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The Language of Uncertainty: Reading Türkiye's Economic Pulse Through Geopolitical Fog

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ABSTRACT

Geopolitical uncertainty is an increasing concern for investors, entrepreneurs, and researchers. Traditional methods of measuring uncertainty often fall short, whereas Artificial Intelligence (AI)-driven Natural Language Processing (NLP) offers more accurate and competitive options. In this study, we develop a Geopolitical Country-Specific Uncertainty (GCSU) index for Türkiye by applying the economic policy uncertainty index methodology. Since geopolitical uncertainty involves Knightian uncertainty—which cannot be quantified with probabilities in advance—our approach measures it by analysing the frequency of economy-, policy-, and uncertainty-related terms in Turkish-language newspapers. Unlike existing indexes for Türkiye, such as the Geopolitical Risk (GPR) and the Economic Policy Uncertainty (EPU), which rely on English-language sources, our localised method provides a more precise measure of country-specific uncertainty. Our findings show that an unexpected increase in geopolitical uncertainty leads to declines in employment, industrial production, trade, consumer confidence, and stock prices, while oil prices and inflation rise in response. However, these results may not be observed when uncertainty is measured using English sources (e.g., through the index from the GPR-Türkiye). These insights highlight the importance for policymakers to consider geopolitical uncertainty in their economic planning and suggest directions for further research into measuring uncertainty with local language sources.

JEL Classification: E26, E22, E30

1 | Introduction: Why Measure Geopolitical Uncertainty[1]

Uncertainty remains a crucial concept in economics, affecting decisions across diverse economic conditions. Among various types of uncertainty, geopolitical uncertainty is gaining increased attention because of its capacity to generate prolonged economic volatility, distort investment choices, and reshape global trade patterns. Unlike other forms of uncertainty, geopolitical uncertainty has a Knightian nature, characterised by its unmeasurability and unpredictability, making it particularly challenging for economic agents and policymakers to forecast its impacts. Recently, the world economy has experienced a series of major geopolitical shocks, caused by events such as the Russia-Ukraine conflict, shifting global trade alliances, energy price shocks, rising cyber threats and climate risks, and regional instability in the Middle East and Asia-Pacific. These developments have led to increased uncertainty, resulting in

Parts of the manuscript were reviewed using a language support tool (by OpenAI) to improve clarity and readability. All academic content, data analysis, and interpretations are our original work.

global trade volatility, supply chain disruptions, higher inflation pressures, and volatility in international financial markets and capital flows. This highlights the critical need for a systematic and robust framework to measure geopolitical uncertainty.

Despite the increasing recognition of geopolitical uncertainty as a key factor in economic volatility, current measures of uncertainty have critical methodological limitations. Most commonly used indexes, including the Economic Policy Uncertainty Index (EPU) and the Geopolitical Risk Index (GPR), mainly depend on English-language media sources to gauge uncertainty across different countries. Although these indexes succesfully identify broad global and geopolitical trends, they often do not capture the specific uncertainty dynamics within individual countries, especially in non-English-speaking nations where local geopolitical narratives may differ from international reports. Using international media instead of local sources can lead to distortions or missing details, as geopolitical events might be perceived and reported differently within domestic contexts. This linguistic and contextual bias raises an important question: to what extent do existing global uncertainty indexes accurately reflect domestic geopolitical risks, especially in emerging economies?

To address this methodological shortcoming, this study introduces a Geopolitical Country-Specific Uncertainty (GCSU) Index for Türkiye, developed using Turkish-language news sources and an enhanced computational linguistics framework. By employing an AI-driven natural language processing (NLP) technique, this index significantly improves the accuracy of uncertainty measurement by incorporating a broader and more context-sensitive set of economic, policy, and uncertainty-related keywords. Unlike traditional indexes (such as GPR-Türkiye), which track uncertainty based on a limited set of internationally recognised English-language newspapers, the GCSU index employs a broad dataset of Turkish newspapers, ensuring a more precise, localised, and context-sensitive measure of geopolitical uncertainty. Furthermore, we expanded some relevant features of the GPR-Türkiye, namely: (i) we use eight national language newspapers; (ii) we increase the total number of keywords from 8 to 315; and (iii) we estimate the real macroeconomic effects of geopolitical uncertainty shocks. This methodological advancement represents a major contribution to the field, as it enables researchers to construct more accurate, country-specific uncertainty indexes that are free from the distortions introduced by external media narratives. In other words, by refining an extensive set of economic, policy, and uncertainty-related keywords, we improve the precision and relevance of uncertainty measurement for Türkiye, reducing potential biases associated with external sources.

This study contributes to the existing literature in several key ways. First, by leveraging advanced text-based uncertainty measurement techniques, it provides a novel methodological framework that improves upon existing geopolitical uncertainty indexes. The inclusion of localised, culturally relevant sources ensures that the GCSU index better captures the economic and political realities of Türkiye, as opposed to relying on internationally curated news sources. Second, estimating a stationary vector autoregression (VAR) model with local projections (Jordà 2005), this study empirically examines the macroeconomic effects of geopolitical uncertainty shocks in Türkiye. The results suggest that an unexpected increase in geopolitical uncertainty leads to significant and persistent declines in industrial production, employment, and consumer confidence while simultaneously triggering inflationary pressures and oil price hikes. Notably, the GCSU index, constructed using Turkish-language sources, captures these economic fluctuations more effectively (stronger and more persistent) than indexes relying on English-language sources, such as the GPR-Türkiye index. These findings emphasise the importance of using local-language data sources to measure uncertainty in non-English-speaking economies, further confirming the relevance of localised uncertainty indexes. Third, the results of this study have significant implications for policymakers and financial regulators. Given that traditional uncertainty indexes may underestimate country-specific risks, monetary and fiscal authorities should incorporate localised uncertainty measures into their policy frameworks to better anticipate economic downturns and craft more effective countercyclical policies.

This study aligns with the growing body of research that examines the role of uncertainty in business cycles (Alexopoulos and Cohen 2009, 2015; Jurado et al. 2015; Baker et al. 2016; Öztürk and Sheng 2018; Caldara and Iacoviello 2022a, among others), the countercyclical nature of uncertainty shocks (Bloom 2014), the link between inflation and inflation uncertainty (Friedman 1977; Ball 1992), and computing impulse responses from both the orthogonal shocks and the local projections by Jordà (2005). Then, we analyse the similarities and differences across such estimated impulse response functions. The findings provide empirical support for these theoretical frameworks by demonstrating that localised geopolitical uncertainty indexes exhibit stronger countercyclical behaviour than traditional English-language-based indexes.

By integrating text-based uncertainty measurement, macroeconomic modelling, and AI-driven linguistic analysis, this study advances both the theoretical and empirical literature on geopolitical risk, uncertainty, and economic forecasting. The insights from this research carry significant implications for policymakers, investors, and businesses, as understanding the dynamics of geopolitical uncertainty is crucial for developing effective economic policies and risk management strategies. The rest of this paper is organised as follows. Section 2 reviews the existing literature on geopolitical uncertainty and its macroeconomic effects. Section 3 outlines the methodology used to construct the GCSU index, highlighting the advantages of text-based uncertainty measurement using NLP and AI techniques. Section 4 presents how the GPR and the GCSU indexes correlate with each other. Section 5 discusses the empirical findings, including the effects of uncertainty shocks on key macroeconomic variables in Türkiye. Section 6 provides concluding remarks and suggestions for future research. Appendix A and References are present at the end of the article.

2 | Measuring Geopolitical Uncertainty: Related Literature on the Concept

The seed of the new measure comes from the concept of macroeconomic uncertainty, as distinct from risk, which can be traced back to Knight (1921). In this pioneering publication, Knight

stated that uncertainty, unlike risk, is not directly measurable ex post. The ex post is based on considering actual or realised results rather than forecasts. It is related to past performance. The concept of Knightian uncertainty is a macroeconomic aggregate. It cannot be regarded as being directly measurable ex post, as its 'realisations' are not known. However, ex ante proxies can be proposed for it to reflect the general change in sentiment in the climate in which economic decisions are taken. The ex ante, as opposed to ex post, means forecasts, or expected changes in activity than the actual results in an economy. It is associated with the future.

The first to explain the dynamics of the post-crisis economy after 2008 was Bloom (2009). Macroeconomic uncertainty has been defined by Jurado et al. (2013, 2015) as 'the conditional volatility of a disturbance that is unforecastable from the perspective of economic agents'. In the terminology proposed in this paper, the difference between Knightian and non-Knightian uncertainty is that the latter might be observable ex-post through inflation or economic growth or unemployment expectations, as statistical data for these indicators are available. According to Knight (1921), non-Knightian uncertainty should be called risk. It means a known probability distribution.

Knightian uncertainty is, by definition, not measurable. However, the substantial change in macroeconomic volatility after 2008 in a Knightian way has called for a measure to be developed that can reflect aggregate changes in macroeconomic sentiment that result mainly from changing geopolitical factors rather than from economic ones. The seminal paper in this respect is that of Baker et al. (2016), introducing the Economic Policy Uncertainty (EPU) Index. Due to its easy availability and transparency, it has already led to a substantial number of follow-on papers, as its first discussion paper version was published in Baker et al. (2013). The idea of stating Knightian uncertainty by counting the frequency of uncertainty-related keywords in newspapers was introduced by constructing the EPU index. They construct EPU indexes for several countries using digital searches of the local language newspapers. The EPU index for the USA has three components. The first one represents the frequency of newspaper articles referring to economic policy uncertainty. The other two components are based on the tax provision data and the 'uncertainty by disagreement' concept of uncertainty, which refers to discrepancies between professionally produced forecasts.

For other countries, the EPU index is usually based on newspaper articles only. The news-based EPU index considers the number of articles that include following descriptors like 'economy', 'policy', and 'uncertainty' in ten major US newspapers like *USA Today, Miami Herald, Chicago Tribune, Washington Post, Los Angeles Times, Boston Globe, San Francisco Chronicle, Dallas Morning News, New York Times*, and *Wall Street Journal*. It counts terms such as 'uncertainty' or 'variants of uncertainty'; 'economy' or 'variants of economy'; and one of the following fifteen policy terms: 'policy', 'budget', 'tax', 'federal reserve', 'regulation', 'legislation', 'spending', 'deficit', 'white house', 'war', 'house of representatives', 'president', 'senate', 'government' and 'congress' in ten major US newspapers. Digital archives of these newspapers have been searched, helping with Proquest newspaper archives and Access World News Newsbank services from 1985; this index is updated every day and is available at (www.policyuncertainty.com).

Since the first EPU index was based on English-language media sources, further interest in the EPU followers has led to the construction of similar indexes for different countries. There are two ways to measure and evaluate uncertainty for non-English speaking countries. The first is to translate the descriptors defined by the English language into a local or national language and search for articles published in that language. This has been used in the EPU and among others. The second is to tally the descriptors in English-language newspapers for articles concerning a country. It could be possible from some evidence that using English-language newspapers for non-English language-speaking countries might cause bias and fail to identify some issues (see e.g., Öztürk and Sheng 2018; Huang and Luk 2020; Kilic 2021; Kilic and Balli 2024).

The EPU index reflects the uncertainty that affects economic policy actions and how its effects are manifested. It provides a proxy for economic policy-related uncertainty and is already often used in econometric modelling to represent policy uncertainty shocks. The fundamental result obtained using some quantitative measures of Knightian uncertainty is given in Bloom (2014), who documented the countercyclical nature of this uncertainty, which rises in a slowdown or recession, and diminishes during a boom.

Following the methodology of the EPU index in Baker et al. (2016) explained above in more detail, there are still several uncertainty indexes created by Turkish language sources for Türkiye. For instance, Altug et al. (2021) tallied some keywords in each tweet of the selected user accounts on Twitter to construct a Twitter-based economic policy uncertainty (TEPU) index. Ermisoglu and Kanik (2013), Sahinoz and Erdogan Cosar (2018), and Topçu and Oran (2021) also built economic policy uncertainty (EPU) indexes using digital versions of newspapers to measure uncertainty. Cevik and Erduman (2020) measure monetary policy uncertainty by considering both Knightian and non-Knightian uncertainty methodologies. They constructed a news-based uncertainty index (Knightian) and then used the data of forecast errors from interest rate expectations to do survey-based uncertainty measures (non-Knightian).

In the literature, the broad effects of economic policy uncertainty (EPU) have been explored across various markets, including retail energy markets, the real sector, and African economies. For instance, Ogbuabor et al. (2023), Ekeocha et al. (2023), and Ogbuabor et al. (2022) examine the asymmetric effects of EPU, emphasising the importance of governance institutions and sector-specific volatility. Their results highlight how economic policy uncertainty can cause significant disruptions in markets and the crucial role of governance frameworks in reducing these impacts.

Additionally, research has focused on the specific challenges faced by emerging markets, such as Türkiye, in managing both economic policy uncertainty and geopolitical risks. Studies by Mansour-Ichrakieh and Zeaiter (2019), Demir and Danisman (2021), and Hoque and Zaidi (2020) show how these combined risks can influence financial markets, credit

availability, and stock returns, especially in developing economies, making them more prone to instability.

The idea of expressing Knightian uncertainty by counting the frequency of uncertainty-related phrases in newspapers and on the internet quickly found followers. The most relevant development seems to be the monthly geopolitical risk (GPR) index created by Caldara and Iacoviello (2016, 2018, 2022a). The Caldara and Iacoviello (2016) index has also been constructed using English sources for some developing countries, including Türkiye. Specifically, the GPR-Türkiye has international sources of specific event coverage from The New York Times, Chicago Tribune, and The Washington Post. It measures geopolitical uncertainty using text search methods of counting the frequency of words related to the eight principal geopolitical terms and the name of the country or main city alone.

Studies by Dogan et al. (2021) and Adedoyin et al. (2022) focus on resource-dependent economies and the impact of uncertainty on export-led growth strategies. They demonstrate how increased economic uncertainty can negatively impact the profitability of natural resource sectors and hinder growth in export-dependent economies.

Ogbuabor et al. (2021) explored the effect of EPU on the Nigerian stock market, showing how policy uncertainty can increase volatility in stock returns, reflecting investor concerns. Their work contributes to understanding the broader implications of EPU in developing economies and offers insights for policymakers and investors.

Jirasavetakul and Spilimbergo (2018) constructed an uncertainty index using English sources from Dow Jones' Factiva news database to measure policy-related economic uncertainty in Türkiye. To estimate to what extent uncertainty impacts the dynamics of the Turkish economy, they estimated the effect of uncertainty with the difference in difference (DID) technique, analysing investment, employment, net borrowing, and investment irreversibility in Türkiye. However, an unexpected increase in uncertainty measured by English sources (non-country-specific) may cause an increase in employment. Clearly, this result is contrary to the economic theory that the Bloom hypothesis claims in the countercyclicality.

There is a new uncertainty index by Ahir et al. (2018) that has been constructed using the English sources of the quarterly Economist Intelligence Unit (EIU) country reports for 34 large advanced and emerging market economies from 1955 onwards. The EIU report analyses the key economic, financial, and political trends in each country it covers, and the resulting World Uncertainty Index (WUI) includes 143 countries, among them Türkiye.

Since measures derived from the standard macroeconomic data do not reflect uncertainty well enough because they are backward-looking, a forward-looking uncertainty measure needs to be constructed to capture more recent unexpected changes in uncertainty. Following this observation, Altig et al. (2020) analysed several forward-looking indicators of economic uncertainty for the US and UK before and during the COVID-19 pandemic. These indicators are stock market volatility, newspaper-based uncertainty measures, Twitter-based economic uncertainty, subjective measures of uncertainty computed from the survey of business uncertainty (SBU) about future business growth, and disagreement among professional forecasters about future GDP growth.

To estimate economic policy uncertainty in the euro area, an unsupervised machine learning algorithm running on news articles and describing overall economic uncertainty from German, French, Spanish, and Italian newspapers was developed by Azqueta-Gavaldón et al. (2020).

A new index of global economic policy uncertainty (GEPU) was constructed by applying principal component analysis (PCA) to the economic policy uncertainty indexes for twenty primary economies (Dai et al. 2021). The GEPU-PCA index is a good proxy for economic policy uncertainty on a global scale, and it is positively correlated with stock market volatility and the global financial market.

A text-based country-specific Knightian uncertainty index was constructed by Charemza et al. (2022a). To construct such measures for different countries further on, an idiosyncratic method was described in detail. Specifically, the four Russian newspapers were used for the horizon between 1992 and 2018 to capture economic policy uncertainty in Russia. The authors tallied more than a million newspaper articles related to the keywords in the descriptors. To test the real effects of uncertainty measured by the country-specific index, they estimated local projection impulse responses from the uncertainty index to industrial production in Russia.

Another index that is computed for several countries, albeit one that uses a different methodology, is that by Öztürk and Sheng (2016, 2018). Instead of a news search, they used the concept of 'uncertainty by disagreement' (see e.g., Bomberger 1999; Lahiri and Sheng 2010), which is the idea that dispersion in the forecasts of a panel of forecasters represents a measure of uncertainty.

The main problem related to further expanding the idea of using the media has not yet been researched fully, and this is the issue that the uncertainty measures are based on English-language sources. Clearly, the geopolitical risk that is the main cause of Knightian uncertainty can be more accurately expressed if this is done using regional news, which is usually presented in local languages. That expressing geopolitical risk using English language sources alone might be misleading has been documented by Öztürk and Sheng (2016), who found a negative correlation between the uncertainty measures for China based on English and Chinese-language sources. In this paper, this finding has also been confirmed by the Turkish language press country-specific measures and the English language-based geopolitical risk for Türkiye (GPR-Türkiye) taken from Caldara and Iacoviello (2022a).

With the economic effect of the dissemination of the Coronavirus, the growing geopolitical uncertainty, and the high oil price volatility, the literature has been widening to analyse the policy-related economic uncertainty and its relationship

with oil price volatility. In this concept, Liu et al. (2021) drew that one standard deviation geopolitical uncertainty shock is likely to cause increases in oil price volatility. There are also similar findings that come from Bloom (2009), Antonakakis et al. (2014, 2017), Noguera-Santaella (2016), You et al. (2017), Bouoiyour et al. (2019), and Kang et al. (2019).

In order to explore the potential real effects of geopolitical uncertainty from a different perspective, the local projection impulse responses by Jordà (2005) are estimated in this paper, and are compared with orthogonal impulse responses. Given this, we will analyse geopolitical uncertainty shocks by constructing various confidence intervals to see the robustness of the measure for Türkiye.

One of the main objectives of this paper is to construct a country-specific index of geopolitical uncertainty for Türkiye to confirm empirically the main theoretical hypotheses that link uncertainty to economics, these being (i) the Bloom (2014) hypothesis about the countercyclical nature of Knightian uncertainty; and (ii) the Friedman–Ball hypothesis (Ball 1992; Friedman 1977) that positive causality goes from uncertainty to inflation. For a non-English speaking country, a properly constructed measure of this type should be based on media sources in the local language and in national circulation, such as electronically available newspapers, rather than on the English-language media. We verify these hypotheses for the case of Türkiye.

We found that an unexpected increase in uncertainty can cause a permanent decline in industrial production, employment, trade, consumer confidence, and stock prices in Türkiye. These results are evident and statistically significant only if the uncertainty is measured using articles published in the Turkish-language press. It has also been found that an increase in uncertainty, measured using Turkish press sources, leads to increases in inflation and oil prices.

3 | Construction of Geopolitical Country-Specific Uncertainty (GCSU) Index for Türkiye

The main methodological challenge in constructing a Knightian index of geopolitical uncertainty is that it cannot be verified ex-post. The ex-ante measures can be based either on an evaluation of disagreements regarding future expectations or on the frequency of explicit assessments of uncertainty by experts or the media. In this study, we apply the latter approach, following Baker et al. (2016). More specifically, we develop a text-mining-based Knightian uncertainty index using machine learning techniques to analyse geopolitical uncertainty in the Turkish economy.

The objective of this study is to construct a monthly uncertainty-related index for Türkiye, called the Geopolitical Country-Specific Uncertainty (GCSU) Index, by adapting the methodology created by Baker et al. (2016). The GCSU index is specifically designed to measure uncertainty related to geopolitical and macroeconomic developments relevant to the Turkish economy. Since uncertainty considerably influences economic and financial markets, a country-specific approach is essential for accurately evaluating its effects. Additionally, the GCSU index seeks to track the evolution of uncertainty in response to both domestic and international events, making it a useful tool for economic and policy analysis.

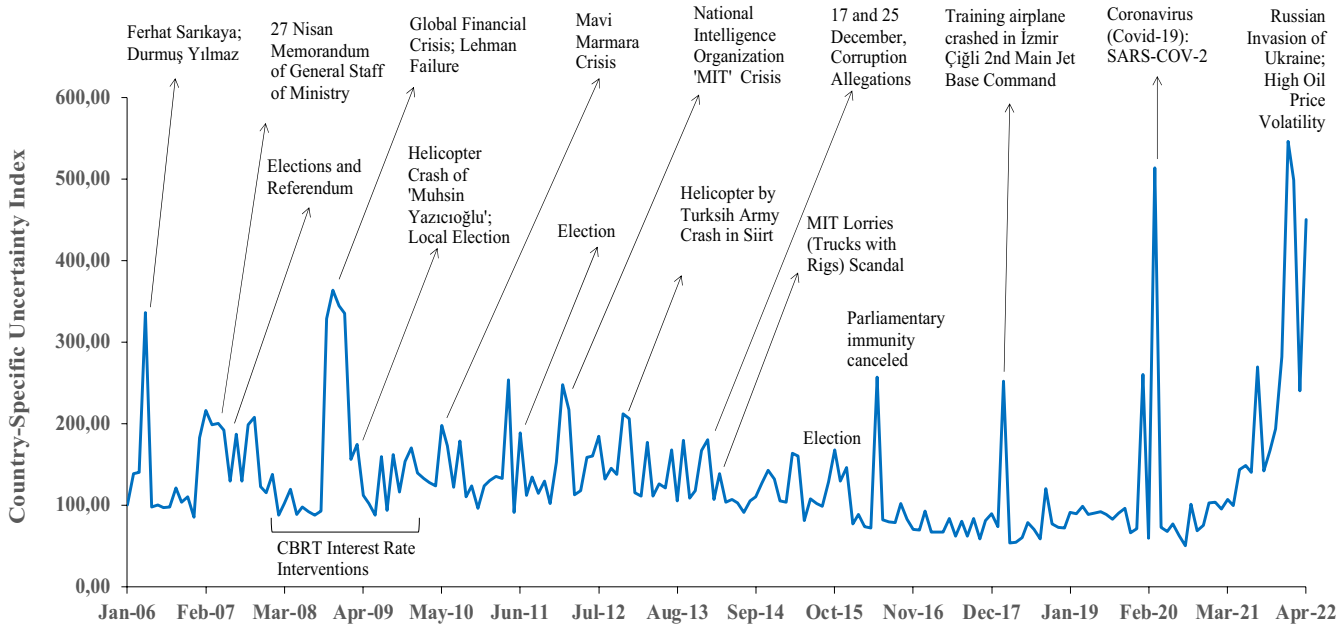
The GCSU Index is constructed to gauge geopolitical uncertainty in Türkiye by systematically analysing the digital news archives from six leading Turkish newspapers from January 2006 to April 2022: *Cumhuriyet*, *Dünya*, *Hürriyet*, *Milliyet*, *Sabah*, and *Zaman*. Due to Zaman's closure in July 2016, it was replaced by *Habertürk* from July 28, 2016, to December 31, 2016. Starting in January 2017, *Sözcü* was included as a replacement for *Zaman*. The index is based on a set of predefined keyword descriptors carefully selected to capture key aspects of geopolitical and economic uncertainty. These descriptors are categorised into three main groups: {*economy*}, {*policy*}, and {*uncertainty*}, aligning with the methodology of Baker et al. (2016) while being adapted to Türkiye's economic and geopolitical context. The complete list of descriptors is provided in the Appendix A.

The newspapers were selected to ensure representativeness and comprehensiveness, covering a wide spectrum of political and economic perspectives to provide a balanced representation of uncertainty perceptions. Their high circulation, influence on public discourse, and consistent digital archives made them suitable for a systematic and uninterrupted text-mining analysis. By incorporating newspapers with diverse editorial stances, the index aims to mitigate potential inclinations and provide a more objective measure of geopolitical uncertainty in Türkiye.

The methodology used in constructing the GCSU index involves several key steps. First, a database of approximately 1.5 million news articles was compiled, covering the specified period and newspaper sources. Using Structured Query Language (SQL), ensuring a systematic and automated approach to identifying relevant articles, we systematically searched for the predefined keywords[2] within each article. An article was included in the index calculation if it contained at least one keyword from each of the three descriptors. This approach ensures that the index reflects articles explicitly discussing uncertainty within an economic policy-related context, rather than capturing generic mentions of these terms. Second, the raw counts of matched articles were transformed into standardised and normalised values following the methodology proposed by Baker et al. (2016). This adjustment accounts for variations in newspaper volume over time, allowing for meaningful comparisons across different periods. Third, the standardised index values were plotted to identify peaks corresponding to prominent geopolitical and economic events.

Figure 1 presents the GCSU index from January 2006 to April 2022, showing both the standardised and normalised peaks of the counted terms. These peaks correspond to major geopolitical and economic events in Türkiye as captured by the selected newspapers. Notably, sharp increases in the index align with key moments of uncertainty, such as political crises, economic fluctuations, and international conflicts.

The peaks indicating an increase in uncertainty are identified as corresponding to the events in the economy:



Note: This graph consists of the terms of "***economy and its variants***"+"***policy and its variants***"+"***uncertainty and its variant***" in eight major newspapers such as Cumhuriyet, Dünya, Habertürk, Hürriyet, Milliyet, Sabah, Sözcü, and Zaman in Turkish media. The data span is from January 1, 2006 to April 31,2022 All data has been standardized and normalized with 100.

FIGURE 1 | Geopolitical Country-Specific Uncertainty (GCSU) Index for Türkiye, 2006–2022, monthly. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

1. The presidential election and military memorandum (27 April 2007), followed by parliamentary elections (22 July 2007) and a constitutional referendum (21 October 2007).
2. The December 2013 corruption scandal, in which allegations against the Erdoğan government were made public on 17 and 25 December 2013.
3. The MİT Trucks Incident, where trucks allegedly carrying weapons were stopped on 19 January 2014, with the news being published by Cumhuriyet on 29 May 2015.
4. The outbreak of the COVID-19 pandemic led to significant economic and policy uncertainty, began with the first confirmed case in Türkiye reported on 11 March 2020.
5. The Russian invasion of Ukraine on 24 February 2022 had profound geopolitical and economic implications.

The timing of these peaks, indicating uncertainty, was verified using official data sources, including the Ministry of Development of Türkiye, the Central Bank of the Republic of Türkiye (CBRT), the Turkish Statistical Institute (TURKSTAT), the BBC, and Bloomberg. These sources provide independent validation of the geopolitical and economic events contributing to uncertainty spikes in the GCSU index.

4 | Comparison of English and Local-Language Text-Based Uncertainty Indexes: The GPR and GCSU

It might be wiser to delve into the conceptual differences between the local-language and English-language uncertainty indexes, as they may measure slightly different aspects of geopolitical uncertainty. As the proverb goes: 'If you are in the forest, you don't see it; you are just seeing trees'. In other words, local language indexes might be more prone to biases arising from political, cultural, or social influences, as they focus on regional or country-specific events. In contrast, English-language indexes might miss important local nuances, much like 'seeing the forest but not the trees'. This can lead to gaps in capturing changes in uncertainty driven by local events that are of little concern to international audiences.

Geopolitics studies the political interactions between countries, considering how geography affects international relations. Key factors in geopolitics include threats, risks, and tensions, which can remarkably influence these relationships. The Geopolitical Risk (GPR) index is based on information from leading international English-language sources; however, the GCSU index we developed focuses solely on Turkish-language sources from local and prominent newspapers in Türkiye. Caldara and Iacoviello (2022b), who have been researching geopolitical risks since 1985, constructed the GPR uncertainty index by tracking specific terms related to geopolitics, such as geopolitical risk, tension, threat, war, and terrorism. Our approach differs in that we include terms that reflect not only geopolitical but also political and socio-economic developments, reflecting a broader spectrum of uncertainty. Our term set was further expanded to include keywords specific to Türkiye's political and cultural context, which adds to the cultural and linguistic relevance of our index. These distinctions between English-language and Turkish-language text-based uncertainty indexes are crucial, as they may lead to discrepancies in analysis. To visually compare the GCSU with the GPR, the uncertainty indexes are presented in the following figure.

Figure 2 shows that the GCSU index has a Pearson correlation coefficient of −0.0341 with the GPR-Türkiye. This

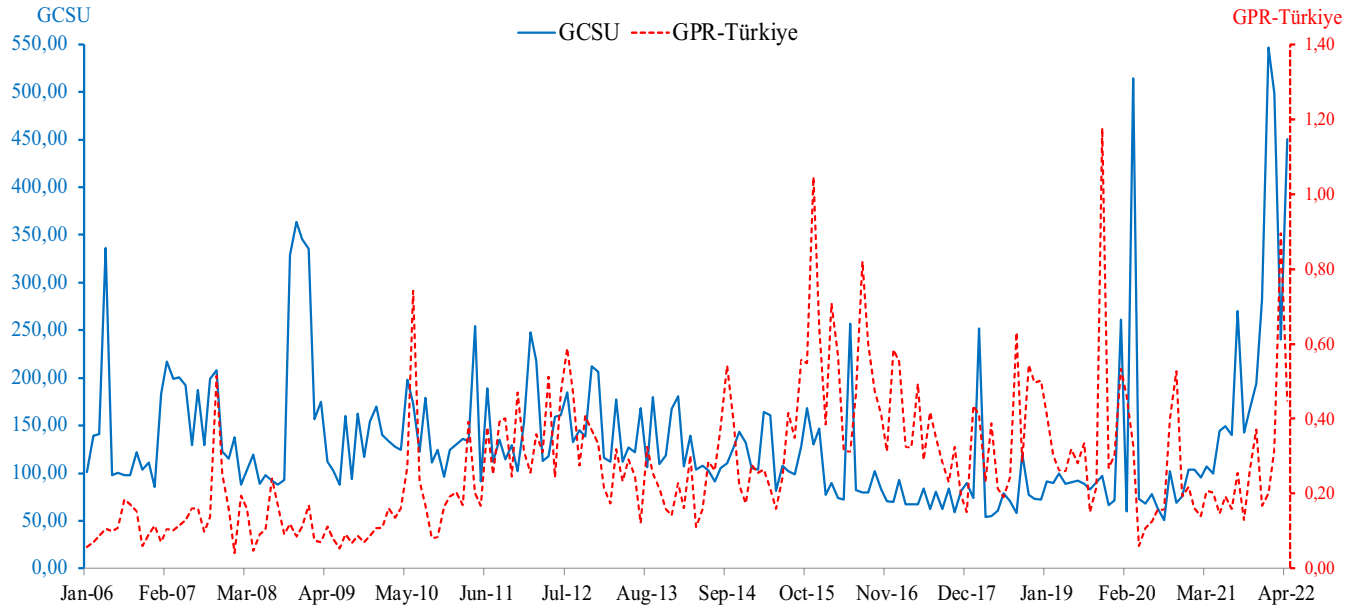


FIGURE 2 | Comparison of Turkish and English language-based uncertainty measures (GCSU vs. GPR-Türkiye), January 2006–April 2022, monthly. *Source:* GCSU: authors' own computation; GPR-Türkiye: obtained directly from Matteo Iacoviello: GPR from www2.bc.edu. [Colour figure can be viewed at wileyonlinelibrary.com]

weak correlation suggests that geopolitical uncertainty in Turkish-language sources does not strongly align with its English-language counterpart, highlighting the importance of considering local perspectives in uncertainty analysis. The reliance on Turkish-language sources presents both advantages and limitations, as discussed below.

According to the descriptive statistics in Table A3, the distributions of the uncertainty indexes deviate from normality, as evidenced by their skewness and kurtosis values. The GCSU index shows a skewness of 2.695 and kurtosis of 12.648, indicating a right-skewed distribution with heavy tails, while the GPR-Türkiye index displays a skewness of 1.656 and kurtosis of 7.400, also suggesting a non-normal distribution with a slightly positive skew. Additionally, the Jarque–Bera test confirms the non-normality of both distributions, with extremely low p-values (0.000), confirming that the null hypothesis of normality can be rejected, suggesting that the data significantly deviates from a normal distribution.

Given that the Pearson correlation assumes normally distributed variables, its application in this case may not yield reliable results. Therefore, to account for the non-normality of the data, we employed Spearman Rank Correlation, which does not require the assumption of normality and is more suitable for capturing monotonic relationships between variables. The Spearman Rank Correlation coefficients are presented below, reflecting the non-parametric relationship between the uncertainty indexes.

The results indicate a weak negative relationship of −0.1508 between the GPR-Türkiye and GCSU indexes, suggesting that as one index increases, the other tends to decrease, though the patterns of change are not strongly aligned. This weak inverse relationship highlights that while both indexes capture aspects of geopolitical uncertainty, their correlation is limited. Given the non-normal distribution of the data, this method provides more reliable evidence of the monotonic relationship between the two variables, in contrast to Pearson correlation, which assumes normality. However, further analysis could be needed to determine the statistical significance of this correlation.

In light of these findings, the reliance on Turkish-language sources presents both advantages and limitations. On the one hand, local newspapers offer detailed coverage of domestic events, ensuring that the index accurately reflects uncertainty within the Turkish context. Additionally, local media often capture nuances that may be overlooked in international reports. On the other hand, the exclusive use of Turkish sources introduces potential inclinations. The political stance of different newspapers may influence how uncertainty-related issues are framed, leading to variations in reported events. Moreover, certain international developments might receive limited or selective coverage, affecting the comprehensiveness of the index. The absence of English-language sources also poses challenges for direct cross-country comparisons of geopolitical uncertainty. Despite these limitations, selecting diverse newspapers helps mitigate potential biases by incorporating multiple perspectives. Future research could complement this methodology by integrating international media sources to enhance cross-country comparability.

Previous studies (e.g., Archetti 2010; Clausen 2004) have shown that national media outlets, especially those in non-English languages, often cover geopolitical events differently based on local political, economic, and cultural contexts. These differences can cause discrepancies in the interpretation and reporting of the same event in different linguistic contexts.

English sources may present international news about geopolitical developments in Türkiye, where such news is more

directly related to events in neighbouring countries, including Syria, Iran, Iraq, the Black Sea countries, or the Mediterranean and Aegean countries. More precisely, such sources predominantly contain news related mainly to the region, including Türkiye. For example, the terms 'terrorist attacks', 'threats', and 'war' in the GPR index refer more commonly to geopolitical news in the Middle East, which covers Türkiye, but also a lot more than just Türkiye. *War*, for instance, covers several countries in the Middle East, like Syria or Iraq, but not really Türkiye. This means that news items using these terms are not relevant for a country-specific base for Türkiye, as they are most probably related to geopolitical factors in nearby countries. Such news stories could refer to a broader area covering neighbouring countries in the Middle East as well as Türkiye. As a result, this broader regional focus may introduce measurement errors by including events outside Türkiye that could distort the country-specific focus of the GCSU index. These measurement errors can lead to an inaccurate representation of geopolitical uncertainty specific to Türkiye, undermining the precision of the uncertainty measure derived from English-language sources.

The weak correlation between the two series might arise from the fact that the geopolitical risk index could not be prepared for Türkiye properly. This is because the term sets of the GPR index cover only geopolitics, but the geopolitical country-specific uncertainty (GCSU) index captures the policy-related interior economic uncertainty developments in Türkiye. It means the country-specific index contains more everyday news about economic policy events in Türkiye. Such factors could combine to cause a weak correlation between these indexes for Türkiye.

Given the weak correlation between the Turkish and English-language uncertainty measures, future research could explore the potential for a hybrid model, integrating both Turkish and English-language media sources to produce a more comprehensive and cross-culturally valid uncertainty index.

Overall, the reasons explained above and the big discrepancies between the index we created and the GPR make us believe that both indexes might provide contradicting results in explaining the economic variables in Türkiye. In the next session, we will test these indexes under different economic hypotheses.

5 | Estimating the Real Effects of Geopolitical Uncertainty

We test our uncertainty measure by estimating a nine-variable VAR, as in Caldara and Iacoviello (2018), to evaluate the impact of geopolitical uncertainty shocks on real economic activity. We have then estimated VARs with various confidence intervals and different lag orderings, meaning that after estimating the effects of orthogonal uncertainty shocks on the real economic activity for Türkiye, the cumulative (for 25 periods) impulse responses of the uncertainty shocks on the macroeconomic dynamics will have been further applied by a seminal methodology: local linear projection.

5.1 | Evidence From the VARs: Estimating the Impulse-Responses by Local-Linear Projections

An alternative way to construct the impulse responses is local-linear projection, which consists of computing the effects of a shock at time t to $t+h$ by forecasting y_{t+h} with and without a shock (Jordà 2005, 2009). Local-linear projection impulse responses do not need to take any specification and estimation of the unknown true multivariate dynamic system (Kilian and Kim 2009).

Local-linear projection can be expressed as;

$$\boldsymbol{y}_{t+h} = \boldsymbol{x}^h + \boldsymbol{A}_1^{h+1}\boldsymbol{y}_{t-1} + \boldsymbol{A}_2^{h+1}\boldsymbol{y}_{t-2} + \ldots + \boldsymbol{B}_p^{h+1}\boldsymbol{y}_{t-p} + \boldsymbol{\epsilon}_{t+h}^h \qquad h = 0, 1, 2, \ldots, h \tag{1}$$

where $\boldsymbol{x}^h$ is an $n \times 1$ vector of constants, and the $\boldsymbol{A}_i^{h+1}$ are matrices of coefficients for each lag i and horizon $h+1$. We denote the collection of h regressions in (2) as *local-linear projections* (non-parametric considerations) (Jordà 2005). The local-linear projection of impulse responses (abbreviated LLPs further on) is in (1) are

$$\widehat{\mathrm{LLP}}(t, h, \mathbf{d}_i) = \hat{\boldsymbol{A}}_1^h \boldsymbol{d}_i \qquad h = 0, 1, 2, \ldots, h \tag{2}$$

where $\boldsymbol{d}_i$ indicates shocks and $\hat{\boldsymbol{A}}_1^h$ estimates the impulse-response coefficients.

In addition to the marginal error bands, Jordà (2009) developed two further sets of uncertainty bands to depict the so-called impulse responses and to split the individual significance of coefficients into a given horizon. One such band representing uncertainty can be traced back to Scheffé's (1953) S-method, and the other is on orthogonal linear projections.

5.1.1 | Applications for Testing the Bloom and Friedman–Ball Hypotheses

We estimate a stationary VAR, as in Caldara and Iacoviello (2018), using 6 months of lags from January 2006 through February 2022. We do not use the same VAR but instead include similar variables to cover the close sources of variation in the variables[3]. To analyse the impulse responses (IRs) from a 9-variable VAR (abbreviated VAR-9 further on), we consider a Cholesky decomposition to recover orthogonal shocks and the local projections with the following ordering:

$$(\text{VAR}-9)=\begin{bmatrix}\text{GCSU}\\ \text{GPR Türkiye}\\ \text{consumer confidence}\\ \text{industrial production}\\ \text{employment}\\ \text{gross trade}\\ \text{stock price}\\ \text{oil price}\\ \text{inflation}\end{bmatrix}.$$

We show the dynamic responses of the macro variables to a one standard deviation uncertainty shock in the VAR-9. To our baseline VAR specification, the information criteria-based lag specification on the original data suggests the lag length to be 1 for the optimal lag of the VAR-9 when using *BIC* and *HQ*, or 2 when using *AIC* and *FPE*, or 6 when using *LR*. Given that, the optimal lag of the VAR-9 we decided was suggested by the criteria *LR*, namely 6 months of lags of all endogenous variables, as shown in Figure A2 in Appendix A, in more detail.

The VAR-9 we estimated performs the LLP estimations for testing the hypotheses. This estimation consists of (i) constructing orthogonal impulse-responses (IRs) from the stationary VARs, (ii) computing *marginal*, *conditional*, and *Scheffé* bands[4] (confidence intervals), (iii) testing the robustness of the impulse-responses (IRs) with the *local projection* methods computed in (ii), and (iv) comparing the IRs with LLPs.

Figure 3 represents responses of industrial production and trade to an unexpected increase in uncertainty by estimating IRs and LLPs from the VAR-9 together with conditional, marginal, and Scheffé bands around LLPs, all identified with a standard Cholesky decomposition. Figure 4 depicts responses of inflation to an unexpected increase in uncertainty by estimating IRs and LLPs from the VAR-9 together with conditional, marginal, and Scheffé bands around LLPs, all identified with a standard Cholesky decomposition.

We computed confidence intervals like Scheffé, marginal, and conditional (Jordà 2009) bands. The Scheffé bands are in the forms of 95%, 90%, 75%, 50% and 25% confidence intervals, respectively. However, marginal and conditional bands form in 90% and 68% confidence intervals. Scheffé bands, which are presented as simultaneous bands, show a clearer simulation of uncertainty related to the impulse responses when narrower intervals have been applied. If the impulse responses estimated from the VAR orthogonalisation are outside such intervals, they can be interpreted as individual significance of the differences between the local projection and the orthogonalisation.

The first empirical findings obtained from Figures 3 and 4 show the impulse responses computed using the different uncertainty bands (confidence intervals), which are constructed by fitting a VAR of order six with local projections (Scheffé, marginal, and conditional bands). However, for most periods, 95% confidence intervals (marginal) from fitting the VAR of order six include zero, which means that the hypothesis that the true values of impulse responses are equal to zero cannot be rejected. Given that, the results of the 95% marginal CI have not been presented here. Each panel in Figures 3 and 4 displays the impulse response of a variable in the VAR to a shock in the variable *uncertainty*, estimated as follows: the solid black line is the impulse responses from local linear projection (LLPs) with two standard-error bands (Scheffé or marginal or conditional confidence intervals) displayed in different dashed black lines. The orthogonal responses (IRs) based on a VAR-9 are displayed by the solid black line with multiplication symbols. The horizontal line represents months after a geopolitical uncertainty shock, $h=1, 2, ..., 25$, together with impulse responses and confidence intervals.

The two panels in Figures 3–5 display the effects of this shock on the economic variables over time, represented through two different statistical methods:

Panel A illustrates impulse response functions using Jordà bands, which visually represent the responses of industrial production and trade to a geopolitical uncertainty shock. The Jordà bands capture broader confidence intervals, offering a more robust view of the uncertainty around the responses of these variables.

In Panel B, the impulse response functions are depicted with Scheffé bands. These bands help to refine the interpretation of the shock's impact on the economic indicators and assist in comparing different estimations of uncertainty. Scheffé bands offer narrow confidence intervals compared to other methods, enhancing the robustness of the results.

5.1.1.1 | Application for the Countercyclicality (Bloom Hypothesis). Existing empirical research on the real effect of uncertainty has often estimated the dynamic relationships between real activity and various proxies for uncertainty (Baker et al. 2016; Bloom 2009, 2014; Caldara and Iacoviello 2022b; Jurado et al. 2015; Öztürk and Sheng 2018). Such proxies are countercyclical according to the results of the VAR estimates. Specifically, employment, industrial production, and trade are most significantly affected by the unexpected changes in proxies for uncertainty.

The dynamic response of aggregate economic activity to geopolitical uncertainty has been analysed by estimating the VAR models we described above. The following figure shows the responses of industrial production and trade to the uncertainty shock in the VAR-9.

We observe that an unexpected increase in geopolitical uncertainty leads to a decline in industrial production, reaching a peak negative effect of approximately 1.04% in the second month, based on conditional and marginal bands. This finding is statistically significant, as boundaries of the confidence intervals differ from zero, allowing us to reject the null hypothesis that the true values of impulse responses are equal to zero. The production effect is primarily negative, based on the point estimates of the impulse responses from VAR-9 and the LLP, which align with the conditional 68% bands in response to an increase in geopolitical uncertainty. However, this effect turns positive in case of responding to an increase in geopolitical risk, as depicted in Figure 5.

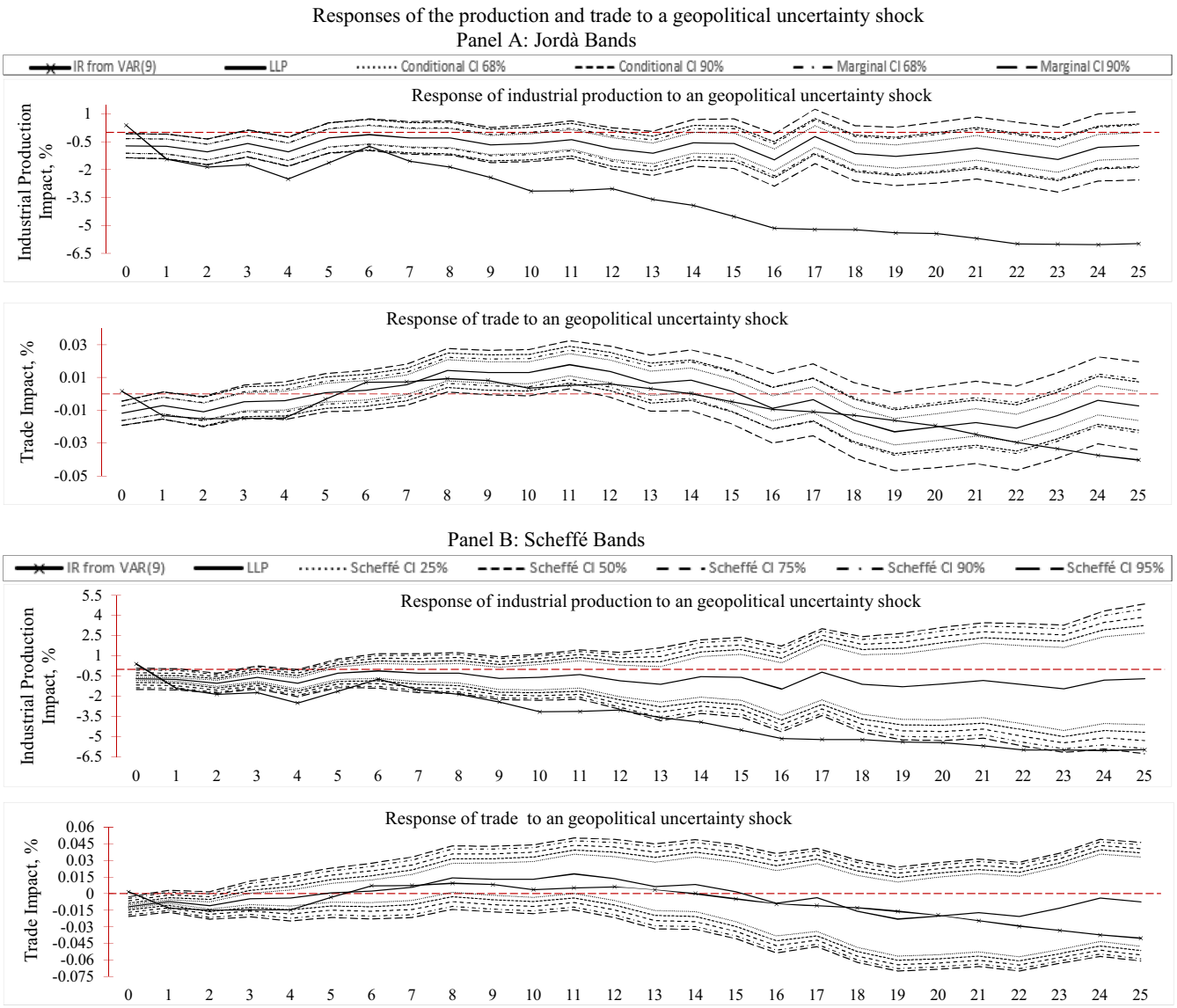


FIGURE 3 | Impulse responses of industrial production and trade from VAR-9 and local projections. Response of the production and trade to a geopolitical uncertainty shock. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

Trade declines in response to an increase in geopolitical uncertainty. It displays a fall of around −0.011% in the second month according to conditional and marginal bands. The effect of the uncertainty on the trade is also statistically significant, meaning that the null hypothesis that the true values of impulse responses are equal to zero can be rejected. Between the 5th and the 13th months, there are interesting results obtained from the point estimates of the GCSU. This means an unexpected increase in geopolitical uncertainty causes temporary increases in trade, according to the estimations by IRs from VAR-9 and LLPs. However, the trade increased by around 0.018% in response to an increase in geopolitical uncertainty in the 11th month, according to conditional and marginal bands. The trade persistently decreases by around −0.021% in response to an increase in geopolitical uncertainty in the 22nd month, according to conditional bands and the marginal 68% band. One of the significant estimations is that the point estimates by the IR from VAR-9 and by the LLP mostly move together within conditional and marginal confidence intervals.

Regarding Scheffé bands, point estimations of the GCSU are not statistically significant because the confidence intervals mainly include zero, except for the first few months, so the null hypothesis that the true values of impulse responses are equal to zero cannot be rejected.

The results from Figure 3 indicate that geopolitical uncertainty can dampen economic activity, particularly in industrial production and trade. These findings support the broader uncertainty literature (e.g., Bloom 2009), which suggests that high geopolitical uncertainty may cause a reduction in investment and slow down overall economic growth, especially in emerging economies like Türkiye.

5.1.1.2 | Application for the Friedman–Ball Hypothesis. In order to understand the recent economic outlook for Türkiye clearly, the inflation dynamics and their relationship with other economic and financial variables have been analysed in more detail here. We aimed to provide the most transparent information related to the dynamics of the Turkish economy

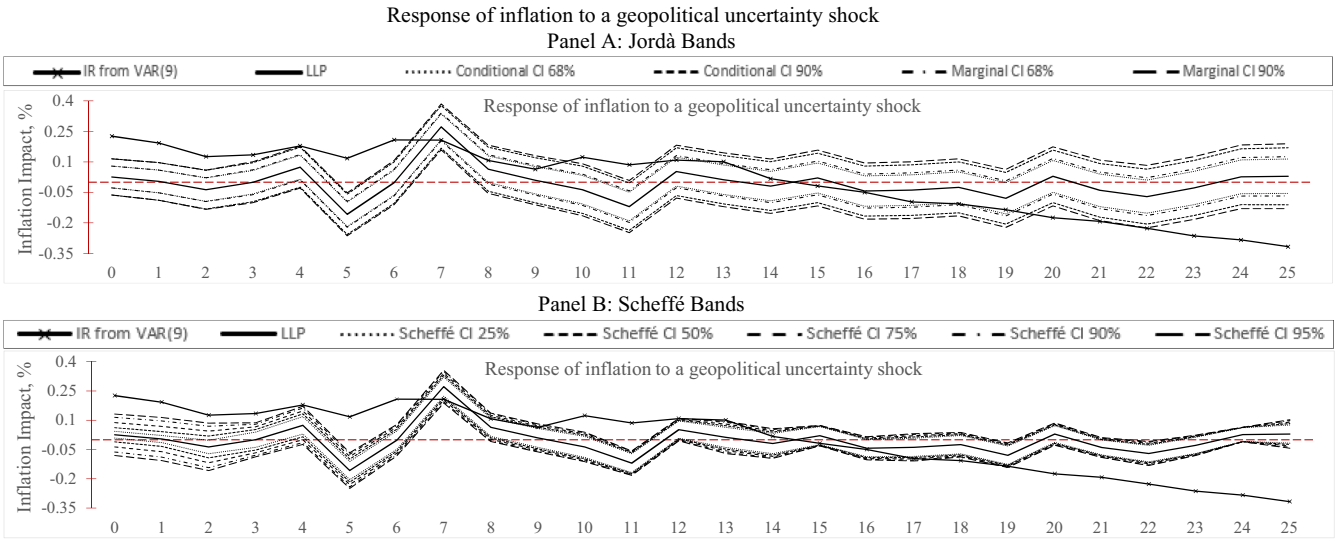


FIGURE 4 | Impulse response of inflation from VAR-9 and local projections. Response of inflation to a geopolitical uncertainty shock. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

because the economy has been suffering from policy-related economic uncertainty and inflationary shocks caused by the misconducted central political administration since the current government came to power in 2002.

Figure 4 plots the response of inflation to a one standard deviation uncertainty shock from both geopolitical uncertainty and risk estimated by VAR-9 and the LLP. For most periods, the confidence intervals include zero, which means that the hypothesis that the true values of impulse responses of the LLP are equal to zero cannot be rejected. However, inflation increases significantly in response to an increase in geopolitical uncertainty in the 4th, 7th, and 28th months and decreases significantly in response to an increase in geopolitical uncertainty in the 5th, 11th, 19th, and 32nd months, according to the conditional, marginal, and Scheffé bands.

In both panels of Figure 4, there is clear evidence of overshooting when impulse-response coefficients of the VAR-9 are estimated. This means that inflation initially increases (or decreases) in response to a geopolitical uncertainty shock before reverting to its baseline level over time.

In Figure 4, inflation responds within varying degrees to geopolitical uncertainty shocks, drawing the complex relationship between these two variables. This aligns with existing theories on the inflation–unemployment trade-off, where geopolitical uncertainty may contribute to inflationary pressures by increasing risk premiums and cost uncertainty in markets (see e.g., Caldara and Iacoviello (2022b) and Baker et al. (2020)).

5.2 | Alternative Measure of Aggregate Uncertainty Shocks (Geopolitical Risk: GPR Index)

To assess the robustness of our empirical findings to alternative uncertainty measures, we incorporate an English language-based uncertainty index, the Geopolitical Risk (GPR) index for Türkiye, developed by Caldara and Iacoviello (2016). The GPR index is widely used in the literature as a proxy for geopolitical uncertainty, allowing us to compare the results derived from Turkish-language sources with those obtained using an internationally recognised uncertainty measure.

The point estimates from the GPR in Figure 5 are not in line with the empirical findings presented in Figure 3. Specifically, an unexpected increase in geopolitical risk seems to lead to increases in industrial production according to the impulse response (IR) estimates from both VAR-9 and the LLP. However, the VAR-9 IR indicates that production decreases between the 3rd and 7th months after the shock. Toward the end of the horizon, the production impact estimated by the LLP rises significantly—by approximately 1.20%—according to conditional bands and the marginal 68% band, while the impact estimated by the VAR-9 IRs reaches around 3.50%. These results sharply contrast with those obtained from the GCSU estimates, suggesting fundamental differences between the two uncertainty measures.

A similar pattern is observed for trade, mirroring the production response. Interestingly, the VAR-9 IR estimates for the GPR index mostly fall within the confidence bands, indicating that while point estimates suggest an effect, their statistical significance remains limited.

When considering Scheffé bands, the point estimates for the GPR index are not statistically significant, as the confidence intervals mostly include zero. This implies that the null hypothesis—that the true values of the impulse responses are equal to zero—cannot be rejected.

All in all, we cannot confirm the impact of geopolitical risk shocks on industrial production and trade within the scope of economic theory (countercyclicality), as the case of employing an alternative measure of uncertainty. This discrepancy highlights the challenges of employing alternative measures of uncertainty. It means that using English as the medium language

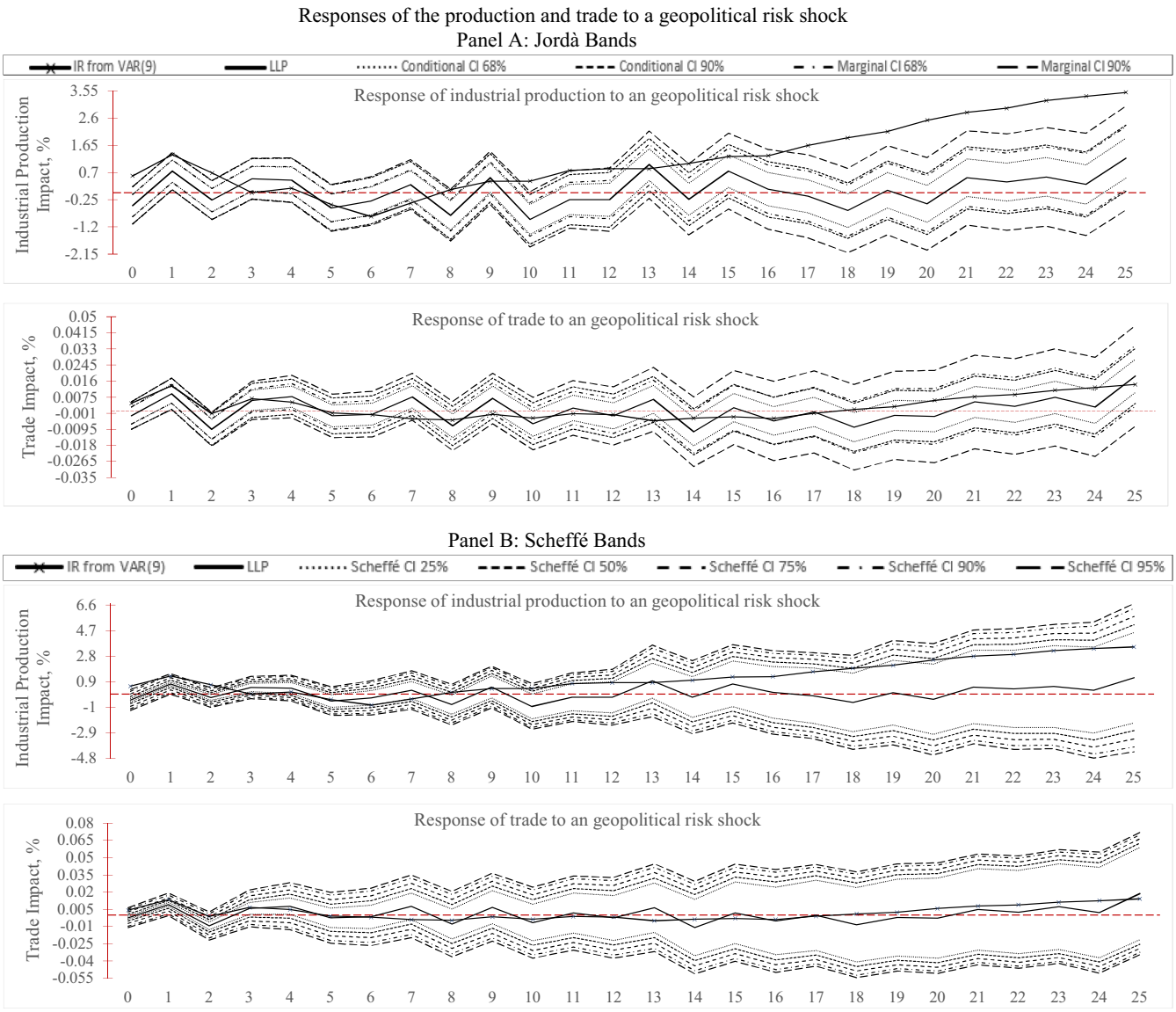


FIGURE 5 | Impulse responses of industrial production and trade from VAR-9 and local projections. Response of the production and trade to a geopolitical risk shock. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

for the resources-GPR index by Caldara and Iacoviello (2022b) produces controversial results while testing the theory of Bloom's hypothesis. Given this, uncertainty indicators derived from Turkish-language sources provide a more reliable tool for estimating the real impact of geopolitical uncertainty on economic activity in Türkiye. These measures can also be useful for monetary and fiscal policymakers, investors, and risk and policy analysts, and using them can give a more transparent assessment of uncertainty in economic practice, especially for long-term contracts, which can in turn mean lower transaction costs than those following an incorrect assessment of uncertainty.

The contrasting results between the GPR and GCSU estimates in Figures 3 and 5 underscore the significance of methodological differences in uncertainty measurement. This divergence points to the need for more refined and country-specific indexes, aligning with the idea that uncertainty's economic impacts are not universal and must be tailored to local contexts (Bloom 2009; Jurado et al. 2015; Baker et al. 2016).

5.3 | 'Geopolitical Uncertainty' Versus 'Economic Confidence'

We investigate the extent to which the estimated impact of geopolitical uncertainty captures the response of economic activity to an increase in geopolitical uncertainty versus the response to increased uncertainty caused by negative news. We hypothesise that rising uncertainty is associated with an increase in negative news coverage. Given this, an unexpected change in 'uncertainty' could, in part, reflect an unexpected change in 'confidence.'

To examine this relationship, we follow Baker et al. (2011) and estimate a monthly VAR model from January 2006 to February 2022. We use identification based on the months of lags with 90% confidence bands obtained by Hall's bootstrap applied to the residuals of the VAR model for 1000 resampling impulses and a Cholesky decomposition to recover orthogonal shocks with the following ordering: our *uncertainty index (GCSU)*, *stock*

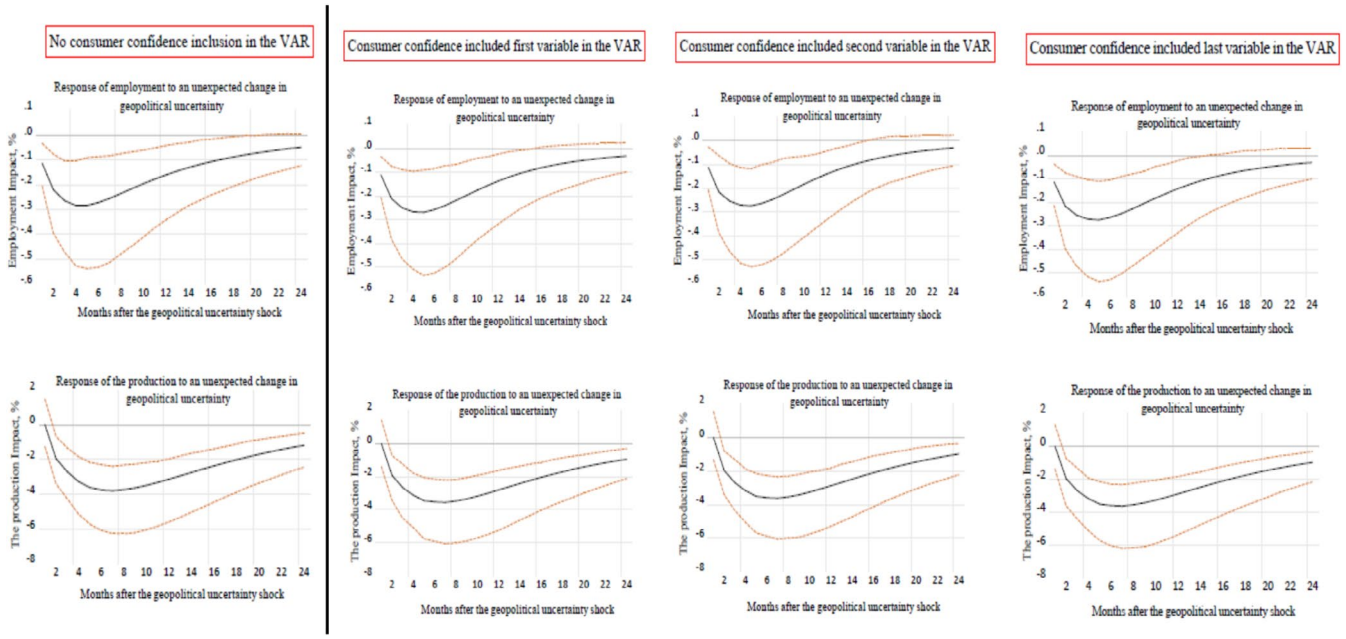


FIGURE 6 | Employment and Industrial production estimates after including controls for consumer confidence. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

price, *interest rate*, *employment*, and *industrial production*, all of which are stationary according to the *p*-values of the Phillips–Perron (PP) test. We used two months of lags (as *HQ* and *FPE* suggested) for all variables.

As a robustness check, we include the index of consumer confidence from the electronic data delivery system (EDDS) of the Central Bank of the Republic of Türkiye (CBRT) (Electronic Data Delivery System (EDDS) 2023). This index was derived from the Consumer Tendency Survey, which aimed to reflect consumers' assessments of their financial situation, the general economic outlook, and their consumption and saving tendencies. In Figure 6, we present results for three different specifications: (i) including the 'confidence' index as the first variable before uncertainty (GCSU), (ii) including it as the second variable after uncertainty, and (iii) including it as the last variable in the VAR.

In all cases, the estimated impacts on employment and industrial production are lower when consumer confidence is included in the model, suggesting that consumer confidence plays a vital role in explaining economic activity. However, industrial production still shows a persistent decline after a geopolitical uncertainty shock, indicating that geopolitical uncertainty has significant additional predictive power beyond what is captured by consumer confidence. This confirms that our geopolitical country-specific uncertainty measure remains a valuable tool for understanding the nature of economic activity in Türkiye, even when accounting for consumer sentiment.

Including consumer confidence in Figure 6 significantly modifies the estimated impacts on employment and industrial production, highlighting the importance of sentiment in shaping economic responses. This suggests that while geopolitical uncertainty may drive macroeconomic effects, consumer confidence also plays a crucial role in determining the extent of these impacts, as recommended by existing behavioural and macroeconomic uncertainty models (Carroll et al. 2011; Baker et al. 2011).

5.4 | Sensitivity Analysis

The estimated effects of geopolitical uncertainty on industrial production and trade remain robust across various model specifications, including orthogonal impulse responses, impulse responses obtained through local projections, reverse Cholesky ordering, and alternative VAR specifications. Figure 7 presents the results of a sensitivity analysis examining how industrial production and trade respond to an unexpected increase in geopolitical uncertainty. Specifically, we display impulse responses without confidence intervals from local projections across different lag specifications, employ reverse Cholesky ordering to estimate orthogonal shocks, and analyse a bivariate VAR model incorporating our uncertainty measure alongside either industrial production or trade.

To enhance the robustness checks, each specification in Figure 7 was estimated using the same dataset and period (January 2006 to February 2022). We applied the Phillips-Perron test to ensure stationarity of all variables before estimation. The local projection approach was estimated using various lag lengths (1 to 6 months), and for the Cholesky decomposition, we reversed the baseline ordering to test the sensitivity of the orthogonal shocks to the ordering of variables. Additionally, bivariate models allowed us to isolate the direct effect of uncertainty on each macroeconomic variable without confounding effects.

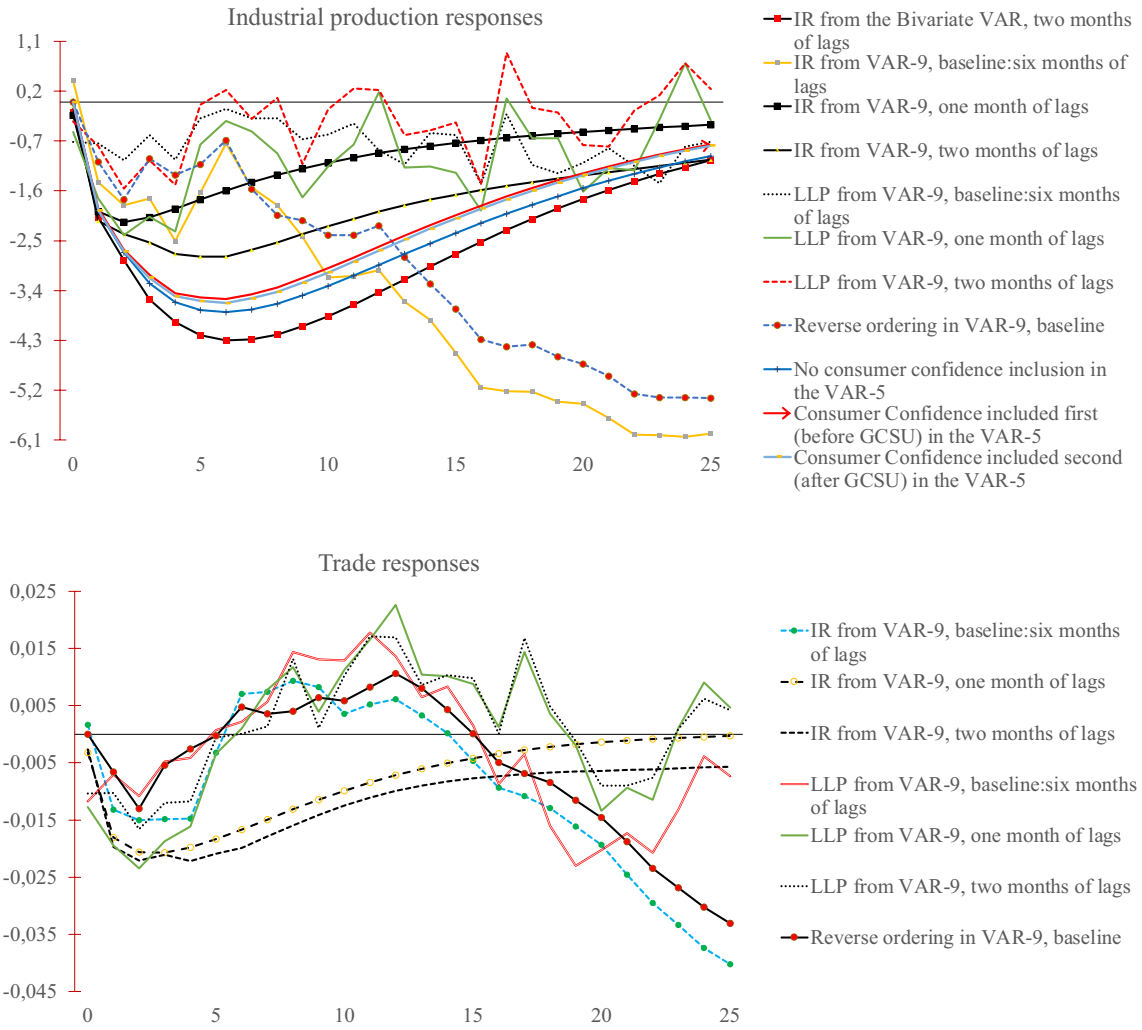


FIGURE 7 | Robustness of estimates to different VAR specifications. *Source:* own construction. [Colour figure can be viewed at wileyonlinelibrary.com]

The alternative orderings and varying lag lengths yield responses of industrial production and trade to an unexpected uncertainty shock from the GCSU Index that closely align with those estimated in each panel of Figure 7. This confirms the countercyclical nature of uncertainty in economic theory when the GCSU Index is used.

Building on this, we conduct a 9-variable monthly stationary macro-VAR analysis using our forward-looking geopolitical uncertainty index to assess its predictive power as a potential driver of real economic activity and financial markets. Employing Cholesky orderings to cover orthogonal shocks and local projections, our estimates indicate that an unexpected increase in uncertainty is likely to lead to declines in industrial production in the range of approximately −5.99% and −0.71%, respectively, and trade is estimated to contract by the range around −0.040% and −0.0073%, respectively. These findings underscore the significant impact of geopolitical uncertainty in driving economic slowdowns and potential recessions.

The robustness of the estimates in Figure 7 across different VAR specifications confirms the countercyclical nature of geopolitical uncertainty. This supports the broader uncertainty literature, which suggests that uncertainty shocks, particularly those related to geopolitical risk, tend to depress economic activity and can lead to slow growth or recession, especially in emerging economies (see e.g., Bloom 2009; Jordà et al. 2015; Baker et al. 2016). While confidence bands are not plotted in Figure 7 for visual simplicity, robustness was assessed based on the consistency of point estimates across alternative models and specifications.

The results across Figures 3–7 indicate that geopolitical uncertainty has significant economic implications, especially for industrial production, employment, trade, and inflation. These findings align with existing theories in the uncertainty literature, which explain how uncertainty shocks, particularly those arising from geopolitical events, can reduce investment, disrupt economic activity, and slow down growth (see e.g., Bloom 2009; Fernández-Villaverde et al. 2015; Baker et al. 2016).

Nevertheless, several limitations should be considered. Despite the implementation of multiple robustness checks, the analysis remains subject to model specification choices, such as the selection of lag lengths and the ordering of variables in the VAR

framework. Moreover, the forward-looking nature of the GCSU index may generate anticipatory effects that are difficult to isolate from contemporaneous macroeconomic fluctuations. As in most empirical studies on uncertainty, issues such as measurement error and data revisions could also affect the accuracy of the estimates. Acknowledging these limitations situates our findings within a broader analytical context and underscores a more cautious interpretation.

By considering both local and international perspectives, our study provides valuable insights into the nature of uncertainty in Türkiye, emphasising the importance of using country-specific indexes for more accurate predictions of economic outcomes.

6 | Conclusion and Discussion

6.1 | Key Findings and Interpretations

In this paper, we introduced a new time series measure of geopolitical uncertainty, the GCSU index. We used Turkish sources rather than international ones to capture the policy-related economic uncertainty in the Turkish economy. This makes our measure a country-specific index. Meanwhile, three descriptors, which are basic components of the index, come from language-specific bases in Turkish. Given this, the GCSU index is constructed for the first time in the literature.

The GCSU shows some peaks around elections, referendum, geopolitical events, and economic, financial, and policy crises. We also find that those unexpected changes in uncertainty cover the high-frequency variation in overall economic and geopolitical uncertainty in the past 16 years in Türkiye.

The GCSU index, which was constructed using recent advancements in artificial intelligence and machine learning, is more forward-looking than those indexes based on conditional volatility from macroeconomic indicators. Our index also differs from commonly used proxies such as the GPR-Türkiye, the EPU-Türkiye, and stock market volatility. More precisely, the GCSU is not a volatility measure, as volatility differs conceptually from uncertainty.

Our VAR estimates suggest that uncertainty measured using Turkish sources is more strongly countercyclical than that captured from English-language sources. This result is statistically significant but only holds when the uncertainty is measured using local-language media. In brief, local-language indexes prove superior to their English-language counterparts. So far, the Friedman-Ball hypothesis has been tested primarily using narrow inflation risk concepts, that is, conditional variance or volatility. However, our broader Knightian interpretation of uncertainty provides a novel perspective, yielding a positive verification of the Friedman-Ball hypothesis.

The main contribution of this paper is not only the documentation of novel empirical findings, but also the demonstration that country-specific indexes built from local resources can produce more accurate predictions and meaningful estimates. These country-specific indexes show greater predictive power compared to those derived from international sources. Countries with non-English local media can, therefore, build more effective uncertainty tools by relying on domestic-language-based indexes.

6.2 | Policy Implications and Future Research

In this context, the strong empirical link between geopolitical uncertainty and key macroeconomic variables such as industrial production, trade, inflation, and employment has significant implications for policymakers in Türkiye. Specifically, the results indicate that economic policy design should include early warning systems for uncertainty shocks, especially those caused by geopolitical events. This might involve integrating forward-looking uncertainty indexes—like the GCSU—into macroprudential monitoring frameworks, policy discussions, and central banking strategies. Using such tools within inflation targeting regimes, fiscal risk assessments, and employment stabilisation programmes could help policymakers reduce the real impact of uncertainty shocks.

Furthermore, the findings emphasise the importance of transparency and effective communications to lessen the amplification of uncertainty during political or geopolitical crises. Policymakers should focus on strengthening the resilience of public institutions and ensuring the credibility of policy responses, especially during elections or outside conflicts, to prevent volatility from spreading into the wider economy.

From a broader policy view, the countercyclical nature of geopolitical uncertainty means that automatic stabilisers and discretionary policies should be better adjusted to respond quickly during times of increased uncertainty. Social protection programs and labour market policies can also serve as buffers by supporting groups most vulnerable to economic disruptions.

Looking ahead, the methodological approach used in this study emphasises the increasing potential of AI-driven tools to serve not only as analytical instruments but also as strategic assets for policymaking. Therefore, investing in national-level technological infrastructure and strong data governance frameworks could greatly enhance the ability to monitor uncertainty and develop more responsive policies across various sectors. While the findings offer valuable insights, there are still multiple areas for future research. Building on the empirical evidence presented here, future studies might explore key directions, especially by utilising emerging technologies to further analyse the economic effects of geopolitical uncertainty.

First, incorporating of artificial intelligence (AI) and machine learning (ML) techniques, especially large language models (LLMs), into the construction of geopolitical uncertainty indexes could greatly improve predictive accuracy. Recent advancements in LLMs provide promising tools for processing large volumes of textual data with better contextual understanding. These models could be used to improve the classification of geopolitical uncertainty signals, extracting subtle economic sentiments from a wide range of media sources, including government statements, policy documents, financial reports, and even real-time social media discussions. By using

multilingual LLMs, future research could evaluate how well country-specific uncertainty measures work across different languages and cultures.

Second, future studies could explore the applicability of the GCSU index across different economies, particularly emerging markets where geopolitical risks tend to be more pronounced. Comparative analyses could test whether local-language-based uncertainty measures outperform traditional indexes constructed using international sources, similar to the findings for Türkiye. Additionally, a cross-country panel study could offer deeper insights into how geopolitical uncertainty spreads across economies with different institutional structures.

Third, exploring alternative data sources and high-frequency economic indicators could enhance the measurement of uncertainty. Using blockchain-based data validation systems might also improve the transparency and reliability of uncertainty indexes, helping to reduce biases and misinformation in media-based uncertainty measures.

Finally, policymakers and financial institutions could benefit from further research on how AI-driven uncertainty indexes like the GCSU can be integrated into macroeconomic forecasting models and central bank decision-making. Understanding how geopolitical uncertainty interacts with policy tools—such as monetary and fiscal policies and investor behaviour could lead to more adaptable economic strategies. Given the countercyclical nature of uncertainty, these tools could help develop automated early-warning systems that allow policymakers to proactively address economic disruptions.

These future directions highlight the transformative potential of LLMs, AI, and alternative data methods in uncertainty research, paving the way for more accurate forecasting, better economic policies, and deeper insights into the changing landscape of geopolitical risks.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] Earlier version of this paper is presented in the seminar 'Geopolitical Uncertainty and Its Macroeconomic Effects: The Case of Turkey', which was held on January 16, 2017, at Vistula University (AFiBV) in Warsaw, Poland. To our knowledge, it was, at that time, the first country-specific (Turkish Language) uncertainty index. I secondly presented in the Bamberg Research Group on Behavioural Macroeconomics (BaGBeM) Brownbag Seminar to the research group of Prof. Dr. Christian R. Proaño at Otto-Friedrich-University of Bamberg in Germany. The presentation with the title 'Macroeconomic Uncertainty: Introduction to the problem and literature' took place on April 13, 2018. I thirdly presented in the workshop 'Measuring Economic Policy Uncertainty in Turkey' to the research group of Prof. Dr. Peter Winker at the Justus-Liebig University of Giessen in Germany on February 6, 2019. I fourthly presented 'Geopolitical Uncertainty and its Macroeconomic Effects on the Economic Performance of Germany' at the Academics in Solidarity (AiS) Network Conference and Skills Workshop on 30–31 October 2019 at Cologne University in Germany. I finally presented at the Academics in Solidarity (AiS) Network Conference: 'Regaining Lost Knowledge-Connecting Research at Home and in Exile' at Berlin Freie University on 21–22 November 2019 in Germany.

[2] In searching for the selected keywords, we used the database of the Media Monitoring Corporation (MTM: Media Takip Merkezi) with the automation system of MTM: full-text search platform of SLR-SQL (Structured Query Language) by Apache Software Foundation. For more info about the corporation, please look at https://medyatakip.com.tr/en/.

[3] More precisely, the GCSU and the inflation were respectively used instead of 'the EPU index of Baker et al. (2016)' and 'the yield on two-year U.S. Treasuries'. For the variables consumer confidence, employment, stock price, interest rate, and inflation, we have used stationary data in the form of the percentage change. The rest of the variables are already stationary in levels in Table A2.

[4] Codes are available upon request.

[5] For more information, please look at our algorithm in Table A2 in Appendix A.

[6] In the survey, we asked three questions to the experts at our target as was indicated in the text:

What does 'Economy' or 'Economics' mean in Turkish to consider media jargon and language literature?

What does 'Policy' mean in Turkish to consider media jargon and language literature?

What does 'Uncertain' or 'Uncertainty' mean in Turkish to consider media jargon and language literature?

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Appendix A

Descriptors: Economy, Policy, and Uncertainty

Descriptor {Economy}

To construct an uncertainty index, we use 30 language-specific keywords that directly relate to the 'economy and its synonyms'. In considering the Turkish media or press and the language, we sought such terms as economic, economics, supply, demand, GDP, GDP per capita, inflation, growth, employment, commerce, commercial, labour force, industry, and so on.

Descriptor {Policy}

There are 210 language-specific keywords in the policy descriptor that directly related to internal and external policy actions and geopolitical developments. The term set was developed to measure geopolitical uncertainty and its real effects on the economic performance of Türkiye. These policy terms, include policy, central bank, legislation, regulation, president, prime minister, parliament, congress, budget, government debt, deficit, election, state of emergency, Turkish army forces, coup, corruption, tax, system, embargo, migration, referendum, war, terror, interest and WTO, are tallied in newspaper articles, passages, and discussions from January 2006 to April 2022.

The appearance of at least one of these policy terms in the newspaper for each date is counted as 'GCSU=1' by the researcher; 'GCSU=0' otherwise.

Descriptor {Uncertainty}

Uncertainty is shown by words like a slowdown, indeterminateness, collapse, risk, shock, crisis, fluctuation, questionable, unclear, balloon, stagnation, insure, expectation, ambiguity, and so forth in both the Turkish language and the jargon of the media and press in Türkiye. Equally, 'uncertainty' was recorded as a crisis, risk, unclear, vagueness, shock, stagnation, fluctuation, and so on in the Turkish media.

However, we properly extend the 'uncertainty' category to 94 uncertainty-related keywords in the language, the media, and the press. If we only used the Turkish words meaning 'uncertain' or 'uncertainty' or 'uncertainties', our measure might reflect superficial inference due to the language structure. However, it is possible to obtain quite substantial results for the country-specific perspective of various word structures in the Turkish language and culture.

The Turkish language comes from a family of languages where there can be possible variations in word meanings, so that some words might indicate uncertainty indirectly with various affixes. Another problem is the jargon of the media and newspapers, where a journalist can give several important messages that are cultural and language-specific. All these factors are crucial for determining a proper term set for the measure of uncertainty in Turkish. In this case, language-specific 'uncertainty' terms are applied in this descriptor, particularly.

The EPU-type newspaper-based uncertainty indexes constructed in the way discussed above may not fully measure a substantial increase in uncertainty during the pandemic. To quantify uncertainty related to the coronavirus crisis, we expand the 'uncertainty' descriptor to cover words related to the pandemic. Thus, we added some selected terms in our algorithm to estimate to what extent the last developments in uncertainty affected dynamics in the economy. The terms[5] are COVID-19, corona, coronavirus, pandemic, and epidemic, as in Charemza et al. (2022b), Ahir et al. (2022), and to some extent of Baker et al. (2020). Consequently, such terms are a distinctive feature of our uncertainty index (the GCSU) compared to those indexes constructed under the methodology of the EPU-type newspaper-based uncertainty measures. With that in mind, GCSU is also different from existing uncertainty indexes for Türkiye in the literature for the following reason: when we were deciding to select keywords for the descriptors of the index, we not only used the dictionary equivalence of them but also applied a survey to give the final shape to keywords in each descriptor for some university professors and editors of economy services in the newspapers in Türkiye. In the survey, we tallied responses for each question[6]. After that, we wrote our augmented keywords in descriptors with respect to the survey contributions, as seen in our idiosyncratic algorithm in Table A1. So, the GCSU is the first index to measure geopolitical uncertainty for Türkiye in the literature.

In order to construct the GCSU index as a geopolitical uncertainty measure for Türkiye, the triple of 'economy', 'policy', and 'uncertainty' was searched in each newspaper for each day. We coded GCSU = 1 in the index if at least one term from each descriptor in this triple was counted in the same edition of a newspaper on one day. These were our criteria, in essence. For the index, there is an algorithm related to the search query about our criteria above in the monitor of Structured Query Language (SQL) in Table A1.

TABLE A1 | Algorithm for Geopolitical Country-Specific Uncertainty (GCSU) Index: search query on the screen of Structured Query Language (SQL).

Search-1 for the horizon between 01:2006 and 12:2019

Text: (Ekonomi OR Ekonomik OR İktisat OR İktisadi OR Tasarruf OR Endüstri OR Sanayi OR Sanayileşme OR Üretim OR İmalat OR Emek OR İşgücü OR Ticaret OR Ticareti OR Ticari OR Arz OR Talep OR Faaliyet OR İş OR İşletme OR 'Alım Satım' OR Rant OR Enflasyon OR Tefe OR Tüfe OR 'Gayri Safi Yurtiçi Hâsıla' OR (GSYH) OR 'Kişi Başı Milli Gelir' OR Büyüme OR İstihdam OR Devalüasyon) AND text: (Siyasi OR Siyasal OR Siyaset OR Siyaseti OR Siyasetçi OR Siyasiler OR Politik OR Politika OR Politikacı OR Politikalar OR Politikaları OR Politikası OR Devlet OR Önlem OR Önlemler OR Önlemleri OR Tedbir OR Tedbirler OR Tedbirleri OR Cumhurbaşkanı OR Cumhurbaşkanlığı OR 'Cumhurbaşkanlığı Külliyesi' OR Beştepe OR 'Çankaya Köşkü' OR 'Recep Tayyip Erdoğan' OR Başbakan OR Başbakanlık OR 'Maliye Bakanı' OR 'Maliye Bakanlığı' OR 'Merkez Bankası' OR Başkanlık OR 'Avrupa Birliği' OR AB OR Hükümet OR İdare OR Yönetim OR Yönetme OR Rejim OR Yetkili OR Yetkililer OR Meclis OR Parlamento OR Kongre OR Toplantı OR Toplanma OR Parlamenter OR Parlamenterler OR Milletvekili OR Milletvekilleri OR Bütçe OR Bilanço OR Harcama OR Harcamalar OR Harcamaları OR Borç OR Borçlar OR Borçları OR Borcu OR Borçlanma OR Masraf OR Masraflar OR Masrafları OR Dezavantaj OR Eksiklik OR Açığı OR Açıklık OR 'Dış Ticaret' OR Gelir OR Gelirler OR Gelirleri OR Gider OR Giderler OR Gelirleri OR Giderleri OR Mevzuat OR Mevzuatlar OR Düzenleme OR Düzenlemeler OR Düzenlemeleri OR Düzenleyici OR Düzenleyiciler OR Kural OR Kurallar OR Ayarlama OR Yönetmelik OR Yönetmelikler OR Yönetmelikleri OR Yasa OR Yasalar OR Kanun OR Kanunlar OR Yasama OR Yürütme OR Seçim OR 'Olağanüstü Hal' OR OHAL OR 'Türk Silahlı Kuvvetleri' OR TSK OR Darbe OR 'Askeri Müdahale' OR Rüşvet OR Yolsuzluk OR '17 Aralık' OR '25 Aralık' OR '17 ve 25 Aralık' OR Vergi OR Vergiler OR Vergileri OR Vergisi OR Vergilendirme OR Vergilendirilir OR Vergilendirilmiş OR Tüzük OR Sistem OR Düzen OR 'Örtülü Ödenek' OR 'Fiyat İstikrarı' OR 'Para Arzı' OR Ambargo OR Dolar OR Avro OR 'Avro Bölgesi' OR 'Euro Bölgesi' OR Fed OR 'Avrupa Merkez Bankası' OR ECB OR 'Terörle Mücadele' OR Avrupa OR Asya OR Rusya OR Suriye OR İsrail OR Ukrayna OR Göç OR Göçmen OR 'Yeni Anayasa' OR Referandum OR 'Kuvvetler Ayrılığı' OR Milli OR Savaş OR Terörizm OR Terör OR PKK OR IŞİD OR PYD OR HAMAS OR Fon OR Fonlar OR Fonları OR Fonu OR Faiz OR Reform OR Reformlar OR Reformaları OR Reformcu OR Reformu OR Plan OR Planlama OR Program OR Döviz OR Kur OR Parite OR Oran OR İhracat OR İthalat OR İşsizlik OR 'Dünya Ticaret Örgütü' OR WTO) AND text: (Belirsiz OR Belirsizlik OR Belirsizlikler OR Belirsizliği OR Karar OR Kararsız OR Kararsızlık OR Kararsızlıklar OR Kararsızlığı OR Şüphe OR Şüpheli OR Kuşku OR Kuşkular OR Kuşkulu OR Durgun OR Durgunluk OR Durgunluklar OR Durgunluğu OR Duraklama OR Duraklamalar OR Çalkantı OR Çalkantılar OR Muallâk OR Muallak OR 'Kesin Olmayan' OR Dalgalanma OR Dalgalanmalar OR Değişkenlik OR Değişkenlikler OR Değişkenliği OR 'Önünü Görememek' OR 'Önünü Görememe' OR 'Askıya Almak' OR Uçuculuk OR Durdurmak OR Durdurma OR Beklenti OR Beklemek OR Beklentiler OR Bekleniyor OR Bekleniyordu OR Eşitsizlik OR Daralma OR Daralmalar OR Yavaşlama OR Yavaşlamalar OR Zayıflama OR Zayıflamalar OR İstikrarsız OR İstikrarsızlık OR Konjonktür OR Balon OR Oynaklık OR 'Soru İşareti' OR 'Soru İşaretleri' OR Güvenilmez OR Güvenilmezlik OR Güvenilmezliği OR Kuşkulu OR Tartışma OR Tartışılabilir OR 'Tartışmaya Açık' OR 'Kesin Olmayan' OR 'Açık Olmayan' OR 'Net Olmayan' OR Güvensiz OR Güvensizlik OR Güvensizlikler OR Güvensizliği OR Askıda OR 'Karara Bağlanmamış' OR Kararlaştırılmamış OR Ani OR Öngörülemeyen OR Öngörülemezliği OR Beklenmeyen OR Beklenmedik OR Değişiklik OR Şok OR Risk OR Riski OR Riskler OR Riskleri OR Riskli OR Tereddüt OR Tereddütler OR Tereddütleri OR Kriz OR Krizi OR Krizler)

Search-2 for the horizon between 01:2020 and 04:2022

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Source: Authors' own construction.

The macroeconomic variables of monthly consumer confidence, industrial production, employment, trade, stock price, interest rate, and inflation are obtained from the electronic data delivery system (EDDS) of the Central Bank of the Republic of Türkiye (CBRT), where a large number of economic and financial indicators are served for academic and other purposes. These indicators are statistically ready for practitioners working with specific horizons and types to provide plots, diagrams, and figures in the EDDS of the CBRT. Specifically, the consumer confidence index (yearly percentage chances), the employment (the percentage changes), the industrial production (the level of production in manufacturing), the trade (the logarithm of total import plus total export), the stock price (the percentage changes), the interest rate (the percentage changes of discount rate), and the inflation (the percentage changes of consumer price index) are based on the figures from the Turkish Statistical Institute (TURKSTAT). Oil price was obtained from 'Crude Oil WTI Futures Price' available on www.investing.com (Crude Oil WTI Futures Historical Prices 2023). To produce uncertainty indexes, the index for Türkiye of Matteo Iacoviello-Geopolitical Risk (GPR) Index was first taken from www2.bc.edu, and then our construction uncertainty index was used separately. Our uncertainty index has already been described in detail in the third main title: 'Construction of the Geopolitical Country-Specific Uncertainty (GCSU) Index for Türkiye', where its methodology and sources were comprehensively discussed. The monthly data span for all indicators runs from January 2006 to February 2022, as seen in Figure A1.

When applying the test of stationarity, we first checked whether the probability values (*p*-values) of the industrial production series include *constant*, *trend and constant*, and *none* in EViews 12 edition. This means they are individually tested by being put in the test equation to capture a unit root at the 5% or 10% level. Industrial production (the production in manufacturing) clearly contains all of them in the ADF rest results in Table A2, meaning it is not stationary at the level form according to the ADF test of probability values. If the data are stationary at the level form, there is no need to change their level, as can be seen in the PP test probability values for the production. More precisely, the *p*-value of the production is greater than 5% at the level form in the ADF test values. So, the null hypothesis of a unit root cannot be rejected because there is a unit root. However, it is stationary in its level form in the PP test results because the null hypothesis of a unit root can clearly be rejected. Therefore, the PP test results are preferable to the ADF test results for the production time series in Table A2. Employment is stationary because the null hypothesis of a unit root can be rejected in the PP test results.

Geopolitical risk (GPR)-Türkiye and also the GCSU index we computed are stationary *I*(0) in their probability values at the level forms according to these tests. Thus, any differences in these uncertainty indexes were not calculated because the test values are stationary in the level form, as seen in Table A2. In other words, the probability values of these uncertainty indexes are smaller than 5%, so the null hypothesis of a unit

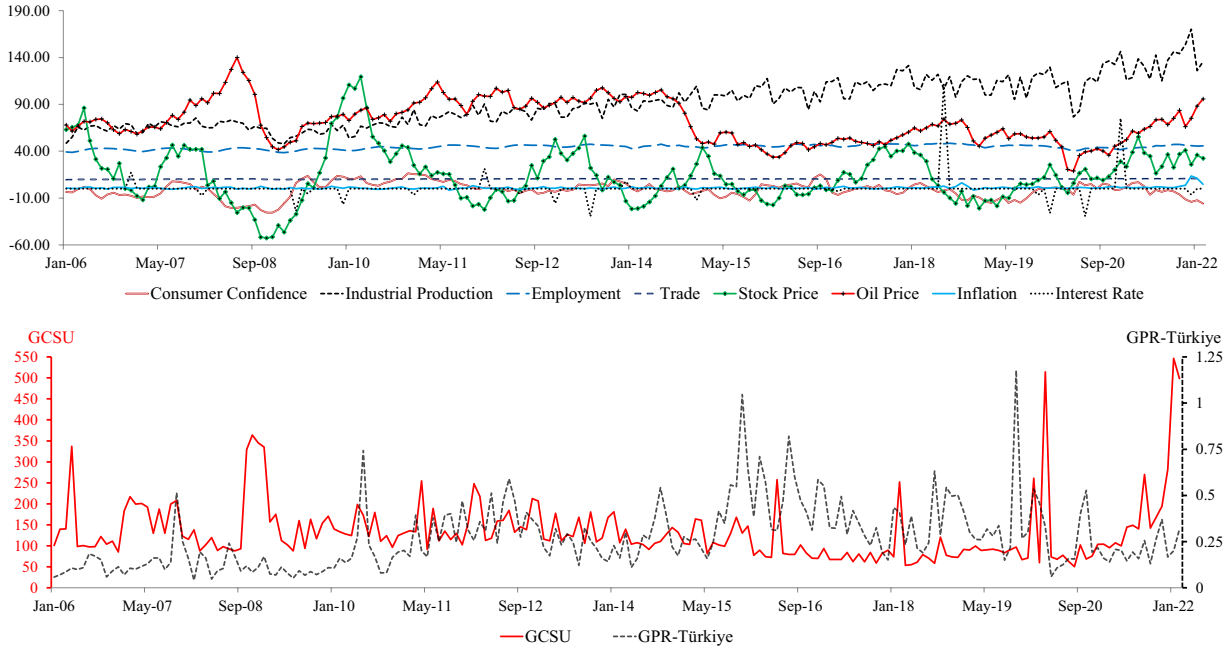

FIGURE A1 | Data description of consumer confidence, industrial production, employment, trade, stock price, oil price, inflation, interest rate, and uncertainty indexes for Türkiye, 2006–2022, monthly. *Source:* All macro variables from the electronic data delivery system (EDDS) of the Central Bank of the Republic of Türkiye (CBRT), oil price from www.investing.com, uncertainty indexes: GPR-Türkiye from Matteo Iacoviell; GPR from www2.bc.edu; GCSU: authors' own computation. [Colour figure can be viewed at wileyonlinelibrary.com]

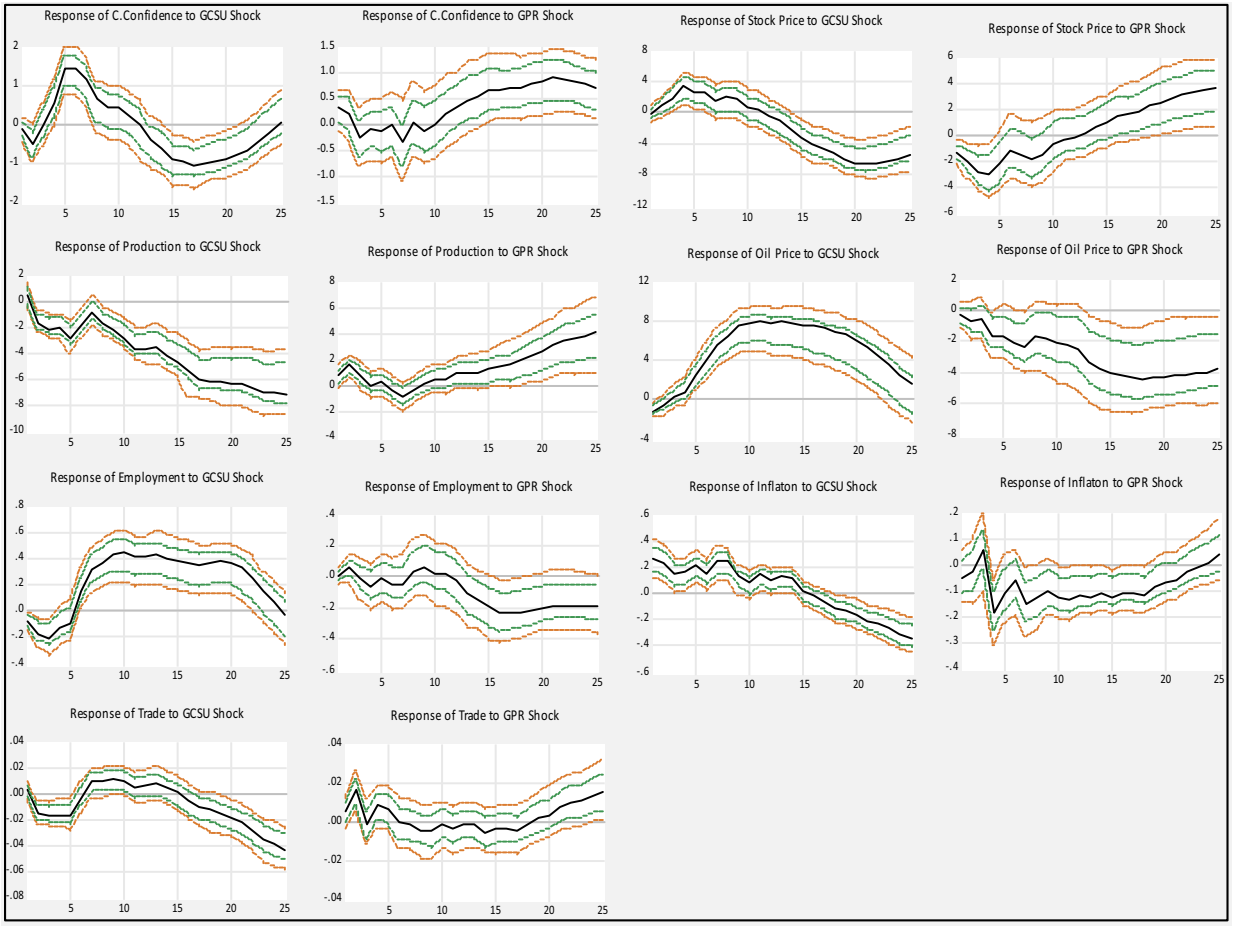

FIGURE A2 | Impulse responses of consumer confidence, industrial production, employment, trade, stock price, oil price, and inflation from VAR-9 together with 90% and 68% confidence intervals. *Source:* authors' own calculations. [Colour figure can be viewed at wileyonlinelibrary.com]

root can be rejected. In brief, both the GPR and the GCSU indexes are integrated of order 0, $I(0)$, before taking any differencing calculation, like $I(1)$ or $I(2)$. The remaining variables are also stationary $I(0)$ according to the test results in Table A2.

TABLE A2 | Phillips–Perron (PP) and Augmented Dickey–Fuller (ADF) Stationarity Tests (Unit Root Tests) for the GCSU, the GPR, consumer confidence, industrial production, employment, trade, stock price, oil price, and inflation, 2006–2022, monthly.

		PP test results, *p*			ADF test results, *p*		
Forms	**Variables**	**Constant**	**Constant and trend**	**None**	**Constant**	**Constant and trend**	**None**
Level	GCSU	0.0000	0.0000	0.0492	0.0032	0.0271	0.3285
	GPR-Türkiye	0.0000	0.0000	0.0029	0.0011	0.0017	0.0785
	Consumer Confidence	0.0109	0.0506	0.0008	0.0019	0.0110	0.0001
	Industrial Production	0.0666	0.0000	0.8760	0.9954	0.5882	0.9983
	Employment	0.0110	0.0123	0.7863	0.3752	0.3459	0.8461
	Trade	0.0081	0.0001	0.9615	0.0591	0.0188	0.9246
	Stock Price	0.0056	0.0323	0.0010	0.0001	0.0006	0.0001
	Oil Price	0.0937	0.2129	0.4882	0.0681	0.1384	0.4961
	Inflation	0.0000	0.0000	0.0000	0.6093	0.4809	0.6680
	Interest Rate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Authors' own computation.

TABLE A3 | Descriptive statistics for consumer confidence, industrial production, employment, trade, stock price, oil price, interest rate, inflation, and uncertainty indexes: the GCSU and the GPR for Türkiye, 2006–2022, monthly.

Descriptive statistics (common sample)										
Sample: 2006M01 2022M02										
	GCSU	**GPR**	**Consumer confidence**	**Production**	**Employment**	**Trade**	**Stock price**	**Oil price**	**Inflation**	**Interest rate**
Mean	133.6214	0.269664	−1.238647	91.74013	44.39845	10.27590	14.39769	71.36356	0.982001	0.198066
Median	111.8667	0.232111	−0.409562	90.27264	44.80000	10.33828	11.08045	68.66500	0.751369	0.000000
Maximum	546.4192	1.177163	16.45408	170.1888	48.50000	10.84543	119.4401	140.0000	13.57549	111.4286
Minimum	50.40649	0.040482	−25.55911	47.98702	38.50000	9.493908	−52.56748	18.84000	−1.442919	−29.62963
Standard deviation	75.88239	0.177807	8.356173	24.75754	2.371538	0.230222	28.88840	22.38645	1.509303	10.86496
Skewness	2.695314	1.656224	−0.469816	0.426315	−0.483653	−0.635885	0.707288	0.285703	4.847023	6.936177
Kurtosis	12.64845	7.400719	3.252533	2.494902	2.421697	3.400184	4.337513	2.483977	37.10204	69.97755
Jarque–Bera	987.3905	245.2373	7.652348	7.938658	10.26675	14.36849	30.63557	4.791668	10160.13	37817.35
Probability	0.000000	0.000000	0.021793	0.018886	0.005897	0.000758	0.000000	0.091097	0.000000	0.000000
Sum	25922.55	52.31488	−240.2975	17797.59	8613.300	1993.525	2793.152	13844.53	190.5083	38.42472
Sum square deviation	1111321	6.101731	13476.35	118296.6	1085.470	10.22941	161066.1	96722.52	439.6532	22783.12
Observations	194	194	194	194	194	194	194	194	194	194

Source: Authors' own computation.