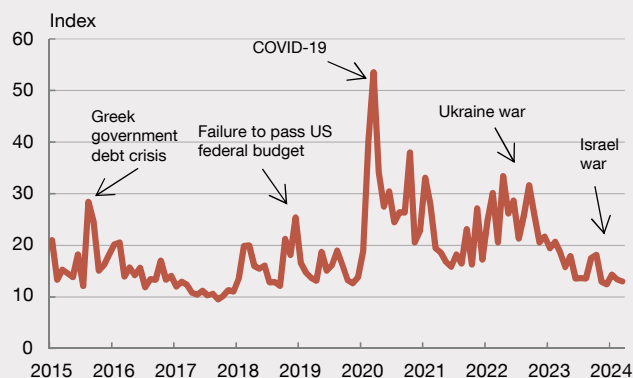
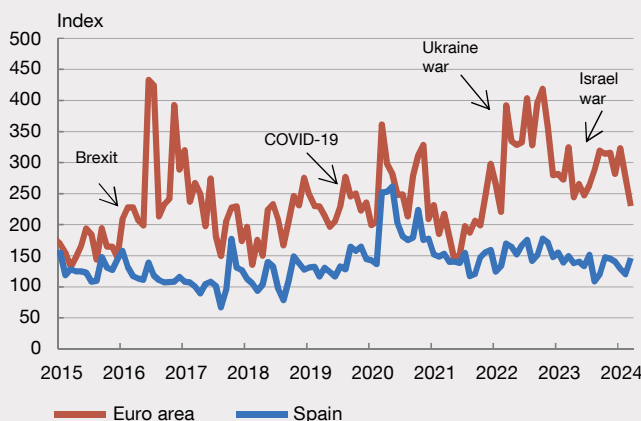


Chart 3
Economic policy uncertainty (EPU) (f)



SOURCES: Chicago Board Options Exchange (CBOE), Factiva DJ and Banco de España calculations.

- a The geopolitical risk (GPR) index is a textual indicator of geopolitical risk constructed by US Federal Reserve economists, available [online](#). Seven-day moving average, 1985-2019 = 100.
- b On 24 February 2022 the war in Ukraine broke out with the Russian invasion.
- c On 7 October 2023 an attack by Palestine militant group Hamas took place against the south of Israel, considered to be the worst attack suffered by the country since its creation.
- d On 10 December 2022 the Houthis launched various drones and missiles against vessels in the Red Sea.
- e The VIX index is a measure of the constant 30-day expected volatility in the US stock market, derived from the real-time prices of S&P 500 index put and call options. High values indicate market stress, and values above 30 indicate elevated uncertainty.
- f The EPU index is a textual indicator of economic policy uncertainty and is expressed as the deviation from its historic average level of 100. The EPU index for Spain is constructed by the Banco de España, while the EPU index for the euro area is constructed by Scott Baker, Nicholas Bloom and Steven Davis. (2016). "Measuring economic policy uncertainty", *The Quarterly Journal of Economics*. Data available [online](#).

increase in global economic uncertainty, if we consider, for example, the VIX, one of the indicators most commonly used to measure global financial uncertainty (see Chart 2).

At the domestic level, the indicator of uncertainty about the future course of economic policies does not appear to have been affected by these or domestic events (see Chart 3).

However, in 2024 Q1, for the second quarter in a row, the Banco de España Business Activity Survey identified uncertainty as the main factor constraining activity, adversely affecting around 60% of companies. In the euro area as a whole, there appears to have been an increase in the economic policy uncertainty indicator since the start of the war between Israel and Hamas.

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Chart 4
Impact of uncertainty shock on GDP: Spain (a)

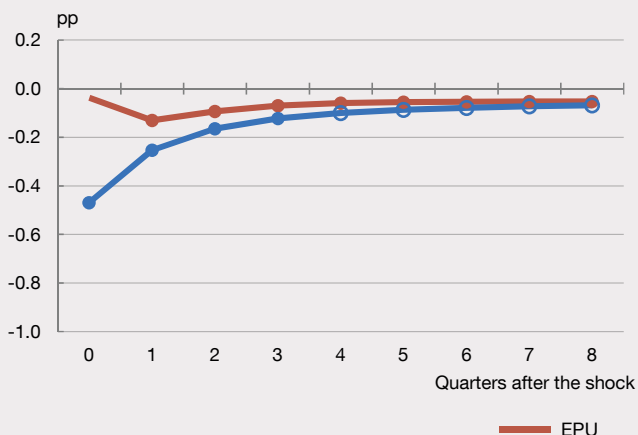
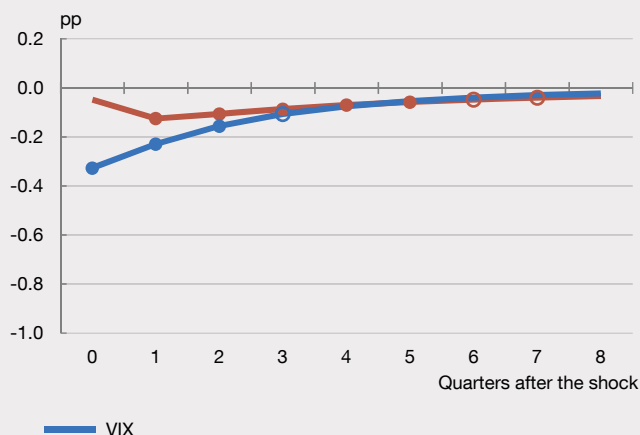


Chart 5
Impact of uncertainty shock on GDP: euro area (a)



SOURCES: Chicago Board Options Exchange (CBOE), Factiva DJ and Banco de España calculations.

a Both charts show responses to a positive shock of one standard deviation in the EPU index (red line) and in the VIX (blue line). The solid (empty) circles indicate statistical significance at the 5 (10)% level; solid line, not statistically significant. The VAR model for Spain includes the following variables: the EPU index, the spread over German 10-year sovereign bonds, quarter-on-quarter GDP growth and inflation; the VIX is included as an exogenous variable in first position, subject to the condition that its equation does not depend on the other lagged variables, but only on its own past values. In the case of the euro area, the same model is estimated, except that the spread between German and US bonds is considered as a proxy for the European spread.

These indicators are contemporaneous, since they capture agents' perceptions at a given point in time. Given its very nature, uncertainty cannot be perfectly quantified at all times, and may vary over time as agents receive a flow of imperfect and complex information to interpret.

These considerations highlight the importance of analysing the sensitivity of economic activity to possible larger increases in agents' perceived uncertainty. In this box, we use an estimation method based on vector autoregressive (VAR) models incorporating the uncertainty indicators mentioned above to do so.¹²

Chart 4 contains the responses of Spain's GDP to unexpected increases in both global and domestic

uncertainty.¹³ Uncertainty shocks are seen to cause material reductions in GDP. These impacts differ depending on whether the shock is of external or domestic origin.

An external financial shock has a larger negative impact on GDP (0.4 pp in the contemporaneous quarter), but also of shorter duration (as it remains statistically significant at the 5% level only during the first four quarters after the shock). By contrast, a domestic, economic policy-related uncertainty shock has a minor impact on GDP, the maximum impact being 0.1 pp after one quarter, but it is more persistent, remaining statistically significant at the 5% level even after two years (see Chart 4). In the literature, a financial shock of global origin tends to have a greater

12 The sovereign debt spread (in the model for Spain, this spread is defined as the spread between Spanish and German sovereign debt, while in the model for the euro area it is defined as the spread between German and US debt) and a price index are also included as additional control variables, to take into account the possible effects of the financial and nominal variables on the various indicators of uncertainty. The analysis also takes into account the effect of uncertainty stemming from the external environment, in particular the European Union, which allows the effects of country-specific shocks to be isolated. Specifically, the VAR model for Spain includes the following variables: the EPU index, the spread over German 10-year sovereign bonds, quarter-on-quarter GDP growth and inflation; the VIX is included as an exogenous variable in first position, subject to the condition that its equation does not depend on the other lagged variables, but only on its own past values. In the case of the euro area, the same model is estimated, except that the spread between German and US bonds is considered as a proxy for the European spread.

13 The size of the shock corresponds to one standard deviation of the structural shock estimated in the model. For the Spanish EPU index, this corresponds roughly to the rise associated with the general elections in November 2011 or to half of the rise related to the 2008 financial crisis. For the VIX, the structural shock considered corresponds to the increase related to the stock market collapse in China in August 2015.

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impact on the economy. However, the persistence of local shocks shows that they are relevant for identifying medium-term growth risks for Spain.

In the euro area, in comparison, the response of GDP to a local EPU shock is similar to that in Spain, with a maximum impact of 0.13 pp that falls over time. However, the impact continues for up to eight quarters after the shock. As in the case of Spain, the impact of a global uncertainty shock on GDP is greater, reaching 0.3 pp, and the effect remains negative and significant for four

quarters (see Chart 5). In comparison with Spain, the global shock has a somewhat smaller and less persistent impact on the euro area as a whole, where it causes less destabilisation. These results suggest that, in the current context of economic uncertainty, it will be very important to continue to monitor developments in these indicators, since increases could pose risks to growth. It should also be borne in mind that spikes in uncertainty can affect financial stability through multiple channels in addition to growth, such as risk premia, which are addressed in the main text of this report.