

Macroeconomic Uncertainty in Disruptive Times

Saša STJEPANOVIĆ*

*Juraj Dobrila University of Pula, Faculty of economic and tourism
“Dr. Mijo Mirković”, Pula, Croatia*

**Corresponding author, sstjepan@unipu.hr*

Daniel TOMIĆ

*Juraj Dobrila University of Pula, Faculty of economic and tourism
“Dr. Mijo Mirković”, Pula, Croatia*

dtomic@unipu.hr

Abstract. *In a modern world characterized by frequent economic shocks, technological disruptions, and geopolitical uncertainty, it is imperative that policymakers, businesses, and investors understand macroeconomic uncertainty. This paper tracks macroeconomic uncertainty over the years in some EU countries from 1997-2024 using a data set that includes economic policy uncertainty indices, GDP growth rates, inflation, interest rates and labor market dynamics. We use VAR models and impulse response functions to study the effects of uncertainty shocks on macroeconomic aggregates. We find that there is considerable variation in how EU economies react to uncertainty, with small and open economies being more volatile. Also, we investigate how various economic crises like the global financial crisis of 2008, the eurozone debt crisis, COVID-19, and the current geopolitical tensions have increased uncertainty and changed the transmission mechanisms of macroeconomic shocks. Combining the findings from behavioral economics, we review the role of decision-making biases in economic forecasting and policy making. This paper presents evidence on the trends and consequences of macroeconomic uncertainty over the long-run and recommends policies to change effects and enhance economic opportunities in an environment of growing economic uncertainty.*

Keywords: Macroeconomic uncertainty, EU economies, economic policy uncertainty, vector autoregression, behavioral biases, economic crises, policy responses

Introduction

Macroeconomic uncertainty has become an important predictor of firms' and investors' actions in the context of global shocks. These include technology evolution, political issues, supply chain break, and financial market downturns that increase uncertainty. During such conditions, firms, investors and policy makers are faced with critical issues on the management of resources, uncertainty and strategic planning. Global economic interconnections have increased the complexity of the economic dynamics, which in turn increases the difficulties in forecasting and interpreting macroeconomic trends and thus results in sub-optimal decisions and increased systemic risks. Consequently, since most traditional economic models are unable to capture the magnitude and frequency of exogenous shocks it is crucial to design adaptive strategies that can improve robustness. In addition, the behavioral aspects of economic agents during the presence of uncertainty can lead to the amplification of market dynamics, thus demanding the need for strong macroeconomic frameworks that incorporate behavioral economics. This paper outlines the consequences of macroeconomic uncertainty in disruptive times for corporate strategy, investment decisions, and economic policy making. Based on an analysis of empirical evidence and theoretical literature, this study seeks to contribute to the understanding of how organizations and policy

makers may manage uncertainty to support economic stability and growth. Economic uncertainty is the uncertainty concerning the values of various macroeconomic variables like GDP growth, inflation, interest rates and fiscal and monetary policy uncertainties. It is caused by different factors including geopolitical events, financial crises, technological disruptions and global supply chain disruptions. Where risk can be defined based on historical data and probability distributions, there is no clear probabilistic assessment of uncertainty to incorporate into economic models and decision-making processes. The measurement of macroeconomic uncertainty is a rather challenging task to accomplish since it entails both the perception and the indicators of the volatility of the economic conditions.

Several approaches have been developed to quantify uncertainty at the macroeconomic level:

- Forecast Dispersion – This method measures the degree of disagreement among professional forecasters regarding key economic indicators. A higher dispersion in forecasts indicates greater uncertainty.
- Volatility-Based Measures – Financial market volatility, particularly fluctuations in stock market indices, exchange rates, and bond yields, serves as a proxy for macroeconomic uncertainty. The VIX (Volatility Index) is a commonly used measure of market expectations of future volatility.
- News-Based Indices – Textual analysis of newspaper articles and policy-related statements is employed to construct indices that track the frequency and sentiment of economic uncertainty. The Economic Policy Uncertainty (EPU) index, developed by Baker, Bloom, and Davis, is an example of such an approach.
- Structural Model-Based Approaches – Macro econometric models incorporate uncertainty shocks by estimating the variance of residuals in structural equations. These models help assess the impact of uncertainty on macroeconomic aggregates over time.
- Survey-Based Measures – Direct surveys of businesses and consumers capture subjective perceptions of uncertainty. These surveys provide insights into how economic agents adjust their expectations and behavior in response to perceived instability.

A lot of research has underlined the importance of combining multiple measures to get a clear picture of macroeconomic uncertainty. Since uncertainty impacts investment decisions, consumption patterns and policy effectiveness, it must be measured accurately in economic modeling, forecasting and decision-making at both the corporate and policy levels. Macroeconomic uncertainty has its origins from a number of related factors that disturb economic equilibrium, make forecasting inaccurate, and make decision making difficult for businesses, investors and policy makers. These can be classified more generally as economic, political, financial, technological and external shocks, all of which are sources of uncertainty for key macroeconomic outcomes, such as growth in GDP, inflation, interest rates and employment.

- Economic Policy Uncertainty: Policy decisions regarding fiscal measures, monetary interventions, taxation, and regulation play a crucial role in shaping economic expectations. Uncertainty arises when governments delay decision-making, implement inconsistent policies, or fail to provide clear long-term economic strategies. Sudden shifts in taxation policies, changes in central bank interest rate policies, or unexpected alterations in public spending can lead to volatility in financial markets and business investment behavior.
- Geopolitical challenges and political unrest have an impact, on the landscape and financial markets by causing fluctuations in investor trust and trade patterns worldwide. Changes in

leadership and shifts, in policy frameworks can result in sudden alterations to regulations that affect businesses and investment strategies. The unpredictable nature of relations adds to the economic instability.

- Financial market instability has an impact, on economic uncertainty since things like market crashes and currency fluctuations can disrupt the stability of the economy and affect investment strategies greatly. Moreover when there's uncertainty regarding the stability of banks like issues, with loans or banking crises it can lead to widespread economic problems.
- The evolution of technology and the introduction of automation and artificial intelligence are reshaping industries and job markets through digital transformation processes that raise concerns, about future job opportunities and the need for increased productivity and investments One common consequence of such innovation is the potential for structural unemployment during transitions and shifts, in capital allocation patterns that bring an element of unpredictability to overall economic conditions.
- Global disruptions, in the supply chain caused by disasters or geopolitical conflicts can create uncertainties in production costs and trade balances while also resulting in pressures. The COVID19 pandemic and trade restrictions during times of tensions have highlighted the fragility of supply networks and contributed to economic instability, in various industries.
- Environmental challenges, like weather incidents and the impact of climate change are increasing risks to the economic balance of society. The uncertainties linked to climate issues influence farming productivity, energy costs and the need, for infrastructure development necessitating strategies to lessen future negative outcomes.
- Agents' expectations and behavioral biases play a role, in magnifying uncertainty in the economy. When businesses and consumers foresee instability on the horizon, they tend to hold off on making investments and spending money which further contributes to slowdowns. Additionally, the tendency for herding behavior in markets can result in changes, in asset prices ultimately heightening systemic uncertainty.
- In today's world where economies are closely linked globally one countrys economic issues can swiftly affect others worldwide through events, like currency devaluations or sudden shifts in trade policies leading to uncertainty and challenges, at home.

It's crucial, for policymakers and economic players to use these elements to devise plans and the uncertainties they bring about. There are three areas to consider here: policies, open markets, and stable institutions. In doing economies can strengthen their ability to weather disruptions by enacting measures that lessen susceptibility to market fluctuations. The uncertainty, in macroeconomics significantly influences business decision making resource distribution, and strategic long-term planning. In a setting where the future values of indicators, like GDP growth and inflation are unpredictable and influenced by factors such as interest rates and government decisions companies face increased risks that impact their financial decisions including investment strategies, employment practices, and overall financial stability. The uncertainties, for business activities can be classified into significant areas:

- In times of uncertainty, at a scale like this one it can cause companies to hold off from making investments as they are unsure of the potential returns from such projects due to the unclear future outlooks and probability of success of those ventures; this can then lead to businesses delaying their plans for expansion or growth and limiting their progress in areas like acquisitions or enhancing their infrastructure due to a lack of confidence in market

stability which also makes it harder for them to secure financial support because investors require higher risk premiums, in such situations.

- Consumer and business confidence is decreasing due, to uncertainty which is affecting consumer spending and demand for products and services negatively by causing people to save more and cut back on purchases in anticipation of unstable economic conditions. At the time some companies are cutting back on hiring and production in response to this demand, for the future resulting in further slowing down of the economy.
- In times of uncertainty, businesses may encounter loan expenses because lenders and investors are more wary of risks. Financial institutions tend to be more careful when lending money to medium sized enterprises (SMEs) which can struggle with cash flow issues. Moreover, fluctuations in foreign exchange markets can impact companies negatively as unpredictable currency changes might result in losses, in global trade and investments.
- Supply chain disruptions and cost fluctuations are caused by global trade policies and changes, in regulations due to tensions that affect production costs and operational efficiency negatively for companies worldwide. To deal with varying input prices and delays in transportation as trade barriers poses challenges, in managing inventory and forecasting costs accurately. Companies that operate global supply chains encounter risks in sustaining consistent production levels.
- In times of high uncertainty businesses often pivot from range planning to quick reactive decision-making strategies to adapt quickly to changing conditions instead of investing in innovation and growth initiatives they prioritize risk reduction tactics like slashing costs reducing staff and streamlining operations this tendency, towards short term thinking may decrease companies' competitive edge in the long run and impede economic advancement
- During times of prolonged uncertainty, at a level businesses tend to face higher rates of failure. Especially those with limited financial resources or significant debt burdens. This trend is particularly harsh for startups and small businesses that rely heavily on economic conditions and have less access to outside funding. Sectors such as energy, healthcare, and financial services which rely heavily on frameworks are also at increased risk, during such periods.
- In times of uncertainty businesses focus on managing risks by diversifying income sources tweaking pricing strategies and boosting buffers. They may also change governance practices to incorporate scenario planning, stress tests and flexible decision-making frameworks. Companies, with governance and risk management setups usually fare better during times.
- In times of uncertainty, on a scale like this companies tend to hire conservatively and keep wages stagnant. They also tend to rely on contract workers rather than hiring permanent employees. To cut down on labor expenses and protect themselves from downturn situations businesses might opt for layoffs. Invest in automation which can add to the volatility of the job market and create income instability, for workers.

The impact of uncertainty has reaching effects, across businesses by influencing investment decisions and financial stability as well as impacting employment and strategic planning processes. Companies that implement strategies and enhance flexibility while establishing robust risk management systems are better equipped to navigate the challenges posed by uncertainty. Likewise, government officials also hold a responsibility, in ensuring stability through clear policy

communication and maintaining consistent regulatory frameworks to minimize unpredictability and boost business assurance.

Literature review

More and more, macroeconomic uncertainty has become an important driver of business strategy as well as a guide to policy decisions and financial market behavior and stability. These economic shocks that result from financial crises, geopolitical tensions, pandemics, and technological changes are increasing uncertainty in the macroeconomic environment. As a result, the consequences of macroeconomic uncertainty are critical for policy makers, businesses, and investors to deal with, and avoid the impacts of, uncertainty. The current literature on macroeconomic uncertainty focuses on how to quantify it, how it affects aggregate economic outcomes like gross domestic product (GDP) growth, inflation, and unemployment, and more broadly, how it affects financial markets and policy responses.

The main controversy in the literature concerning quantification of macroeconomic uncertainty remains relevant. Different aspects of uncertainty are captured by several approaches. The Economic Policy Uncertainty (EPU) Index created by (Baker et al., 2016) is widely utilized to gauge policy related uncertainties based on the frequency of terms in leading newspapers. It has proven valuable in assessing the impact of uncertainty, on investments, jobs and economic advancement. Another common method involves incorporating financial market volatility indicators, like the VIX index. The VIX index gauges market anticipation of stock market volatility (Bloom et al., 2009). Other methods include survey-based measures which capture the level of disagreement amongst economic forecasters and structural econometric models such as VAR and GARCH models that capture uncertainty shocks and their impact on macroeconomic aggregates (Stock and Watson, 2012). However, the researchers argue that it is important to combine several measures in order to capture the total impact of macroeconomic uncertainty (Casarin et al., 2020).

The economics literature has also established that macroeconomic uncertainty has adverse effects on economic outcomes, including GDP growth, business investment, and employment. Several studies have found that higher levels of uncertainty deter business investment because companies refrain from making capital expenditures when the economy is uncertain (Bernanke, 1983; Bloom, 2009). For instance, Julio and Yook (2012) have established that political uncertainty, such as that experienced during elections, reduces corporate investment cycles. This behavior is explained by the real options theory, which state that in conditions of high uncertainty about the future, firms will prefer to defer investment decisions in order to keep their options open. These effects also obtain in consumption, with households increasing their savings and reducing their spending on nonessential items in the face of economic uncertainty (Carroll, 1997). The restrain in corporate investment and consumer spending definitely has severe recessionary consequences and may lead to worsening of macroeconomic trends. Economic uncertainty in the macroeconomy is not only important for investment and consumption, but also for monetary policy and interest rates. Central banks are faced with a number of problems in setting optimal monetary policy when uncertainty affects inflation expectations and economic forecasts. Caggiano, Castelnovo and Figueres (2020) have found that high level of economic uncertainty dumbs down the transmission of monetary policy such that interest rate changes are less effective in achieving economic stability. However, uncertainty can increase the risk premiums in the financial markets which means that the cost of borrowing increases for both companies and governments. Bekaert, Hoerova and Duca (2013) have established that there are substantial effects of uncertainty shocks

on market volatility, resulting in capital flows and exchange rate fluctuations. The results obtained from the VAR models reveal that economic policy uncertainty is a key factor in the propagation of financial instability, especially during geopolitical crises and trade conflicts (Pástor and Veronesi, 2013).

Recent years have also seen the rise of the role of behavioral economics in the understanding of macroeconomic uncertainty. Conventional model based economic analyses are usually made with the assumption that individuals and firms are bound to reason in a rational manner when faced with changes in the economy; but there is evidence that behavioral biases play a significant role in the reaction to uncertainty. For instance, Shiller (2000) points out that the herd behavior of investors can amplify financial market fluctuations since individuals mimic the actions of others rather than making decisions based on fundamental analysis. Likewise, Gennaioli, Ma, and Shleifer (2016) argue that there is a tendency of economic actors to overreact to news and policy actions, which lead to market overreactions. Another important factor is the aversion effect where policymakers delay important decisions because of uncertainty regarding the economic results, as found by Guiso, Sapienza and Zingales (2008). These behavioral factors explain that uncertainty is not only external factor but also contains a component of expectations and perceptions. Because of the significant effects of macroeconomic uncertainty, policy makers and business leaders must come up with ways of reducing the risks that come with it. Based on the literature, the following policy recommendations are proposed. Policy makers should ensure that there is transparency and stability in the economic governance. In the first place, governments should stick to the policy of open and clear announcing of the strategies and intentions in order to avoid ambiguity of the future policy measures. Of particular importance are central banks that help to fix inflation expectations and ensure financial market stability through the use of forward guidance and predictable policy actions. Moreover, the strengthening of the institutional factors such as sound fiscal policies and macro regulations can be useful to build the resilience of the economies to uncertainty shocks. For business, adaptive measures including diversification of the revenue base, flexible labor arrangements and enhanced risk management can improve performance in the context of ambiguity. Although the study of macroeconomic uncertainty has made significant progress, there are still some gaps in the literature. Increasing economic complexity and globalization require more elaborate models that would incorporate real time data, artificial intelligence, and machine learning in the forecasting process. Moreover, more study is needed to determine the long-term structural impacts of uncertainty, including those related to climate change, technological change, and population change. These issues can only be solved if the three disciplines of economics, finance, psychology, and data analysis are applied simultaneously. Macroeconomic uncertainty can be seen as a central characteristic of contemporary economies, influencing investment, consumption, monetary policy, and financial stability. Thus, while conventional economic models offer important insights, integrating behavioral considerations and sophisticated econometric methods may help to capture the dynamics of uncertainty. While economies continue to face new and evolving shocks, developing robust ways of managing uncertainty will be vital for sustainable economic growth and resilience.

Methodology

In this paper, we examined data and created a panel VAR model for 17 selected EU countries. These are Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Slovakia, Spain, Sweden for the period from

1997 to 2024. In macroeconomics and finance fields Vector autoregression (VAR) models are often used to explore the interactions, among different time series data points together over time periods simultaneously of having rules about how they relate to each other like in other theoretical models do by assuming all variables are interrelated with only historical data as the external input, for predicting future trends. This analysis proves to be quite valuable, in the field of macroeconomics as it helps economists understand the impacts of influences such as policy adjustments and changes in markets or geopolitical conditions on a range of macroeconomic indicators. The initial phase, in applying VAR involves preparing the data by organizing variables into time series format to ensure that the model reflects connections accurately and allows for meaningful interpretations. One crucial aspect of the VAR modeling procedure involves checking for stationarity because nonstationary time series could lead to inaccurate outcomes and false connections being made between variables. The ADF test is commonly employed to ascertain if the time series is indeed stationary. If the variables are found to be integrated the next step may involve differencing them to achieve stationarity. Once stationarity is confirmed the subsequent task is to select the number of lags for the model. This decision greatly influences the model's accuracy and performance. The lag order is determined using the AIC or SBC criteria. Then the model is estimated by running regressions, for each variable with its lag values and the lag values of all other variables in the system included as well. The coefficients derived from this process show us how each variable influences the variables over time, known as Granger causality. The main advantage of the VAR framework lies in its ability to analyze response functions (IRFs) which illustrate how a shock in one impacts the other variables, within the system. In a scenario, like this one; an unexpected event affecting the Economic Policy Uncertainty (EPU) could lead to shifts in Gross Domestic Product (GDP) inflation rates and the level of turbulence in markets in the medium run period as a result of these changes occurring over time. The Impulse Response Function (IRF) serves as a tool for policymakers and analysts to explore how macroeconomic shocks spread through an economy. The Vector Autoregression (VAR) models also play a role through their Forecast Error Variance Decomposition (FEVD) function which quantifies how much of a variable's variability can be traced back to preceding values of another variable. This method is particularly effective for pinpointing factors that contribute to uncertainty and fluctuations, in indicators. In a scenario where we perform an analysis called FEVD and discover that changes, in the rate are mostly due to fluctuations in interest rates we would understand that the right move, in terms of policy would be to adjust interest rates to maintain stable employment levels.

During times of uncertainty variance autoregressive (VAR) models are quite useful as they offer a way to analyze the intricate relationships, among different macroeconomic factors using data driven methods. As opposed to models that depend on assumptions VAR models allow for more adaptability in grasping real world dynamics without enforcing rigid connections. This makes them well suited for investigating the impacts of occurrences like financial crises changes, in central bank policies and external trade disruptions. VAR models are tools, in analysis as they help researchers examine how different economic factors are connected to each other and measure the effects of unexpected events while enhancing the accuracy of predictions without being restricted by specific theories or limitations in the number of variables used—a feature that is highly beneficial, for policymakers and financial experts navigating unpredictable economic landscapes.

We used an ADF test to analyze factors such, as GDP growth rate and inflation levels alongside interest rates set by European Central Bank (ECB) Economic Policy Uncertainty (EPU) unemployment rates and market volatility measured by VIX index. Results of the analysis indicated

that all variables exhibited p values below 0.05 threshold indicating that they were statistically stationary at significance levels. This suggests that no further adjustments were needed for these variables as they were already stable, in their form. After testing variables, for significance in determining stationarity of time series data sets it was observed that GDP had a p value of 0.0137 which was below but still close to the used 5 % threshold for statistical significance. Additionally other factors such as CPI, ECB interest rate and EPU showed p values compared to GDP indicating strong evidence, against them conforming to a random walk pattern and suggesting nonrandom behavior instead. The findings suggest that the VAR model can be applied directly without data transformation and yields meaningful and precise relationships, between variables estimated within it. Determining the lag length is crucial in VAR modeling as it indicates the extent of influence past values of each variable have on its value. Statistical metrics, like AIC SBC and HQA were utilized in selecting the number of lag terms for the model. The process of selecting lag revealed that the suitable model incorporated a lag length of seven periods (referred to as L7). This indicates that the model considers the impact of factors, up to seven-time intervals – such as months or quarters, in the context of this study’s dataset. By using this lag selection method, it guarantees that there is an amount of data available to understand long term relationships without falling into the trap of overfitting caused by excessive lag usage.

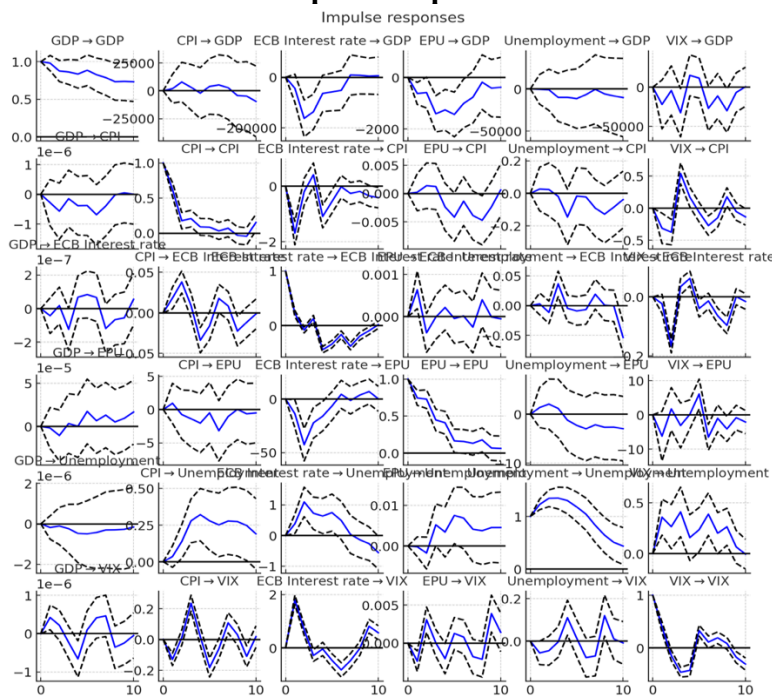
The results of the VAR model estimation are detailed in the following section.

The impact of joblessness and VIX. The delayed figures, for unemployment and financial market volatility (VIX) were observed to influence factors. For example, the coefficient for the delay of unemployment was meaningful implying that past levels of joblessness impact present macroeconomic situations. Similar to this pattern; VIX had a positive influence on EPU indicating the connection, between markets and overall economic stability.

The study’s findings revealed an adverse influence of adjustments, in the ECB interest rate on economic policy uncertainty (known as EPU). This implies that a stricter monetary policy linked to increased interest rates diminishes uncertainty within the economy. Nonetheless the model indicated that the impact of policy on GDP lacked significance suggest that other macroeconomic variables play a more substantial role, in driving economic growth.

Market Volatility and Economic Policy Uncertainty (EPU) – Upon examining the EPU data closely it was evident that its past values exerted an influence, on the values of EPU signifying a persistent trend of uncertainty over time being present in the analysis results. Furthermore, it was observed that the VIX index displayed a responsiveness to fluctuations, in EPU indicating that heightened levels of policy uncertainty often coincide with increased financial market volatility. The outcomes of response examination, from the VAR model indicate that economic disturbances like a shift in EPU significantly impact GDP growth rate and inflation well as the financial sector performance, over time.

Table 1. Impulse response function



Source: Authors Calculations.

Policy uncertainty, in the economy serves as a gauge of instability by signaling uncertainties tied to government policies and economic decision-making processes on a macro level changes in regulations can have an impact on various economic factors like GDP inflation interest rates unemployment and market volatility. Policymakers' businesses and financial institutions stand to benefit greatly from understanding how these factors react to sudden spikes, in policy uncertainty

By analyzing the Impulse Response Function (IRFs) which are derived from the Vector Autoregression (VAR) we can see how macroeconomic factors respond to a shock, in Economic Policy Uncertainty (EPU). Looking at this data over a span of ten periods gives us an understanding of how uncertainty spreads throughout the economy and impacts variables.

The concept of Economic Policy Uncertainty (EPU) revolves around uncertainty through the unpredictability of government policies, along with regulatory changes and macroeconomic decision making. The effects of policy uncertainty are far reaching. Understanding how these variables respond to shifts in EPU is crucial, for policymakers, businesses and financial institutions navigating the economic landscape. The graph illustrates the correlation, between Economic Policy Uncertainty (EPU) its various elements and their link to Gross Domestic Product (GDP). It features a timeline from January 1995 to December 2022 showing a surge in policy uncertainty, during the Global Financial Crisis (GFC), and The COVID 19 pandemic. These crises have visibly altered the trajectory of EPU over time.

- Impact of an EPU Shock on GDP - Economic theory suggests that higher policy uncertainty reduces business confidence, leading to lower investments and consumption, which in turn negatively affect GDP. When firms and households face uncertainty regarding future policy directions, they often postpone investment and spending decisions, slowing economic

activity. Expected Outcome: An increase in EPU should result in a decline in GDP, as businesses cut back on expansion and consumers reduce discretionary spending.

IRF Result:

If GDP falls immediately after the shock, it indicates that uncertainty significantly reduces economic activity.

If GDP initially rises before declining, it suggests that markets may react with short-term adjustments before experiencing a slowdown.

If the effect dissipates quickly, it implies that uncertainty has only a short-term impact on economic growth, potentially due to effective policy interventions or market adjustments.

- The impact of an EPU shock, on CPI (inflation); The influence of uncertainty, on inflation is intricate since it relies on whether the factor causing uncertainty impacts demand or supply side elements. If uncertainty, in policies results in decreased demand due to investment and spending by consumers it may cause a decrease in inflation as businesses might lower prices to adapt to the demand. On the hand if uncertainty causes disruptions in supply chains or raises production costs (for example through increased risks or changes, in trade policies) inflation could go up. IRI Outcome:

When the Consumer Price Index (CPI) goes down it indicates that people are unsure, about spending money which causes prices to drop. When the Consumer Price Index goes up it means that businesses are facing costs due, to uncertainty and tend to transfer these costs to consumers by raising prices.

- The impact of an EPU shock on European Central Bank interest rates. The way monetary policy reacts to uncertainty is influenced by the banks outlook, on inflation levels economic growth prospects and financial stability measures. During times of instability and the possibility of a downturn, in the economy the European Central Bank (ECB) might decrease interest rates to encourage borrowing and investment activities. Nevertheless, if alongside this uncertainty there are signs of pressures mounting the ECB could opt to increase rates to prevent the economy from overheating. The decrease, in ECB interest rates indicates that policymakers are responding to uncertainty by implementing a monetary policy approach. If the rates stay the same, it suggests that uncertainty alone is not enough to change ECB policy choices.
- The effects of an economic policy uncertainty shock, on joblessness. When there's uncertainty, in policies businesses might hesitate to hire staff which could result in higher unemployment rates since they may postpone hiring until they have a clearer picture of regulatory frameworks and tax policies. Anticipated Result: An increase, in joblessness is foreseen as companies hold off on hiring or reduce positions owing to heightened unpredictability.

After an EPU shock occurs and unemployment increases, because of it indicates that businesses react to uncertainty by scaling back their hiring plans. If unemployment stays constant during this period after the shock takes place it implies that the job market can withstand policy uncertainty well which could be attributed to labor laws or policies that kick in during downturns.

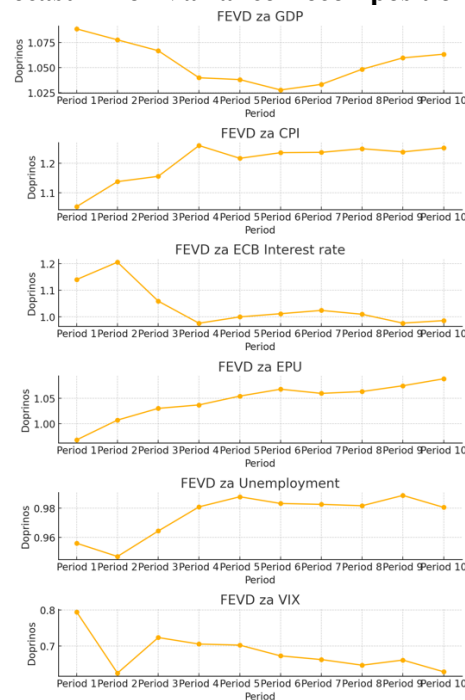
- The financial markets are greatly affected by economic policy uncertainty since investors make changes, to their portfolios based on shifting risk perceptions. Increased uncertainty typically results in stock market volatility and greater fluctuations, in asset prices. Anticipated Result; The VIX is likely to rise due to uncertainty causing instability, in the

market and making investors more risk averse. When the VIX index sharply increases and stays high for a while it shows that financial markets react strongly to uncertainties, in policy. On the hand if the VIX goes up briefly and then levels off it implies that markets can handle uncertainty smoothly without lasting chaos. The impact of an EPU shock on macroeconomic variables underscores the importance of stable and predictable policy environments. Policymakers should aim to reduce uncertainty through clear communication, consistent regulations, and effective monetary interventions to minimize negative economic effects. Understanding how uncertainty propagates through GDP, inflation, interest rates, unemployment, and financial markets provides valuable insights for designing strategies to enhance economic stability in times of uncertainty.

The results of the Augmented Dickey-Fuller test confirmed that the dataset met the stationarity requirement, allowing the direct application of the VAR model. The optimal lag length was determined to be seven, ensuring that the model captured sufficient historical dependencies without introducing excessive complexity. The VAR model estimates revealed significant relationships between unemployment, financial volatility, and economic policy uncertainty, with clear policy implications for stabilizing financial markets and mitigating uncertainty shocks. These findings contribute to a broader understanding of how economic variables interact over time and provide valuable insights for policymakers and financial analysts navigating uncertain economic conditions.

Forecast Error Variance Decomposition (FEVD) – The decomposition of forecast errors revealed that economic policy uncertainty and financial volatility (VIX) were major contributors to fluctuations in macroeconomic variables. This indicates that external shocks, such as geopolitical crises or sudden changes in monetary policy, play a substantial role in shaping economic dynamics.

Table 2. Forecast Error Variance Decomposition (FEVD)

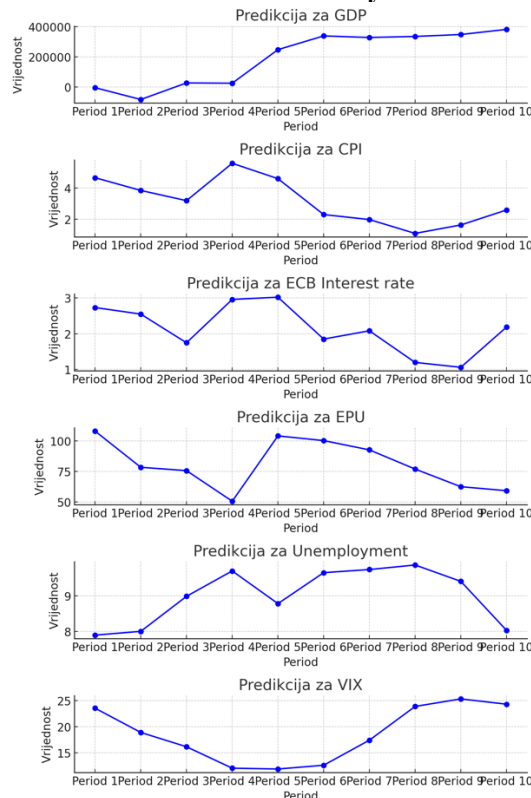


Source: Authors Calculations.

In the VAR model future values can be forecasted by analyzing the relationships, between variables. Once the model parameters are calculated forecasts are made step by step using both data and previously predicted values. The reliability of these forecasts is influenced by how consistent the model's the choice of lag structure, in place.

In this research study's forecasting approach involves predicting indicators such, as GDP growth rates, cost of living adjustments (CPI) interest rates set by the European Central Bank (ECBs) levels of Economic Policy Uncertainty (EPUs) unemployment rates and the Volatility Index (VIX) for the following 10 time periods based on their past correlations.

Table 3. Forecast for 10 years



Source: Authors Calculations.

The predicted data, from the VAR model highlights patterns in the landscape. The **GDP forecast** shows some ups and downs which could mean uncertainty, in the near future. The short term prediction points towards a downturn with hopes for a rebound. This fluctuation is likely due to uncertainties, in policies impacting spending and investment decisions.

Inflation Forecast (Consumer Price Index); The expected inflation trend shows some fluctuations, in forecast periods ahead of us. At glance the Consumer Price Index (CPI) seems to be on the rise which could be due, to pressures caused by supply chain disruptions or uncertainties related to policies. However, as we look further into the periods it seems like the inflation trend is leveling off which might indicate that the economy is adapting to the circumstances.

The ECBs forecast, for interest rates anticipates changes based on the evolving landscape; stable rates may be followed by an upward trend signaling concerns, about potential inflation or financial risks that could prompt a more stringent monetary approach.

The outlook, for Economic Policy Uncertainty (or EPU for short); The prediction shows instability in economic policy uncertainty levels. Consistent. Downs in EPU point to the fact that uncertainty still plays a role in shaping overall macroeconomic outcomes. This uncertainty could arise from shifts, changes in regulations or adjustments, to policies.

Unemployment Rate Forecasted Pathway Prediction; The projected path of the unemployment rate indicates shifts an initial decrease followed by minor ups and downs. The pattern hints at enhancements, in the job market before adapting to economic circumstances. The way unemployment reacts, to events highlights how economic disturbances affect labor markets over time.

Financial Market Volatility (referred to as VIX); The prediction, for VIX shows a rise in market turbulence initially with a decrease, over time which implies that the financial markets could face some short-term instability likely triggered by policies or macroeconomic factors before eventually stabilizing.

Conclusion

The present state of the economy is filled with a sense of unpredictability that greatly influences investment decisions and affects business cycles and monetary strategies while also ensuring stability, in markets is upheld. This study uses the Vector Autoregression (VAR) model to examine data, from European Union economies to understand how uncertainty spreads among aspects. The results of the research confirm that uncertainty impacts indicators such, as GDP growth rates and inflation levels as well as fluctuations in interest rates and unemployment numbers which result in fluctuations, in financial market activities. Furthermore, the research emphasizes how economic policy uncertainty (referred to as EPU) can magnify changes, in conditions significantly by underscoring the nature of consistent and foreseeable policy structures.

This study highlights a finding, various economies react differently to uncertainty shocks based on their characteristics and size. Smaller and open economies are more affected by uncertainty due to their reliance on international trade and foreign investments. Conversely a larger and diversified economy shows strength in dealing with uncertainty rising the significance of structure, in managing its impact. This discovery carries policy implications by highlighting the necessity for actions to aid, at risk economies during times of increased uncertainty.

The research also validates the pattern of uncertainty coming in cycles due to events like crises and geopolitical occurrences such as the 2008 Global Financial Crisis and the Eurozone debt crisis along with recent events like the COVID 19 pandemic and tensions between nations lead to increased levels of uncertainty that impact economic growth in significant ways. During our analysis of response functions (IRFs) we notice that shocks of uncertainty tend to cause declines, in GDP initially and then gradual improvement follows thereafter. The speed and extent of recovery differ in settings due, to differences, in how policies are implemented and the structures of institutions.

One significant discovery, from this study is how economic policy uncertainty affects the effectiveness of monetary policy operations. The findings show that during times of uncertainty the impact of policy is weakened, making it harder for central banks to regulate economic conditions. Specifically, uncertainty can cause delays in investment and spending choices

diminishing the ability of actors to react to shifts, in interest rates. This implies that decision makers should supplement tools with forward guidance and transparent communication approaches to understand uncertainty and improve policy efficiency.

The impact of economics, on influencing unpredictability is an important aspect to consider as well. The research emphasizes how biases in decision making processes. Like following the crowd and reacting excessively to news. Play a role in market instability and economic ups and downs. These behavioral aspects magnify the impact of uncertainty resulting's in heightened instability in markets and economic cycles. Recognizing these elements is essential for creating strategies that bolster strength and change the negative consequences of uncertainty, on investments and job opportunities.

The VAR models predictions offer perspectives on the macroeconomic patterns in the coming ten periods ahead. It indicates a sustained level of uncertainty, in economic policies with potential impacts on GDP growth inflation and financial stability. The forecasted rise in ECB interest rates hints at a possible adjustment in monetary policies due to inflationary influences whereas the outlook for unemployment points towards minor fluctuations indicating a lag in addressing economic disruptions, within job markets. The VIX is set to stay high in the future due, to economic uncertainties causing financial market fluctuations.

The results of this study highlight the significance of institutions and transparent governance, in policy making decisions well as the need for robust risk strategies to be, in place. It is crucial for policymakers to focus on minimizing ambiguity by upholding foreseeable policy structures. Central banks can enhance the credibility of their policies by engaging in communication while governments are encouraged to implement changes that bolster flexibility and adaptability. Moreover, addressing uncertainties is effectively achieved through cooperation and alignment especially considering the interconnected nature of today's financial systems and supply chains.

In the environment of today's world businesses and investors can acquire valuable knowledge from the research study about effectively dealing with uncertainties. It is recommended for companies to adopt tactics such, as diversifying revenue streams and strengthening supply chain resilience while incorporating risk evaluations driven by scenarios. When investors are making choices, it is crucial for them to consider how uncertainty can lead to increased market fluctuations and alterations, in risk profiles.

Although this research has made contributions far there are still many areas left to explore in the future. Given the increasing intricacy of connections, we need advanced models that incorporate real time data sources and utilize machine learning methods to enhance forecasting precision. Furthermore, further studies are crucial to investigate the lasting impacts of uncertainty, within the realms of climate change technological advancements and shifts in demographics. Tackling these challenges will necessitate approaches that draw on insights, from economics, finance, psychology and data science.

Ultimately the presence of uncertainty plays a role, in shaping how economies operate impacting policymaking and financial stability. The results of this research highlight the necessity of taking steps to minimize the effects of uncertainty and capitalize on chances for economic resilience and advancement. Given the challenges in today's economy being able to predict, handle and adapt to macroeconomic uncertainties is key to fostering lasting economic growth and prosperity.

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