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# THE CAUSAL RELATIONSHIP BETWEEN GLOBAL ECONOMIC POLICY UNCERTAINTY (GEPU) AND STOCK MARKETS: EVIDENCE FROM MIKTA COUNTRIES

## ABSTRACT

The purpose of this study is to investigate the causality relationship among the GEPU (Global Economic Political Uncertainty) index and the stock market index of the MIKTA countries. Accordingly, Hatemi-J (2012) asymmetric causality test was applied to investigate the existence of a relationship between the stock markets of the MIKTA countries and the GEPU index. In the study using monthly data, the period between 1999 and 2022, which is the widest data range for all variables, was taken into consideration. First of all, Lee-Strazicich unit root test was used to test the stationarity of the variables and it was observed that the variables were stationary at different levels. Then, the GEPU index is taken as the dependent variable and models are constructed as paired tests for each MIKTA country stock market. (Walmex) for Mexico, (Jakarta45) for Indonesia, (Kospi200) for South Korea, (BIST100) for Türkiye, and (ASX) for Australia are taken as the representative indices of MIKTA country stock markets. The results of the study show that there is a statistically significant causality effect of the GEPU index on stock markets. In general, a negative change in the GEPU index is found to be more dominant on stock markets compared to a positive change. On a country basis, it is found that an increase in the GEPU index causes a decrease in the Mexican, South Korean and Turkish stock markets. In addition, the lack of causality effect in the Australian stock market is interpreted as the fact that this stock market moves more independently from this index.

**Key words:** *Global Economic Policy Uncertainty (GEPU), Stock Market Indices, MIKTA Countries, Hatemi-J (2012) Causality Test*

**JEL:** *C58, D80, G15*

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## 1. INTRODUCTION

Increasing capital flows between countries and decreasing information asymmetries with the development of superior information technologies have accelerated the integration process between capital markets. With market integration, international stock markets have begun to move more synchronously. Higher levels of market integration not only reduced the benefits of international diversification but also triggered the risk of transmission of negative economic shocks (Beine and Candelon, 2011: 299-300). In this context, Lehkonen (2015) described market integration as a double-edged sword and argued that the benefits of this globalization of markets became questionable, especially when these well-integrated markets spread the shocks of the Global Financial Crisis throughout the world. Longin and Solnik (2001) claimed that international stock markets tend to move together strongly under conditions of high market volatility, in other words, market contagion.

The phenomenon of globalization changes the economic development of countries over time with its effect of strengthening the ties between different markets and economies. In this process, the concept of uncertainty has become a new normal that the global economy must face. It has gained a dimension worth investigating in the fields of macroeconomics and finance, especially in terms of economic policy uncertainty, the development of financial markets and even the harmony and stability of societies (Dai, Xiong and Zhou, 2019: 1).

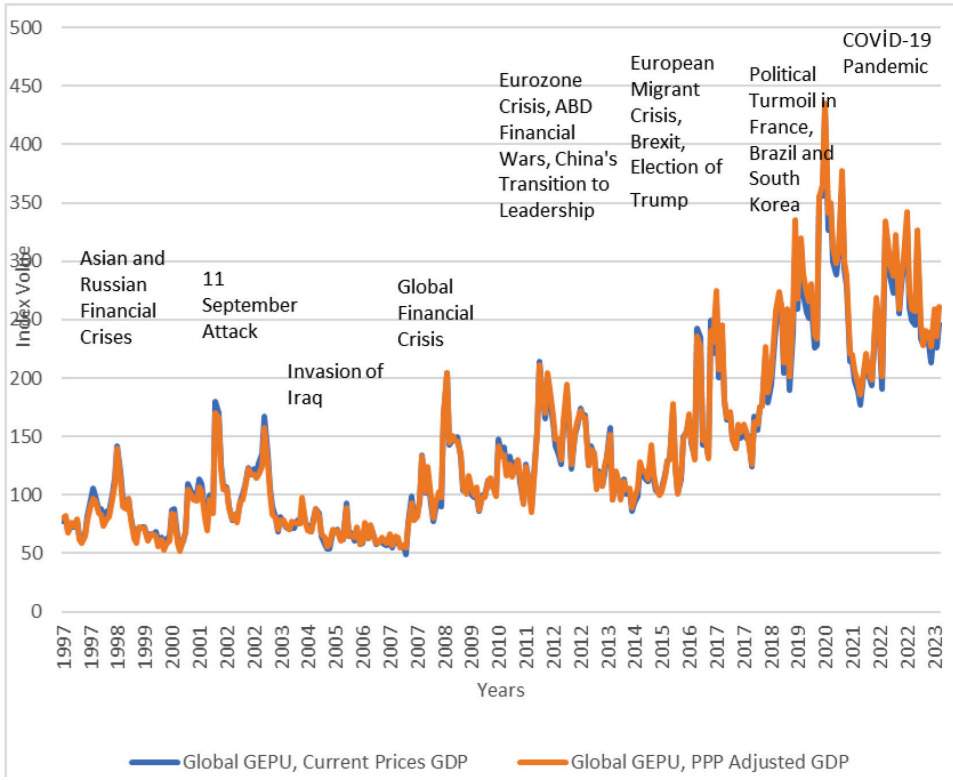
The process of measuring, predicting and managing risk in financial markets is fundamental to the theory and practice of financial economics. Investors and asset managers generally try to maximize return while limiting risk (Bollerslev, Hood, Huss and Pedersen, 2018: 2729-2730). Risk and uncertainty are different concepts. While risk is related to the possibility that the expected return will not be realized, uncertainty is related to the inability to determine the probability distributions of potential future events using scientific and objective approaches. If it is possible to determine the probability distribution of future rates of return using scientific or objective techniques, decision making occurs in a risky environment. Otherwise, decision making takes place in an uncertain environment (Altay, 2015: 42). Bernanke (1983) states that uncertainty delays investments or may be associated with discontinuation of investments, regardless of risk or expected return; It indicates that if the uncertainty disappears, there may be an increase in investments. Following the Global Financial Crisis, the interest of theorists and policy makers focused on uncertainty, and it was stated that uncertainty plays three basic roles in the economy. Firstly, uncertainty may have some negative macroeconomic effects and may also cause a contraction in real activities. Secondly, it is actually based

on the fact that uncertainty is a consequence rather than a cause of entering into economic activity. It is also a theory based on internal uncertainty, which argues that uncertainty tends to be higher during economic recessions. The third is the fact that the relationship among uncertainty and real activity may not be constant over time (Angelini, Bacchiocchi, Caggiano and Fanelli, 2018: 2; Dang, Fang and He, 2019: 1).

In recent years, many indexing methods have been developed using various methodologies regarding the uncertainties that may occur in global markets. The Economic Policy Uncertainty Index (EPU) developed by Baker, Bloom, and Davis (2016) and the Global Economic Policy Uncertainty Index (GEPU) proposed by Davis (2016) are widely used indices to measure economic policy uncertainty. These indices, which calculate economic policy uncertainties with the help of various methodologies, include political discourses as well as financial and economic risks (Gürsoy, 2020: 121; Tokatlıoğlu, 2023: 509).

Baker et al., who introduced the first index with the United States (USA) sample to measure economic policy uncertainty. (2013) developed the EPU index specifically for the USA according to the frequency of publication of some keywords related to economic policy uncertainty in the news of ten major newspapers published in the country. An EPU index above the median value of 100 indicates an increase in uncertainty, while below the median value indicates a decrease in uncertainty. These indexing studies were carried out by Baker et al. (2016) research was furthered in Germany, Australia, the United Kingdom, Brazil, Belgium, China, Denmark, France, South Korea, India, the Netherlands, Hong Kong, Croatia, Ireland, Italy, Sweden, Spain, Japan, Canada, Colombia, It was also created for the countries of Mexico, Pakistan, Russia, Singapore, Chile and Greece. EPU indices contribute to a better analysis of the potential effects of uncertainty by comprehensively addressing the sources of uncertainty. EPU indices determine who will make economic policy decisions and when which economic policy actions will be taken, as well as provide an estimate of uncertainties related to the economic consequences of policy actions and the economic consequences of non-economic political problems. Based on these indexing studies, the GEPU index proposed by Davis (2016) is for 21 countries (USA, Germany, Australia, United Kingdom, Brazil, China, France, South Korea, India, Netherlands, Ireland, Italy, Spain, Sweden, Japan, It is created by averaging the GDP-weighted EPU indices (Canada, Colombia, Mexico, Russia, Chile and Greece). Countries included in the GEPU index represent on average 80% of market exchange rates and approximately 71% of worldwide output on a purchasing power parity-adjusted basis.

**Figure 1.** GEPU Index (January 1997-November 2023)




**Source:** *(https://www.policyuncertainty.com/index.html , 2023).*

Figure 1 shows the historical course of the GEPU index between January 1997 and November 2023. It is seen that the index value increases during periods of political and economic crisis, reflecting the process of uncertainty. In particular, the Asian and Russian Financial Crises in 1997-1998, the September 11 Attacks in 2001, the occupation of Iraq in 2002-2003, the Global Financial Crisis in 2008-2009, the Eurozone crisis in 2011-2012, the US financial wars, the transition to Chinese leadership processes, the European immigration crisis between 2015 and 2017, the Brexit referendum, the election of Donald Trump to the US presidency, and the political turmoil in France, Brazil, South Korea and some countries have created increases in the index value. It is seen that the period in which the index received its highest value was the first months of 2020, which marked the beginning of the COVID-19 pandemic, and in this process, the pandemic became the main element of uncertainty and caused the index to rise to the highest levels.

Theoretically, the effect of economic policy uncertainty on asset prices can be explained through several channels. First, uncertainty can increase market risks by reducing the potential benefit of market measures offered by different government

bodies. This uncertainty can therefore affect important decisions made by companies and other economic actors, including investment, consumption and savings. In addition, policy uncertainty affects both supply and demand channels and has the potential to cause a decrease in investments, an increase in economic contraction, an increase in financing and production expenses, and changes in inflation, interest rates and expected risk premiums (Batabyall and Killins, 2021: 1-2). In particular, changes in inflation, interest rates and expected risk premiums may pose a threat to stock prices by affecting the timing and amount of cash flows of companies. Economic policy uncertainty indices created based on news can have an impact on stock markets as they reflect expectations about the economy and markets. Finally, companies are known to be more motivated to pay cash dividends in periods when economic policy uncertainties decrease, and this has the potential to affect stock prices (Xu, Wang, Chen and Liang, 2021: 13)

Based on this information, this research aims to examine the relationships among the GEPU index and the stock exchange indices of MIKTA (Mexico, Indonesia, South Korea, Türkiye, Australia) countries. MIKTA countries are preferred in the research because of their high economic growth performance, their place in the G-20 group of countries, their geopolitical location and their capacity to play an active role in global economic policy mechanisms thanks to their international diplomatic relations. In addition, the main motivation is that there is no research in the literature examining the relationships amongthe GEPU index and the MIKTA countries' stock exchange index. In the study, the causality in the models was tried to be revealed by using Hatemi-J's (2012) asymmetric causality test.

Following the introduction of the research, empirical research in the literature is summarized. The purpose of the research, the data set and the econometric methods used are detailed, and empirical findings are presented, respectively. The conclusion section was created based on the empirical findings obtained in the application section, and the research was completed by presenting evaluation and policy recommendations.

## 2. LITERATURE

When the literature is examined, it is seen that the number of studies examining the relationship among economic policy uncertainty index and stock market indices has increased in recent years. Most of these studies are based on the global economic policy uncertainty index and analyze the correlation between uncertainty and stock market index values. Studies investigating the correlation among national economic policy uncertainty indices and stock market indices of countries where economic policy uncertainty indices have been developed and disclosed to the public are also included in the literature. However, these studies generally focus on a single country and use time series analysis.

Asgharian et al. (2015) examined how economic policy uncertainty affects commodity prices as well as stock and bond markets, using a mixed sampling approach with quarterly data between 1986 and 2014. Economic policy uncertainty affects both the long-term volatility of stocks and bonds and the long-term correlation between stocks and bonds, according to research based on Chicago commodity and commodity exchange data. Liu and Zang (2015) used S&P 500 index data between 1996 and 2013 and the Heterogeneous Autoregressive Model to examine the effect of economic policy uncertainty on stock market volatility. They find that high economic policy uncertainty significantly increases stock market volatility. Arauri et al. (2016) used the Markov Switching Model in their study to examine the effect of economic policy uncertainty on the US stock market between 1900 and 2014. The data reveals that stock returns fall significantly when policy uncertainty increases. However, the connection between the two variables is not linear. In cases of severe volatility, economic policy uncertainty has a larger and longer-lasting impact on market returns. Using monthly data between 1997 and 2018 with the help of ARCH-GARCH models, Korkmaz and Güngör (2018) investigated whether global economic policy uncertainty caused volatility in the returns of Borsa Istanbul's Selected Indices. According to the test results, policy uncertainty has a positive and significant effect on the volatility and returns of the selected stock market. Sadeghzadeh and Aksu (2020) examined the non-reciprocal link between economic uncertainty and the BIST 100 index using monthly data between 1998 and 2018. They used the ARDL Bounds Test methodology for their analysis. The findings show that higher levels of uncertainty lead to greater outflows from the stock market, but reductions in global uncertainty positively impact the stock market. In his study, Gemici (2020) conducted a panel causality test using monthly data from 1997 to 2019 to analyze the link among economic uncertainty and stock market index in G7 countries. The findings revealed that uncertainty has a long-term detrimental effect on the stock market index. The study also revealed that there is a reciprocal relationship among these two factors. Gürsoy and Zeren (2022) conducted panel causality tests for G-7 and BRIC countries using monthly data in the 2015-2020 period to examine the link among economic uncertainty and stock market index. Their findings indicate a bidirectional causality relationship from the economic policy uncertainty index to stock markets in Germany, while a unidirectional causality relationship was observed in the USA and Brazil. Another finding from the research indicates that there is a more significant correlation among the policy uncertainty index and stock markets in industrialized countries compared to developing countries. Saka Ilgın (2022) conducted a study examining the effect of policy uncertainty on stock markets. Monthly data from 2002 to 2021 was used in the study and panel causality test was applied to evaluate the connection between two variables. The study focused on five European countries at the national

level. The results show a strong inverse correlation among policy uncertainty and five major European stock market indices. Kum et al. (2023) examined the impact of the Global Economic Policy Uncertainty Index, BIST100 Index and foreign direct investments in banks on Türkiye's CDS risk premium between 2008 and 2022. They used the ARDL approach in their analysis. The results show a strong and statistically significant correlation among the Global Economic Policy Uncertainty Index and the CDS. However, no significant relationship was found between foreign direct investments in banks and CDS. Additionally, there is a significant negative correlation between the BIST100 index and CDS.

There is a significant amount of research in the existing literature examining the relationship between the global economic uncertainty index, national economic uncertainty index and other macroeconomic factors.

Using structural VAR models, Colombo (2013) examined the consequences of a shock in US economic policy uncertainty on various Eurozone macroeconomic aggregates for the period 1998-2009. The findings show that a one standard deviation shock in US economic policy uncertainty leads to a statistically significant decline in European industrial production and prices of -0.12% and -0.06%, respectively. Using a VAR model, Swallow and Cespedes (2013) examined the effect of uncertainty shocks in developing economies using monthly data in the 1990-2021 period. It has been determined that developing economies experience much more severe declines in investment and private consumption following an exogenous uncertainty shock, taking significantly longer to recover, and experiencing a subsequent overshoot in activity. Results have been obtained showing that investment and consumption patterns are linked to the depth of financial markets. It has therefore been argued that Uncertainty shocks in emerging economies where financial markets are less established can explain only half of the investment loss in countries. Kang et al. Using monthly data from 1985 to 2010, (2014) examined the effect of economic policy uncertainty and its components on firm-level investments in the United States using a GARCH model. The results show that the presence of economic policy uncertainty, combined with firm-level uncertainty, leads to a decrease in investment preferences. Another important finding is that economic policy uncertainty has little effect on the investment decisions of 20% of large publicly traded companies. Wang et al. (2014) used quarterly data between 2003 and 2012 with the regression analysis method to investigate the effect of economic policy uncertainty on Chinese company investments. Test results reveal that businesses with high profitability, those using internal financing mechanisms, and privately owned companies are exposed to less impact from economic policy uncertainty. Additionally, firms that focus on foreign markets and have a high degree of

market orientation are more sensitive to fluctuations in economic policy. Bordo et al. (2016) argue, based on data of the US economy between 1900 and 1984, that economic policy uncertainty has a significant negative effect on the expansion of bank credit. Additionally, the findings are consistent with previous research finding that economic policy uncertainty inhibits credit expansion through bank lending and delays the U.S. economy's recovery from the great recession. In his study, Akkuş (2017) used the Dynamic Panel GMM approach to evaluate the impact of the US EPU Index on the growth rates of developing countries. According to the results of the research, which includes data obtained from 33 developing countries between 1994 and 2013, political instability in developing countries, except for the US EPU, has a significant and negative impact on the growth rate of the countries. Demir et al. (2018) evaluated the effect of economic policy uncertainty on Bitcoin returns using the Bayesian Graphical Structural VAR approach with a daily data set between 2010 and 2017. The results reveal that there is a negative connection among economic policy uncertainty and Bitcoin returns. Şahinöz and Erdoğan Coşar (2018) used data between 1998 and 2014 to create an economic-political uncertainty index for the Turkish economy and then used the VAR technique to evaluate the impact of the index on macroeconomic variables such as investment, consumption and growth. The findings reveal that the EPU index negatively affects investment, consumption and growth variables. Ashraf and Shen (2019) conducted a research examining the impact of economic policy uncertainty on interest rates and gross bank loans in 17 countries during the period 1998-2012. The findings of the regression analysis show that economic policy uncertainty has an effect on the interest rates of gross bank loans.

Akdağ (2020) conducted a study examining the effect of economic policy uncertainties on producer and consumer confidence indices in a total of 16 countries, 13 of which are OECD members. The study used a panel causality approach and found that policy uncertainties are the primary factor affecting confidence indices. Güney's (2020) study investigated whether economic policy uncertainty caused fluctuations in Dollar/Turkish lira and Euro/ Turkish lira exchange rates. Boundary test technique was used for analysis in the study. According to the findings of the research using a monthly data set from 1999 to 2018, it can be concluded that the policy uncertainty of the USA led to an increase in the Dollar / Turkish lira exchange rate. However, Europe's policy uncertainty does not have any impact on the Euro/ Turkish lira exchange rate.

Iyke (2020) conducted a study to examine the effect of the Covid-19 pandemic on political uncertainty in five leading Asian countries. In the study, a policy uncertainty index was developed for the period 1987-2020 by using various time periods for

each country. Regression forecast findings show that the Covid-19 pandemic has a significant and positive effect on the EPU index in China and Korea. In contrast, the pandemic has not affected policy uncertainty in India, Japan and Singapore; however, the index score remained consistently high in these countries. Demir and Advisor (2021) conducted a comprehensive analysis investigating the effect of geopolitical risks and economic uncertainty on bank loans. In their study, they used a data set consisting of 2439 banks from 19 different countries and covering the period 2010-2019. In the study using the dynamic panel data technique, it was determined that economic uncertainty led to a significant contraction in total bank loans, especially when it came to corporate loans. Furthermore, geopolitical concerns have a reducing effect on both housing and consumer loans. Kanat (2021) conducted a research to examine the effect of the economic policy uncertainty index on four leading cryptocurrencies (Bitcoin, Ethereum, BinanceCoin, Ripple). Monthly data from January 2018 to December 2020 was used in the study and panel causality test was applied. While the study reveals that there is bidirectional causality between the EPU index and Bitcoin, no causal relationship has been discovered with Ripple. The policy uncertainty variable has been shown to have a unidirectional causal relationship with other cryptocurrencies. In his study, Küçüksakarya (2021) examined the relationship between local and international EPU and net portfolio investments. Using the Panel ARDL technique, they evaluated data covering the years 2005-2019 from 23 countries. The research reveals that current price-based global economic policy uncertainty negatively affects long-term portfolio investments. Additionally, economic policy uncertainty specific to individual countries and worldwide economic policy uncertainty based on current prices both have a positive impact on short-term portfolio investments. In contrast, global policy uncertainty based on purchasing power parity has a negative impact. Conversely, there are differences in short-term outcomes between countries that attract portfolio investments and those that do not, depending on economic policy uncertainty. Gürsoy (2021) investigated the relationship between policy uncertainty and tourism revenues with monthly data between 1997-2020. The study used Hatemi-J (2012) asymmetric causality tests to evaluate the Turkish economy. The results of the research show that there is a direct relationship among policy uncertainty in Russia and Germany and Türkiye ‘s tourism revenues. However, it has been determined that there is no causality between policy uncertainty and tourism revenue in the UK.

In his study, Yıldırım (2021) investigated the impact of uncertainty on economic growth using the ARDL model and monthly data covering the years 1998-2019 in Türkiye. It has been determined that the short-term negative impact of uncertainty on economic growth has weakened with the development of the

financial sector. Additionally, long-term economic growth is not affected by uncertainty. Hayali (2021) investigated the relationship among foreign direct investment and uncertainty in the Turkish economy between 1980-2020 using Granger Causality Analysis. Based on the data, it has been revealed that there is a unidirectional causality from foreign direct investment to the uncertainty index in Türkiye. Doğan (2021) examined the relationship among policy uncertainty and price stability in the Turkish economy among 2003 and 2021 using quarterly data and ARDL and FMOLS models. The findings of the study show that political uncertainty affects inflation statistically significantly and negatively. William and Fengrong (2022) conducted a causal analysis to research the relationship among economic policy uncertainty and innovation. Data covering the years 1976-2017 from 17 countries were used in the study. The findings show that the existence of economic policy uncertainty constitutes an obstacle to the innovation process. In liberalized financial markets with high levels of transparency and strong protection of property and patent rights, the negative impacts of economic policy uncertainty on innovation are somewhat less severe.

Gülcan (2022) analyzed the effect of global economic policy uncertainty on crude oil prices using data for the period January 1997-April 2022 and Breitung and Candelon (2006) frequency causality test. According to the findings, it has been determined that there is a long-term causality relationship from GEPU to crude oil spot and futures prices and from crude oil future prices to GEPU, but there is no causality relationship from crude oil spot prices to GEPU. Quamruzzaman et al. (2022) examined the impact of economic policy uncertainty on renewable energy consumption, government debt and foreign direct investment in 13 major oil importing countries. They used data between 1995 and 2018 and used panel ARDL to detect symmetric effects, NARDL to detect asymmetric effects, and causality tests to determine directional relationships. Panel ARDL estimation findings show that economic policy uncertainty affects renewable energy consumption in a statistically significant and negative way, while it has a positive effect on foreign direct investment and government debt. In addition, asymmetric test findings indicate that positive and negative shocks occurring in economic policy uncertainty have a statistically significant and negative effect on renewable energy use. In a study by Yaman (2022), the impact of economic policy uncertainty on imports was examined in 18 countries. Panel data was used in the research and covered the period 1997-2019. The findings revealed a consistent negative impact on imports across all countries.

Nuguyen (2022) examined the risk and length of economic policy uncertainty contributing to economic stagnation in 10 key European Union countries in the 1987:2-2021:1 quarter. Test findings show that economic policy uncertainty not

only increases the likelihood of an economic recession but also prolongs the duration of the recession. Usta and Mete (2022) investigated the impact of GEPU on consumption expenditures, domestic savings, fixed capital formation and economic growth in 11 European Union member countries in the 2006-2020 period with the Dumitrescu-Hurlin causality analysis method. While it was determined that GEPU was the cause of domestic savings, fixed capital formation and economic growth, causality between GEPU and consumption expenditures could not be determined. Kilic et al. (2023) examined the correlation between Bitcoin prices and economic policy uncertainty index (EPU), broad money supply (M3) and inflation. The study used ARDL bounds test and Toda Yamamoto causality tests, focusing on BRIC countries using monthly data from August 2010 to December 2021. Empirical study reveals that China's EPU index has a detrimental effect on Bitcoin in both the long and short term. In the case of India, the EPU index has been found to have a negative effect on Bitcoin price in the long term, but has no significant impact in the near term. The EMU index does not affect Bitcoin in Russia and Brazil.

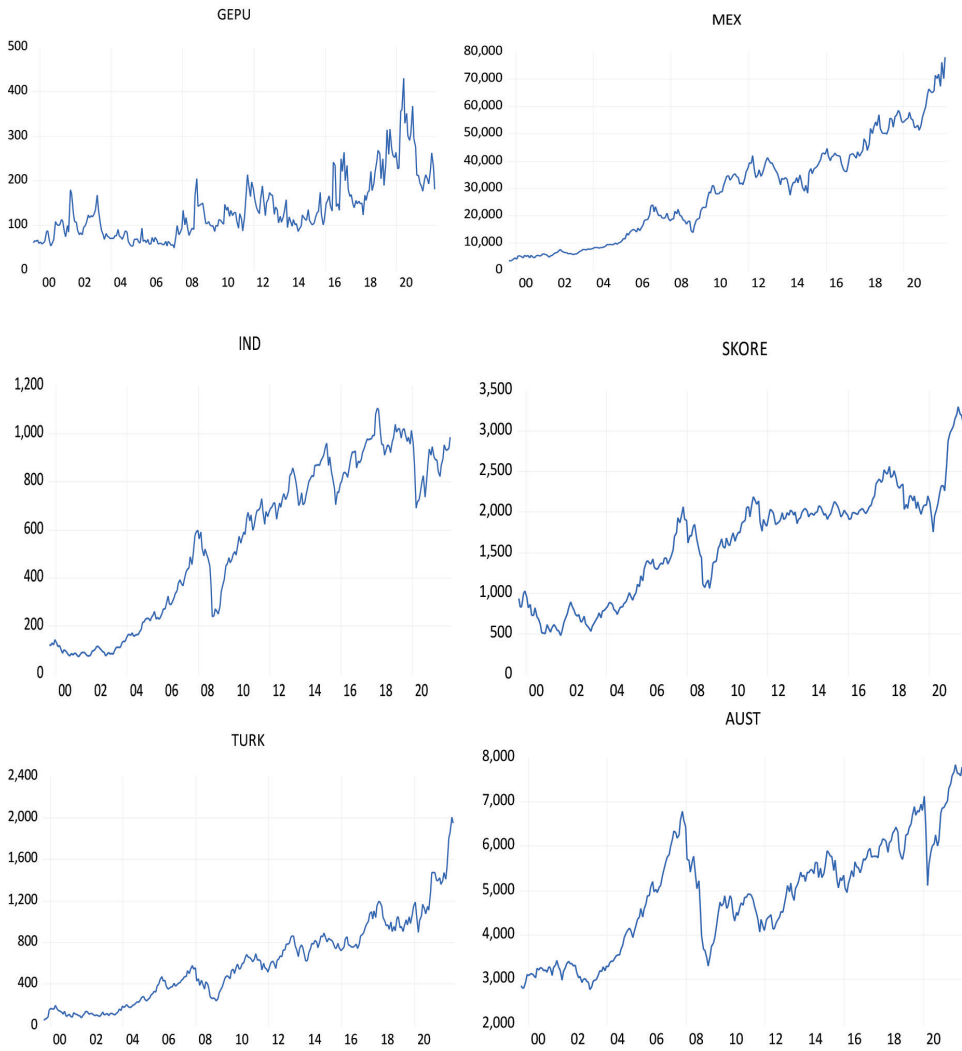
When existing studies on the subject are evaluated, it is thought that this study will make a valuable contribution to the literature. This research is the first to investigate the relationship among the global economic policy uncertainty index and the benchmark stock market indices of MIKTA countries using the Hatemi-J (2012) method.

## 3. METHODOLOGHY

### 3.1. DATA AND METHOD

This research investigates the relationship among economic and political uncertainties in global markets and country stock market pricing. In this context, Hatemi-J (2012) asymmetric causality test was used to investigate the existence of a relationship between the stock markets of MIKTA countries and the GEPU index. In the study where monthly data was used, the period between 1999 and 2022, which is the widest data range for all variables, was taken into account. Data for the GEPU variable was obtained from www.policyuncertainty.com, while data on country stock markets was obtained from investing.com. The application part consists of symmetric and asymmetric causality equations in which the Global Economic Uncertainty Index (GEPU) is taken as the dependent variable in the model and the stock market index of each other country is taken as the independent variable. In addition, before the causality test was performed, the Lee-Strazicich (2003) unit root test, which includes structural breaks, was used to test the stationarity of the series and was presented with the break dates.

**Figure 1.** Price Series Graphs of Variables




**Source**: Created with the EViews 19 program.

## 3.2. HYPOTHESES

The main hypothesis of the research is as follows.

**$H_0$:** *There is no causality relationship among GEPU and MEX, IND, SKORE, TURK, AUST.*

**$H_1$:** *A causal relationship was found between GEPU and MEX, IND, SKORE, TURK, AUST.*

### 3.3. LEE-STRAZICICH UNIT ROOT TEST

Another unit root test in which structural breaks are determined by internal factors is the two-break unit root test developed by Lee and Strazicich (2003). This unit root test was derived by starting from and expanding the LM unit root test introduced to the literature by Schmidt and Phillips (1992). Additionally, this test evaluates both the null hypothesis and the alternative hypothesis, taking into account the break (Lee and Strazicich, 2003).

$$y_t = \delta' Z_t + e_t \qquad ve \qquad e_t = \beta e_{t-1} + \epsilon_t \tag{1}$$

The vector $Z_t$ represented by Equation (1) refers to exogenous variables. On the other hand, $\epsilon_t \sim$iid N $(0, \sigma^2)$ represents the error terms. Test regression is shown in Equation (2).

$$\Delta_t = \delta' \Delta Z_t + \phi S_{t-1} + u_t \tag{2}$$

Structural breaks can be discovered by analyzing the exogenous variables $Z_t$ in Equation (2). If two breaks occur in both the trend and the level, $Z_t = (1, t, D_{1t}, D_{2t}, DT_{1t}, DT_{2t})$. Equation (2) in the LS (2003) unit root test can be used to determine the presence or absence of a unit root in the series. The null hypothesis ($H_0$: $\phi = 0$) suggests that the series exhibits unit root behavior in the presence of a structural break, and the alternative hypothesis ($H_1$: $\phi < 0$) suggests that the series is stationary in the presence of a structural break.

### 3.4. HATEMI-J (2012) ASYMMETRIC CAUSALITY ANALYSIS

In causality analyzes in which an asymmetric relationship is tested, series that are thought to have no relationship at first glance; It is argued that a hidden relationship can be realized by including the asymmetry among them, and that the hidden relationship will only emerge by taking into account the asymmetry between the components. The asymmetric causality test, which was first introduced to the literature by Granger and Yoon (2002), was developed by Hatemi-J (2012) and causality is investigated by separating the variables into positive and negative components (Polat et al., 2021: 82). In this regard, the equations established for finding the hidden relationship of the variables are given below, and it can be seen that they are arranged in a way that will serve to reveal both positive and negative relationships.

If the causality relationship between $y_{1t}$ and $y_{2t}$, which are two integrated cases, is analyzed below (Hatemi-J, 2012: 449-450):

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{10} + \sum_{i=1}^{t} \varepsilon_{1i} \qquad ve \qquad y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{20} + \sum_{i=1}^{t} \varepsilon_{2i} \tag{3}$$

In the equation, t=1,2,…T represents the constant term, $y_{1t}$ and $y_{2t}$ refer to the initial values, and $\varepsilon_{1i}$ and $\varepsilon_{2i}$ refer to the error terms. The equation for positive-negative shocks is shown as in Equation (7);

$$\varepsilon_{1i}^{+} = (\varepsilon_{1i}, 0), \varepsilon_{2i}^{+} = (\varepsilon_{2i}, 0), \varepsilon_{1i}^{-} = (\varepsilon_{1i}, 0) \; ve \; \varepsilon_{2i}^{-} = (\varepsilon_{2i}, 0) \tag{4}$$

where $\varepsilon_{1i} = \varepsilon_{1i}^{+} + \varepsilon_{1i}^{-}$ and $\varepsilon_{2i} = \varepsilon_{2i}^{+} + \varepsilon_{2i}^{-}$.

Accordingly, Equations (5) and (6) were arranged and reconstructed as follows;

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1i}^{+} + \sum_{i=1}^{t} \varepsilon_{1i}^{-} \tag{5}$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2i}^{+} + \sum_{i=1}^{t} \varepsilon_{2i}^{-} \tag{6}$$

In the last stage, the expression of positive-negative shocks in variables in cumulative form is as follows;

$$y_{1t}^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+}, \quad y_{1t}^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-}, \quad y_{2t}^{+} = \sum_{i=1}^{t} \varepsilon_{2i}^{+}, \quad y_{2t}^{-} = \sum_{i=1}^{t} \varepsilon_{2i}^{-}, \tag{7}$$

In addition, the equality $y_t^{+} = y_{1t}^{+}, y_{2t}^{+}$ is accepted and the causality relationship between the positive components is tested with the help of the p-lagged vector autoregressive model (VAR). The VAR (p) model is shown as in Equations (8);

$$y_t^{+} = v + A_1 y_{t-1}^{+} + \cdots + A_p y_{t-1}^{+} + u_t^{+} \tag{8}$$

In the equation, $y_t^{+}$ is expressed as the vector of the variable in 2x1 dimension, $v$ is the vector of the constant variable in 2x1 dimension, $u_t^{+}$ is expressed as error terms in 2x1 dimension, and $A_r$ is expressed as the matrix of parameters created by using information criteria for the lagged length in 2x2 dimension of "$r$" order.

## 4. FINDINGS

### 4.1. FINDINGS OF LEE-STRAZICICH UNIT ROOT TEST

First, the stationarity levels of the series will be determined. Considering the presence of structural breaks in the series, the broken unit root test recommended by Lee-Strazicich (2003) was performed. Table 1 shows the results of the unit root test for the GEPU, MEX, IND, SKORE, TURK and AUST series, respectively.

**Table 1.** Findings of Lee-Strazicich Unit Root Test

| Lee Strazicich (C Model) | | | | | | |
|---|---|---|---|---|---|---|
| **Variable** | **I(0)** | **Break Date** | **Critical Value** | **First Difference** | **Break Date After First Difference** | **Critical Value** |
| | **(T) Statistics** | | | **(T) Statistics** | | |
| **GEPU** | -4.231429 | December 2017 | -3.951608 | -11.61825* | December 2017 | -3.950959 |
| **MEX** | -4.217870 | February 2013 | -4.074245 | -8.510134* | December 2014 | -4.047537 |
| **IND** | -4.554766* | January 2018 | -3.951088 | - | - | - |
| **SKORE** | -4.995310* | November 2005 | -4.995310 | - | - | - |
| **TURK** | -5.365244* | November 2019 | -3.957047 | - | - | - |
| **AUST** | -4.145467* | July 2008 | -4.057991 | - | - | - |

Looking at the unit root results obtained from Table 1, it was determined that the IND, SKORE, TURK and AUST index series became stationary at level I(0), while the GEPU and MEX index series became stationary after taking a difference from I(1). In addition, there is no unusual situation in these break dates, and it is thought that the movements in political and economic policies caused the breaks.

## 4.2. HATEMI-J (2012) FINDINGS OF ASYMMETRIC CAUSALITY TEST

In this section, the causality link between the GEPU index and MEX, IND, SKORE, TURK, AUST indices was tested by dividing them into positive and negative shocks and considering them separately. The test results achieved are shown in Table 2.

**Table 2.** Findings of Hatemi-J (2012) Asymmetric Causality Test

| **Direction of Causality** | **Wald Statistics Value** | **Bootstrap Critical Values** | | |
|---|---|---|---|---|
| | | **%1** | **%5** | **%10** |
| GEPU(+) > MEX (+) | 25.614* | 13.997 | 9.902 | 7.957 |
| GEPU(-) > MEX (-) | 25.177* | 14.955 | 9.999 | 7.982 |
| GEPU(+) > IND (+) | 14.908* | 13.235 | 8.310 | 6.567 |
| GEPU(-) > IND (-) | 14.780* | 12.431 | 8.279 | 6.443 |
| GEPU(+) > SKORE (+) | 8.163 | 14.238 | 8.824 | 6.759 |
| GEPU(-) > SKORE (-) | 8.645* | 12.793 | 8.495 | 6.437 |
| GEPU(+) > TURK (+) | 8.417 | 13.749 | 8.516 | 6.494 |
| GEPU(-) > TURK (-) | 9.696* | 14.475 | 8.819 | 6.580 |
| GEPU(+) > AUST (+) | 4.176 | 12.230 | 7.906 | 6.433 |
| GEPU(-) > AUST (-) | 4.896 | 12.301 | 8.060 | 6.344 |

**NOTE:** *: *It is significant at the 5% level.*

According to the table containing the Hatemi-J Asymmetric causality test results, it was found statistically significant at the 5% significance level that there was both a positive and negative causality relationship from the GEPU index to the stock markets. In the overall study, it was seen that the index with the strongest causality impact from the GEPU index was MEX, and these results were obtained from the results that the Wald statistical value in the positive direction (25.614) and in the negative direction (25.177) were greater than the bootstrap values (9.902) and (9.999), respectively. For this equation, the $H_0$ hypothesis was rejected, but the $H_1$ hypothesis could not be rejected. At the same time, for the overall study, findings were found that AUST was the index that was neither positively nor negatively affected by the GEPU index. This result shows that the Wald statistical value is lower than the bootstrap values of (7.906) and (8.060) in the positive direction (4.176) and in the negative direction (4.896), respectively. In the analysis results, the partially affected indices were IND, SKORE and TURK indices. While it was seen that a positive change in the GEPU index had a statistically significant interaction on the IND index at the 5% significance level, the Wald statistical value for a negative change was smaller than the bootstrap value. On the other hand, it was observed that there was only a negative causality effect in the model established for the GEPU index, SCORE index and TURK. In the model in which a negative causality established between the GEPU index and the SCORE index was tested, the Wald statistical value was (8.645) and was higher than the bootstrap values (8.495). The equation provides findings that there is a causality relationship at a statistical significance level of 5%. For this equation, the $H_0$ hypothesis was rejected, but the $H_1$ hypothesis could not be rejected. In addition, in the model in which the positive relationship was tested, it was determined that it was not significant since the bootstrap value was greater than the Wald statistic value. Finally, a negative causality was detected for the model established between the GEPU index and the TURK index, and the Wald statistic value in the model was (9.696) and was higher than the bootstrap values (8.819). In this case, the $H_0$ hypothesis was rejected, but the $H_1$ hypothesis could not be rejected. The same relationship gave different results in the equation where the positive relationship was tested, and the Wald statistic value in the model was (8.417) and was lower than the bootstrap values (8.516). In this case, the $H_1$ hypothesis was rejected, but the $H_0$ hypothesis could not be rejected.

## CONCLUSION

As information asymmetries gradually decrease in financial markets, predicting stock price movements by market actors becomes more difficult and requires a more detailed research and monitoring process. Risk and uncertainty elements encountered in country economies and financial markets can especially affect the investment, consumption, financing and savings decisions of economic units and market actors. The concept of uncertainty, unlike the measurable risk factor

that can be evaluated by scientific and objective means, poses a problem for market participants in predicting the implementation, consequences and timing of economic policies. The impacts of economic policy uncertainty, especially on stock market indices, have continued to be scrutinized by various factors in the recent past.

Markets are influenced by the complex nature of monetary and fiscal policy as well as insightful financial market advice provided by government bodies. Through these forward-looking guidance, expectations are determined and market actors take positions and make plans for the future. Uncertainty, which makes planning for the future difficult, can trigger an impasse in the direction and implementation of economic policies, affecting the funds that will flow to asset markets, the risk tolerance of investors and therefore asset prices. In this context, the research aimed to examine the interactions among the GEPU index and the stock exchange indices of MIKTA countries using the Hatemi-J (2012) causality test.

This research, based on research in the national and international literature on EPU and GEPU index, includes empirical results revealing the effects of the GEPU index on MIKTA country stock exchange indices. In line with the research results, there is a causality relationship from the cumulative positive and negative shocks of the GEPU index to the positive and negative shocks of the Mexican stock market, respectively, at the 5% significance level. In the same direction, from the cumulative positive shocks of the GEPU index to the positive shocks of the Indonesian stock market; Causality has been determined from the cumulative negative shocks of the GEPU index to the cumulative negative shocks of the South Korean and Turkish stock markets. Throughout the research, the index with the strongest causality effect from the GEPU index was the Mexican stock market; It has been observed that the Australian stock market is an index that is neither positively nor negatively affected. Additionally, Indonesia, South Korea and Türkiye stock markets were partially affected by the GEPU index. The results of the study are somewhat consistent with the existing literature. The results of this research are reported in the literature by Asgharian et al. (2015), Liu and Zang (2015), Arauri et al. (2016), Korkmaz and Güngör (2018), Sadeghzadeh and Aksu (2020), Gemici (2020), Gürsoy and Zeren (2022), Saka Ilgın (2022) and Kum et al. (2023) is similar to their research.

The findings of this research reveal that economic policy uncertainty, particularly the GEPU index, has significant effects on the stock market indices of the MIKTA countries. Investors can minimize their risks by considering these uncertainties and implementing strategies such as portfolio diversification, risk hedging, and adopting short-term strategies instead of long-term investments. Governments and central banks can build market confidence and strengthen economic stability by adopting more transparent, predictable, and consistent policies to reduce economic uncertainty. Furthermore, to ensure that market participants are well-informed,

educational programs can be organized, enabling investors to be better prepared for potential economic fluctuations. Since Australia's stock market index is not affected by the GEPU index, other countries can benefit from Australia's strategies and develop policies that promote market independence. This can help ensure that markets operate in a more stable and sustainable manner, especially during periods of high economic uncertainty. Additionally, other MIKTA countries may find it beneficial to adopt Australia's approaches to market regulation and stability to manage economic uncertainties more effectively. In conclusion, this research provides an important source for understanding the effects of economic uncertainties on financial markets and developing more effective strategies in this regard. Investors, governments, and market regulators can make more informed and sound decisions by considering these findings, which can enhance economic stability and improve market performance. Steps taken to reduce the effects of economic uncertainty will positively affect not only stock market performance but also overall economic growth and sustainable development. In this context, cooperation and strategic planning at both national and international levels are of great importance.

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# UZROČNA VEZA IZMEĐU NEIZVJESNOSTI GLOBALNE EKONOMSKE POLITIKE (GEPU) I TRŽIŠTA DIONICA: EVIDENCIJA IZ MIKTA ZEMALJA

## SAŽETAK

Svrha ove studije je da istraži uzročnu vezu između GEPU (Globalna ekonomska politička neizvjesnost) indeksa i indeksa berzi zemalja MIKTA. Shodno tome, Hatemi-J (2012) test asimetrične uzročnosti primjenjen je da se ispita postojanje veze između tržišta dionica zemalja MIKTA i GEPU indeksa. U istraživanju korištenjem mjesečnih podataka uzet je u obzir period između 1999., i 2022. godine, što je najširi raspon podataka za sve varijable. Prije svega, Lee-Strazicich test jediničnog korjena je korišten za testiranje stacioniranosti varijabli i uočeno je da su varijable stacionirane na različitim nivoima. Zatim se GEPU indeks uzima kao zavisna varijabla i modeli se konstruišu kao uporeni testovi za svaku berzu MIKTA zemlje. (Walmex) za Meksiko, (Jakarta45) za Indoneziju, (Kospi200) za Južnu Koreju, (BIST100) za Tursku, i (ASX) za Australiju uzimaju se kao reprezentativni indeksi tržišta dionica MIKTA zemalja. Rezultati studije pokazuju da postoji statistički značajan efekat uzročnosti GEPU indeksa na berzama. Generalno, negativna promjena GEPU indeksa je dominantnija na berzama u odnosu na pozitivnu promjenu. Na nivou zemlje, utvrđeno je da povećanje GEPU indeksa uzrokuje smanjenje na meksičkim, južnokorejskim i turskim berzama. Pored toga, nedostatak efekta uzročnosti na australijskom tržištu dionica se tumači kao činjenica da se ovo tržište dionica kreće nezavisno od ovog indeksa.

**Ključne riječi:** *neizvjesnost globalne ekonomske politike (GEPU), berzanski indeksi, zemlje MIKTA, Hatemi-J (2012) test uzročnosti*

**JEL:** *C58, D80, G15*