DO GLOBAL UNCERTAINTY AND RISK INFLUENCE ECONOMIC GROWTH IN NIGERIA? EVIDENCE FROM QUANTILE REGRESSION ANALYSIS

MIBA'AM, WALWAI BENJAMIN
Economics Department, Plateau State University Bokkos, Plateau State
mibaam@plasu.edu.ng; 07038516301

ABSTRACT
Uncertainties and risks have continued to play a significant role in shaping economic decisions and outcomes in many countries. Like many other countries, Nigeria is exposed to global economic policy uncertainty. Nigeria is vulnerable to geopolitical risk because of its strategic location in both sub-Saharan Africa and the West African subregion. However, the impact of economic policy uncertainty and geopolitical risk on Nigeria's economic growth has not received much research. Considering these circumstances, the study utilizes quantile regression analysis to explore the impact of global economic policy uncertainty and geopolitical risk on Nigeria's economic growth, utilizing monthly data for all variables from January 1997 to December 2023. The result indicates that economic growth is negatively related to global economic policy uncertainty at the lower quantile; however, the relationship turned positive at the middle and upper quantile. On the other hand, geopolitical risk has a negative relationship with economic growth across all the quantiles. The study recommends that policymakers make robust policies that will promote the diversification of the Nigerian economy to withstand any form of influence emanating from elsewhere. Similarly, human capital development should continue to be promoted with a view of having quality manpower capable of initiating local solutions to Nigeria's problems, among other recommendations.

Keywords: Economic Policy Uncertainty, Geopolitical Risk, Economic Growth, Quantile Regression.
JEL classification codes: E65, F01, F61, F62, O11.

1 INTRODUCTION
As globalization and economic integration continue to flourish among the world's countries, so too have business relationships, international business transactions, and trade taken on dynamic positions (Udeaja et al. 2024). For survival and meeting citizens' needs, countries have remained interdependent. It is very common nowadays to see countries not on favorable terms with one another in terms of diplomacy but experiencing constant or even increased trade relationships. International business is even more complicated now that trade and relationships are changing. This implies that policymakers, international monetary organizations, researchers, and scholars must examine trade and interactions between countries from various perspectives (Adedoyin et al., 2020; Ozili, 2022).

As globalization has grown, so have uncertainties and risks (Anser et al., 2021; Wang & Sibt-E-Ali, 2024; Miba'am & Güngör, 2025; Monday & Osaretin, 2024); tensions in one country or region can have a big effect on another country or region that has little to do with the source of the tension (Salisu et al., 2024; Monday & Osaretin, 2024). Misunderstandings such as poorly thought-out economic policies in one region can be transferred to other regions or countries through trade, economic integration, or alliances (Uche et al., 2022; Ozili, 2022; Wang & Sibt-E-Ali, 2024; Sokunbi et al., 2024). An example that fits succinctly to this point is the global financial crisis that started in the US but spread to other countries across the globe, leaving many economies in distress, such that bailouts had to be rolled out to save many economies that were thought to be virile and self-sustaining. The US-China trade war has also affected the

global economy and many regions. The US's and China's trade embargoes have reduced trade between the two powerful producers but increased trade with other nations. Such alignments and realignments have come with varied economic impacts. The ongoing Ukraine-Russia war has also proven to have a significant effect on the global economy, as it has led to instability in global oil prices. Other well-known occurrences that reverberate into the global platform include the Brexit crisis, the US-North Korea nuclear deal tension, the US-Iran economic sanctions and nuclear threats, the Israel-Palestine war, the outbreak of the coronavirus disease in 2019 (COVID-19), etc. (Udeaja et al., 2024; Adedoyin et al., 2020; Uche et al., 2022; Ekeocha et al., 2023; Miba'am & Güngör, 2025). Policy uncertainties may include activities such as the presidential elections in the US, government policies towards certain economic activities such as immigration and foreign aid, and the outcome of regional integration such as the European Union (EU).

In Nigeria, policy adjustments have significantly affected the economy (Nuhu & Isma'il, 2024), including the IMF-backed removal of oil subsidies and the floating of the Naira, Nigeria's official currency. In a similar vein, Salisu et al. (2023) constructed a GPR index for Nigeria by using social and political events that are more accurate for the Nigerian economy. They cited events like insurgent activities like attacks by the Boko Haram group and other affiliates like the Islamic State in Iraq and Syria (ISIS) that exist in northeastern Nigeria, banditry and kidnapping in the northwest, and the farmer-herder crisis in the middle belt of Nigeria as some of the sources of GPR in Nigeria. Ozili (2022) named a number of Nigeria-specific causes of EPU. These include sudden and unexpected actions by the central bank, changes in government policy after an election, political meddling in economic policymaking, a decline in oil prices around the world, oil price shocks with unclear government responses, a recession, and unethical public policy and practices. Despites the challenges that are instigated by these uncertainties and risks, many economies have continued to adopt strategies that will help in maintaining some form of stability for economic growth (Abiodun, Olawunmi & Toyin, 2024). Nigeria, one of the powerhouses in Africa, has one of the continent's largest economies (Salisu et al., 2024) and is blessed with abundant human and natural resources, the most common of which is crude oil, found in large quantities. It is also the most populated country in Africa, with over 140 million inhabitants made up of young people. The abundance of resources, large population, and resilient spirit of Nigerians have collectively contributed to their significant global influence (Ozili, 2022).

Over the past few years, Nigeria's economy has become more vulnerable to the ups and downs of geopolitical risk (GPR) and global economic policy uncertainty (GEPU) (Udeaja et al., 2024; Uche et al., 2022). This is because most reforms are pro-capitalism and prioritize liberalism over protectionism, leading to a greater interconnection with the global economy. As a result, Nigeria is susceptible to external shocks and fluctuations in the international market. The large disparity in income distribution within the country complicates the issue. EPU and GPR play a crucial but silent role in shaping the economy (Fakunmoju, 2024); this is because the interconnectedness of the world's economies is often downplayed by many policymakers, yet they determine a lot. They often appear when not considered, which is why they have serious effects on many economies. GPRs often have two forms of manifestation; they have direct consequences and indirect consequences (De Vijlder, 2023; Uche et al., 2022). It often leads to severe consequences, such as impacting the purchasing power of households and limiting the ability of firms to hire workers, which in turn affects the entire economy (De Vijlder, 2023). Despite the increase in research on the relationship between uncertainties and risk in recent times, especially as it affects areas like investment returns, oil prices, monetary policy, the financial system, regional integration, and economic growth, not much has been done for the

Nigerian economy, especially as it relates to economic growth and development. To the author's knowledge, no previous study has examined the influence of GEPU and GPR on economic growth in Nigeria. Previous research has demonstrated that these factors impact Nigeria, just like they do many other countries (Ajileye & Anyanwu, 2024). However, no study employed the use of econometric techniques to show the direction and extent of the relationship between GEPU, GRP, and economic growth in Nigeria.

This study seeks to add to the existing literature the outcome of the relationship between GEPU and GPR on economic growth in four ways. The first goal is to find the direction of the relationship between GEPU, EPU, and the combined effect of GEPU and GPR (GEPU*GPR) on economic growth in Nigeria during the study period. The second goal is to find out which of GEPU, GPR, and GEPU*GPR has the most significant impact on the Nigerian economy. The third goal is to look into the combined impact of GEPU and GPR on economic growth in Nigeria. The fourth part of the study uses quantile regression analysis to see whether the established relationship is significant or not across different quantiles.
The main objective of this research is to investigate the relationship between global economic policy uncertainty, geopolitical risk and economic growth in Nigeria; To ascertain the direction of relationship between GEPU and economic growth and GPR and economic growth in Nigeria. The specific objective is to determine the direction of relationship between the combined effect of GEPU and GPR on economic growth in Nigeria for the period of the study. Section 1 introduces the research work and then structures it as follows: Section 2 reviews relevant literature, Section 3 addresses data issues, and Section 4 focuses on data analysis and interpretation of results, while Section 5 summarizes, concludes, and recommends.

2 LITERATURE REVIEW

Since Caldera and Iecoviello (2018) introduced the data on measuring geopolitical risk (GPR) and Baker, Bloom, and Davis (2016) came up with data on EPU, the study of risks and uncertainty has been studied from different dimensions. Many scholars attempted to establish the relationship between these variables and other variables of interest, and several results have been documented. The literature primarily links GPR to finance behavior and investment returns. Scholars who examine the relationship between GPR and bitcoin returns and volatility include Aysan et al. (2019), who investigated the relationship between GPR and bitcoin returns and price stability. They found that changes in the global GPR index have predictive power on price volatility and returns of bitcoin by using the Ordinary Least Square (OLS) method. Quantile regression was also used, and it was found that a change in the global GPR index has a positive and statistically significant effect on both the price volatility and returns on bitcoin. In the same way, Antonakakis et al. (2017) looked into the time-varying stock oil covariance. They found that GPR affected both the returns and variances of these variables.

Gkillas et al. (2020) used a special type of statistical model called the quantile regression version of the Heterogeneous Autoregressive Realized Volatility (HAR-RV) model to study how well GPR can predict the ups and downs of gold returns. They concluded that using information contained in GPR, investors can improve the design of optimal portfolios involving gold to hedge against primarily long-run risks. Furthermore, Balcilar et al. (2018) discovered that the impact of GPR is different in the stock markets of Brazil, Russia, India, China, and South Africa (BRICS). This means that GPR tension news does not affect these markets' return dynamics. Their research also indicated that GPR has a more consistent effect on measures of market volatility than on returns. The finding suggests that these markets may experience volatility spillover because they are exposed to GPR tensions. On their part, Le and Tran (2021) discovered that GPR is negatively related to corporate investment after studying a sample of

96,618 firms across Asian emerging countries from the period 1995-2018. Their findings are in agreement with the real option theory that implies that firms are more likely to postpone investment to "wait and see" during periods of high uncertainty caused by GPR.
People who looked into the connection between EPU and other economic factors, like Demir et al. (2018), who used the EPU index to guess Bitcoin returns, found that EPU can guess Bitcoin returns, but the overall result indicated that Bitcoin returns and EPU are not related in a good way. After differencing by quantiles, however, they found that the effect of EPU on bitcoin returns is positive and significant at lower and higher quantiles. They therefore concluded that Bitcoin serves as a hedge against uncertainty. In a similar vein, Cheng and Yen (2020) adopted four countries as their case study to determine the direction of the relationship between EPU and Bitcoin returns. They found that changes in the rate of EPU in China can positively predict Bitcoin monthly returns, while changes in the EPU of the US, Japan, and South Korea showed no predictive ability for Bitcoin future returns. In 2022, Cai et al. found a link between the Bitcoin market and EPU. They used continuous wavelet analysis to look into the lead-lag relationship between the Bitcoin market and EPU in various time frequency domains. Their findings showed a negative correlation between Bitcoin returns and EPU during periods of increased awareness of Bitcoin and during the COVID-19 pandemic crisis, but only for the daily and monthly time series tests.

Nadia et al. (2024) investigated the influence of GPR and EPU on credit growth in Indonesia by using a sample of 47 Indonesian banks between the period 2008 to 2022. Their findings demonstrated a significant reduction in overall bank credit growth due to EPU and GPR. Looking at how GPR and EPU affect the Nigerian economy, Udeaja et al. (2022) used the autoregressive distributive lag (ARDL) method to examine the relationship between GPR and EPU and fiscal sustainability in Nigeria. They used quarterly data from 2010Q1 to 2021Q4 and found that GPR makes governments more responsible with their money in both the short- and long-term, but EPU has no effect on either of these times. In 2024, Fakunmoju used the ex-factor research design to look into the relationship between EPU and Nigeria's stock indices. The study used quarterly data from 2010 to 2023. The results showed that EPU, money supply, interest rate, and crude oil have a big impact on stock trade volume, which was used as a proxy for stock market development. Udeaja et al. (2024) investigated the relationship between globalization and GPR and stock market performance in Nigeria by employing the dynamic ordinary least squares method to analyze the data from 1985 to 2021. Their results indicated that globalization and GPR negatively and significantly affect the performance of the Nigerian stock market, whether measured by market capitalization or an all-share index. Uche et al. (2022) looked at data from 1981 to 2019 to see how EPU changed over time and how different parts of the Nigerian economy did. They used the Dynamic Autoregressive Distributive Lag (DARDL) and the Kernel Regularized Least Square (KRLS) to find that EPU had a long-term negative and significant relationship with all of the Nigerian economy's sectors, but it was strongest in the agricultural and services sectors.

These researchers, Adedoyin et al., (2020) used ARDL and the error correction model to look into how EPU and GRP affected the Malaysian economy from 1980 to 2018. They discovered that EPU harmed growth and that it slowed down exports, which in turn slowed down economic growth. Their result further indicated that GPR has both positive and negative effects on exports in both the short- and long-run periods, although the relationships are not significant. Ekeocha et al. (2023) used data from 2010 to 2019 and the quantile regression and generalized method of moments (GMM) methods to look at how EPU affected a group of 47 African countries. They found that global EPU and EPU from China, Canada, and the US exert considerable influence on the economic performance of African countries; domestic EPU and EPU from

Europe, Japan, the United Kingdom, and Russia are negligible. The evidence suggests that global EPU, EPU from North America, and China have a greater impact on African economies compared to those from Europe, the United Kingdom, and Russia. Researchers Anser et al. (2021) used the fully modified least squares and dynamic least squares methods to study how EPU and GRP affect environmental degradation. They found that EPU and nonrenewable energy use increase ecological footprints, while GPR and renewable energy use decrease them in some developing countries. They conclude that EPU can plunge economic growth and energy consumption, which in turn can ameliorate environmental quality. Monday and Osaretin (2024) used the ARDL method of data analysis on monthly data between the period of April 2016 to July 2022 to investigate the relationship between EPU and stock market index return in Nigeria, their findings indicate that EPU positively and significantly affect stock market returns in Nigeria. They further concluded that the positive effect is as a result of the individual investor's risk preference.

Li & Huang (2021) used the bootstrap rolling window causality test to investigate the relationship between China's economic policy uncertainty and the growth of the substantial economy. The result they got indicates that economic policy in China has a significant inhibiting effect on the development of a substantial number of economies. They further added that growth in the substantial economy will drive up economic policy uncertainty before 2016 but retain it afterwards. Perales & Borrego-Salcido (2024) looked at how GEPU impacted twenty countries in North and South America, Europe, Australia, and Asia by using monthly GEPU data and quarterly GDP data to represent economic growth from January 1997 to January 2021. They used the Mixed Data approach (MIDAS) for their analysis. The results showed that GEPU only affects a few of the countries directly, but it has a wider impact that causes effects in all the countries studied. The results indicated that GEPU directly affects only a few of the sample countries, but its broader influence causes effects across all the countries studied. They found that China exerts more influence on European countries' GDP than the US. The study also found similar results for the GDP of North and South American countries. Wen et al. (2021) applied the Non-Linear Autoregressive Distributive Lag (NARDL) method to monthly data from January 2011 to May 2020 to study how Economic Policy Uncertainty (EPU) affects economic growth in Pakistan, both in similar and different ways. They found that positive EPU shocks have a negative impact on short-run economic growth. They also discovered that the magnitude of positive shocks is greater than the magnitude of negative shocks. Luk et al. (2018) investigated the impact of EPU shocks in major economies on small open economies using Hong Kong as a case study. Their findings revealed that a sizeable spillover from EPU of major economies affects Hong Kong's economy. They added that a shock to uncertainty has a negative impact on the real output growth rate in Hong Kong.

3 METHODOLOGY

3.1 Theoretical framework

3.1.1 Classical theory of economic growth

This theory is one of the oldest theories on economic growth. The theory is centered around the work of scholars like Adam Smith, Thomas Malthus, David Ricardo, John Stuart Mills etc. the theory postulated that a country's economic growth will decrease with an increase in population and limited resource. They broadly maintain that continuous increase in the gross domestic product will lead to an explosion in the population, which will exert pressure on the nation's resources, which will consequently lead to a decline in the real gross domestic product. When the gross domestic product stagnates or decreases, economic growth will also follow suit in the decline.

3.1.2 Solow-Swan growth model

The Solow-Swan model was modelled by the duo of Robert Solow and Trevor Swan in the 1950s, the model looks at economic growth in the long run from the perspective of capital accumulation, population growth and increase in productivity that may arise as a result of technological progress. The model relied on the aggregate production function often demonstrated through the Cobb-Douglas in order to connect to microeconomics. This model is used to study growth in an economy over the long run. The model postulate that agents save a fixed fraction of their income, those savings sustain or increase the stock of capital. Capital saved is combined with labour to produce output, which is in turn paid to the owner of capital and to the workers. In summary, the model shows how a nation's total output is affected by the growth in capital stock, growth in labour force and advances in technology.

3.1.3 Endogenous growth theory

This theory states that economic growth is generated internally. The factors that lead to economic growth are found within the economy rather than from outside the economy. The theory argues that productivity that will drive development can be tied to faster innovation and more investment in human development from both government and private sector participants. The theory maintains that investment in human capital, innovation and knowledge are significant contributors to economic growth. The theory also focuses on positive externalities and spillover effects of a knowledge-based economy which will lead to economic development. Based on the three growth models identified above, this study adopts the endogenous growth model as the theoretical framework of this study as it is the most aligns with the methodology adopted.

3.2 Model specification

The method adopted for this research is quantile regression. The quantile regression is adopted in this case because it offers the advantage of using the median variance instead of the mean variance, which is common with the least squares method. The method has proven to be more robust against outliers in the response measurement (Miba'am and Güngör, 2025). It is an extension of the linear regression used in cases where conditions of linear regression are not fully met. Consequently, the study adopts a similar model by Mokni et al. (2021) with some modifications.

To determine if GEPU and GPR have an impact on economic growth in Nigeria, we consider a quantile regression augmented with dummy variables as follows:

$$Q_{LNGDP/U}(\tau) = \mu + \beta_{i,0}(\tau)U_{i,t} + \beta_{i,1}(\tau)D(U_{i,q0.10})U_{i,t} + \beta_{i,2}(\tau)D(U_{i,q0.50})U_{i,t} + \beta_{i,3}(\tau)D(U_{i,q0.90})U_{i,t} \quad (1)$$

Where $U_{i,t}$ is the log-difference of the uncertainty index i. $D(U_{i,q0.10})$, $D(U_{i,q0.50})$ and $D(U_{i,q0.90})$ denote dummy variables that assume value 1 if the log-difference of the categorical uncertainty index i exceeds the 10th, 50th and 90th quantiles respectively, and 0 otherwise. Similarly, $Q_{LNGDP/U}(\tau)$ is the τth quantile of LNGDP which is defined as:

$$Q_{LNGDP/U}(\tau) = F^{-1}{}_{LNGDP/U}(\tau); \tau \in [0.1]$$

$F_{LNGDP/U}(.)$ is the cumulative conditional distribution of economic growth given uncertainty level $U = u$

In order to draw a conclusion from the relationship between GEPU and GPR and economic growth in Nigeria, the uncertainty index is tested based on the dummy variable parameter. We draw a conclusion from the result of our analysis if the sum

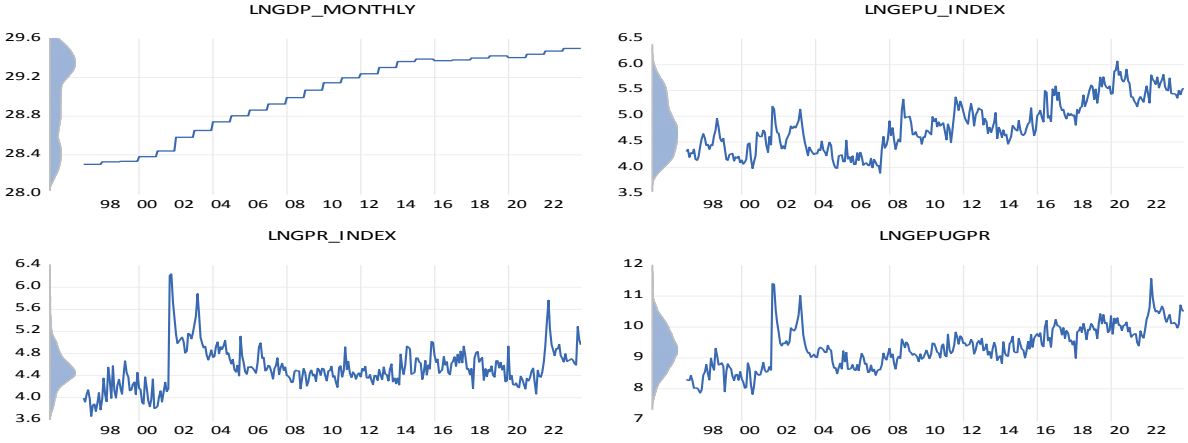
$\sum_{j=0}^{1} \beta_{i,j}(\tau)$, $\sum_{j=0}^{2} \beta_{i,j}(\tau)$, *and* $\sum_{j=0}^{3} \beta_{i,j}(\tau)$

is positively significant, then uncertainty and risk have a positive and significant relationship with economic growth for category i at 10%, 50% and 90% quantiles respectively for these categorical index. However, if the sum indicates a negatively insignificant, then uncertainty and risk have a negative and insignificant relationship with economic growth for category i, also at 10%, 50% and 90% quantiles respectively for this categorical index. The study adopts 10%, 50%, and 90% quantiles to represent the lower, middle, and upper quantiles, respectively. The reason for adopting the respective quantiles is to capture different economic conditions represented by each quantile. Common with quantile regression, the study categorizes the quantiles in terms of recession, normal, and boom, where the lower quantile signifies recession, the middle quantile signifies a normal period, and the higher quantile signifies a boom period.

3.3 Data

The study employed the use of monthly data for the analysis; data were sourced from three different sources. GPEU was sourced from the Economic Policy Uncertainty Index at www.policyuncertainty.com by Baker et al. (2016), while GPR was sourced from the Geopolitical Risk Index at www.matteoiecoviello.com by Caldera and Iecoviello (2018). The GDP of Nigeria was used as the proxy for economic growth; it was sourced from the World Bank Development Indicators at www.data.worldbank.org. We obtained the GEPU and GPR in their monthly form, and the GDP in its annual form. The study employed the use of monthly data because of the availability of the two independent variables in their monthly form. Since the independent variables are the determining factor, it is logical to adopt the monthly data for the analysis by converting the dependent variable from its annual form to a monthly form. Similarly, most studies that involve uncertainty and risk are done using daily, weekly, monthly, and quarterly data because uncertainty and risk are variables that occur in high frequency (Salisu et al., 2023; Udeaje et al., 2022; Korsah and Mensah, 2023). To maintain uniformity, the GDP data was converted from annual to monthly using the EViews application by using the specify by frequency range function and thereafter choosing the monthly range, which automatically converts the data from low frequency (annual) to high frequency (monthly) data. Data availability strictly influences the data used, spanning from January 1997 to December 2023.

Figure 1: Showing LNGDP, LNGEPU, LNGPR and LNGEPU*GRP



From figure 1 above, we can see the trend in the variable on a monthly basis. LNGDP shows a constant increase in the monthly GDP of Nigeria from January 1997 up until December 2023, although the growth rate increased at a decreasing rate after 2016. LNGEPU shows upward and downward movement with a fairly equal upward and downward movement between 1997

up to around 2010, but with a steady increase after 2010, owing to an increase in global EPU within the time. On the other hand, LNGPR shows peaks between 2001 and 2005 and around 2023, when geopolitical risk has been at its peak. In the same way, the LNGEPU*GPR variable, which shows the combined effect of uncertain global economic policy and geopolitical risk, reached its highest point around 2001–2003. It then moved fairly steadily until around 2021, when it reached its highest point again due to rises in both GEPU and GPR.

4 RESULTS AND DISCUSSION OF FINDINGS

4.1 Descriptive statistics

Table 1 below consist of the descriptive statistics and the correlation matrix for the data used for the analysis.

Table 1: Descriptive statistics and correlation matrix

Panel A: Descriptive Statistics

	LNGDP	LNGEPU	LNGPR	LNGEPU*GPR
Mean	29.01735	4.815188	4.536586	9.351774
Median	29.14637	4.764223	4.500823	9.310017
Maximum	29.502	6.06793	6.239359	11.56436
Minimum	28.30181	3.896468	3.664731	7.825134
Std. Dev.	0.407276	0.499615	0.36545	0.664712
Skewness	-0.512279	0.310296	1.00626	0.292736
Kurtosis	1.796906	2.147427	6.132181	2.97252
Jarque-Bera	33.71159	15.01219	187.1207	4.63768
Probability	0	0.00055	0	0.098388
Sum	9401.622	1560.121	1469.854	3029.975
Sum Sq. Dev.	53.57732	80.62585	43.13774	142.7149
Observations	324	324	324	324

Panel B: Correlation Matrix

Correlation Covariance	LNGDP	LNGEPU	LNGPR	LNGEPU*GPR
LNGDP	1			
	(0.165362)			
LNGEPU	0.719468	1		
	(0.145947)	(0.248845)		
LNGPR	0.188378**	0.160673**	1	
	(0.027951)	(0.029246)	(0.133141)	
LNGEPU*GPR	0.644339	0.839963	0.670553	1
	(0.173898)	(0.278091)	(0.162387)	(0.440478)

Note: Panel A is the descriptive statistics for the variables. Panel B is the Correlation matrix for the variables of study. ** represent acceptance level at 5% significant level

Source: Author's compilation

Panel A of Table 1 reveals that LNGDP has the highest mean, followed by LNGEPU*GPR, and then LNGEPU and LNGPR. The medians for LNGDP, LNGEPU, LNGPR, and LNGEPU*GPR are, respectively, 29.14637, 4.764223, 4.500823, and 9.351774. LNGDP has the highest maximum value, while LNGPR has the minimum value. LNGEPU*GPR has the highest standard deviation, followed by LNGEPU, LNGDP, and LNGPR, respectively. Only LNGDP is negatively skewed; LNGEPU, LNGPR, and LNGEPU*GPR are positively skewed, indicating that their tail extends towards the right of the normal distribution. LNGDP and LNGEPU have lower kurtosis values, which means they are platykurtic, which means they

have a flat curve. Only LNGEPU*GPR is mesokurtic, which means it has a normal curve since its value rounds up to 3. LNGPR, on the other hand, has a sharp peak that can be affected by outliers. The Jaque-Bera result shows that none of the variables are normally distributed because they are all less than 0.05. The only variable that is not normally distributed is LNGEPU*GPR, which has a probability value of 0.098. This means that we accept the alternative hypothesis that LNGEPU*GPR is not normally distributed, but we reject the null hypothesis that it is normally distributed. Panel B in Table 1 represents the correlation matrix for the variables, also showing the covariance that helps in showing whether a variable is statistically significant or otherwise. The result indicates that all the variables are positively related, even though only LNGDP and LNGPR as well as LNGEPU and LNGPR are statistically significant.

4.2 Unit root test

The unit root test is used to ascertain the stationarity of the variables of study; they are adopted to ensure that the variables are integrated in the right form. The Augmented Dickey-Fuller (ADF) test is widely used for ensuring the stationarity of the variable so as to avoid making conclusions that are spurious or misleading.

Table 2: Unit root test

	ADF		
	Without trend	With trend	Level of integration
LNGDP	-1.979474 (0.2959)	-1.005042 (0.9406)	Not Integrated
LNGEPU	-1.919705 (0.3230)	-5.570982*** (0.0000)	Integrated
LNGPR	-6.124462*** (0.0000)	-6.225327*** (0.0000)	Integrated
LNGEPU*GPR	-4.252828*** (0.0006)	-6.235014*** (0.0000)	Integrated
ΔLNGDP	-2.424298 (0.1359)	-2.983029* (0.108)	Integrated
ΔLNGEPU	-14.01628*** (0.0000)	-13.99543*** (0.0000)	Integrated
ΔLNGPR	-17.03034*** (0.0000)	-17.00348*** (0.0000)	Integrated
ΔLNGEPU*GPR	-15.92845 (0.0000)	-15.90339 (0.0000)	Integrated

***, **, * indicates level of significance at 1%, 5% and 10% respectively.

Source: Author's compilation

The unit root test in Table 2 above reveals that all the variables integrate at least at the first difference. LNGDP was not integrated at levels for both intercept and trend; however, on first differencing, it became integrated at a 10% level of significance. Similarly, the LNGEPU, which is the proxy for global economic policy uncertainty, is integrated at the level and therefore at the first difference, both times at the 1% level of significance. LNGPR also exhibits integration at a 1% significance level, at both levels and at the first difference. The outcome remains consistent for LNGEPU*LNGPR, demonstrating integration at both the level and the

first difference. Having established the existence of integration with the study's data, the study proceeds with the methodology.

4.3 **Discussion of findings**

The quantile regression involves the use of median value with the aim of solving the problem of heteroskedasticity (Miba'am and Güngör, 2025). We test the research model (1) at 9 quantiles (0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9) to capture different economic conditions across three economic levels. The levels will be low, middle, and high. In the same line, the quantile will be estimated at 0.1, 0.5, and 0.9, respectively.

The result for the quantile regression is provided in Table 3 below.

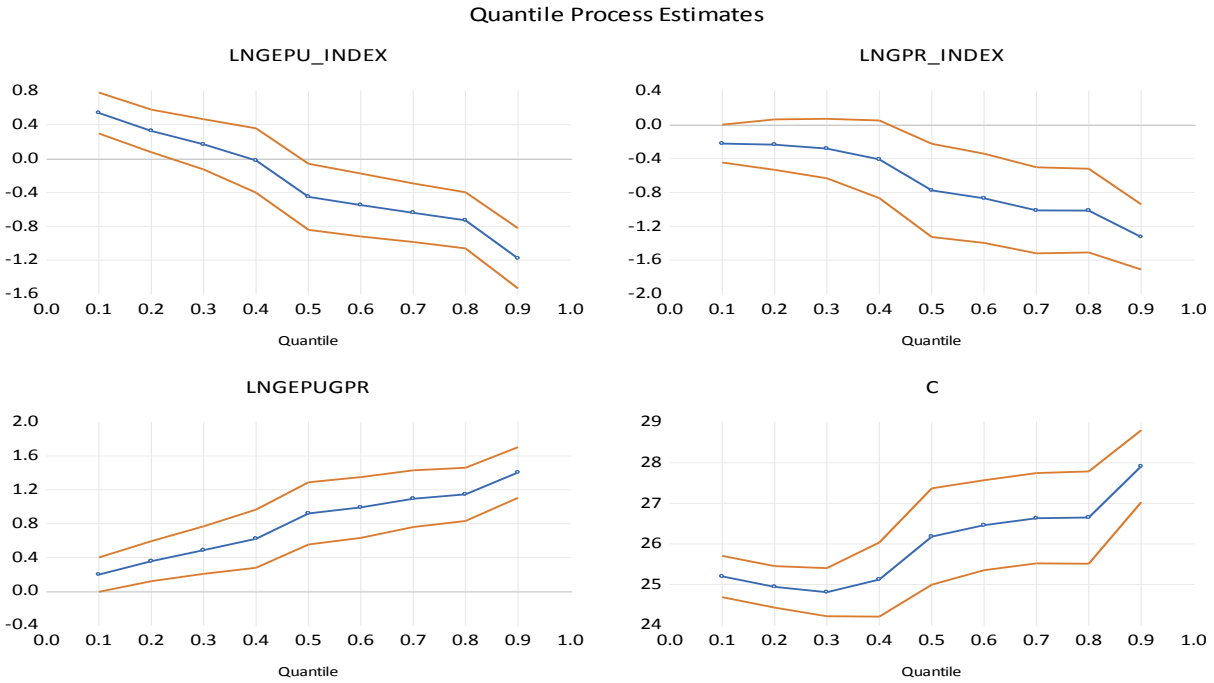
Table 3: Quantile regression result

	Low			Middle			High		
t	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
LNGEPU	0.538*** (0.0000)	0.326*** (0.0114)	0.167 (0.2698)	-0.023 (0.9063)	-0.453** (0.0235)	-0.549*** (0.0040)	-0.640*** (0.0003)	-0.730*** (0.0000)	-1.178*** (0.0000)
LNGPR	-0.224** (0.0500)	-0.235 (0.1223)	-0.282 (0.1177)	-0.409* (0.0809)	-0.776*** (0.0061)	-0.869*** (0.0013)	-1.012*** (0.0001)	-1.015*** (0.0001)	-1.326*** (0.0000)
LNGEPU*GPR	0.197* (0.0587)	0.356*** (0.0035)	0.487*** (0.0008)	0.622*** (0.0005)	0.921*** (0.0000)	0.991*** (0.0000)	1.095*** (0.0000)	1.146*** (0.0000)	1.404*** (0.0000)

Note: ***, **, * represents significant level at 1%, 5% and 10% respectively.

Source: Author's compilation

Figure 2: Quantile regression process graph at 0.5 quantile estimate including constant.



From the quantile regression output in Table 3 above, where the result is separated into low, middle, and high quantiles to represent different times within the Nigerian economy. The low quantile consists of 10%, 20%, and 30% of the quantiles, while the middle quantile consists of 40%, 50%, and 60% of the quantiles, and the high quantile consists of 70%, 80%, and 90% of the quantiles. The quantile regression result indicates that LNGEPU is positive and

significantly related to economic growth at the low quantiles of 10% and 20%, while it is positively related but not significantly at 30%. As you moved toward the middle quantile, the relationship between LNGEPU and economic growth started to go down. At the 40% quantile, it was no longer positively related to growth, but it was statistically significant at the 50% and 60% quantiles. The result further shows that LNGEPU is negatively and statistically significantly related to economic growth at the high quantiles of 70%, 80%, and 90%, respectively.

On the other hand, LNGPR shows a negative result across the three different quantiles. In the lower quantile, only the 10% part is statistically significant at 5%; the 20% and 30% parts are not statistically significant. 40%, 50%, and 60% of the middle quantiles are statistically significant at 10%, 1%, and 1%, respectively. The higher part of the quantile shows that the 70%, 80%, and 90% parts of the high quantile are all statistically significant at the 1% level. All the quantiles show a negative relationship between economic growth and the combined effect of GEPU and GPR (LNGEPU*GPR). The result indicates that only the 0.1 part of the low quantile is statistically significant at 10%; all the other parts of the low quantile, the middle quantile, and the high quantile are statistically significant at the 1% level. We can tell from the interpretation of the results that global economic policy uncertainty doesn't have a negative effect on the economy when it's in a recession. This could mean that the factors inside the economy have a bigger effect than the factors outside the economy. As a result, EPU during times of local economic problems may offer some relief, especially when the recession is severe. However, when the economy is in normal times, i.e., not experiencing recession or boom, global EPU will have a negative impact on the economy in a significant proportion. Furthermore, the result indicates that global economic uncertainty is likely to affect the economy the most when the economy is experiencing a boom. This is because, at this point, the economy is operating at its peak; therefore, any sudden changes that may be triggered by external forces, such as EPU, will lead to a sudden decline, which can set the tone for a rapid decline.

The results also demonstrate a negative relationship between LNGPR and economic growth across all quantiles. There is a statistically significant negative correlation between LNGPR and economic growth at the 0.1 level of the lower quantile. The result shows a negative relationship at the 0.2 and 0.3 parts, but it is not statistically significant. However, the middle and higher quantiles indicate a negative and significant relationship across the quantiles. Again, from the result, we can deduce that geopolitical risk has a negative effect on economic growth across the different levels of the state of the economy. The result indicates that GPR causes a fall in economic growth more during an economic boom than during a normal period or a recession. During a recession, geopolitical risk will hurt the economy, but not as much as during a boom or normal period.

Once more, the results show that LNGEPU*GPR, which stands for the effect of uncertain global economic policy and geopolitical risk, is favorably linked to economic growth across all quantiles. The result reveals a link between LNGEPU*GPR and economic growth at the 10% level of significance, specifically in the 0.1 part of the low quantile. From there, all parts of the quantile are positively linked to economic growth at the 1% level of significance. This means that when economic factors are considered together, they might have a different effect than when considered individually. Similarly, sometimes, GPR can work in favor of certain economies at the same time it is working against the interests of other economies; e.g., the US-China trade war benefited some countries as the trade tariffs forced the two giant economies to look elsewhere for the supply of the goods that had suffered from the tariffs and embargoes.

As shown in Table 3, the result shows that GPR has a bigger effect on the economy than GEPU. At the lower quantile, GEPU has more influence, though it's a positive influence, while GPR

is negatively related. However, as you move up the quantiles, GPR starts to have more influence than GEPU.

Overall, the result indicates a negative relationship between global economic policy uncertainty, geopolitical risk, and economic growth in Nigeria. From the result, we see that GEPU has a positive relationship with economic growth during period of recession, perhaps because of the slowdown of economic activities within the economy; therefore, any little influence from outside of the economy may attract some level of confidence. However, as the economy begins to recover, the relationship turns negative. During normal periods, GEPU negatively affects the Nigerian economy. World events, such as the US election or global financial crises in the US or some European countries, can significantly impact it during these times. The negative relationship becomes sharper when the economy is booming; that is, the Nigerian economy is susceptible to exogenous variables when it is at its peak and therefore will respond sharply to external factors. On the other hand, geopolitical risk has a negative relationship with economic growth during recession, normal times, and boom. It does not matter the state of the economy; whenever there is geopolitical risk within Nigeria or around Nigeria, the economy reacts negatively. This indicates that the economy only responds negatively to geopolitical risk. We can also conclude that GPR has a greater impact on economic growth in Nigeria than GEPU. The analysis shows that global economic policy uncertainty, geopolitical risk, and economic growth are closely linked, meaning that because countries are interacting more due to globalization, no country can operate alone. If the study had only looked at one economic period without breaking it down into recession, normal, and boom times, the relationship between global geopolitical risk and economic growth would have been either only positive or only negative. If the study employed the use of only one economic period, the result would have been different; by not dividing the quantile periods into recession, normal, and boom, the relationship between global geopolitical risk and economic growth would either be positive only or negative only. However, employing different quantiles has enhanced the robustness of the findings of this study and enabled meaningful conclusions and recommendations to be drawn from it.

However, when the two variables are considered jointly, they exert a positive influence on economic growth, an indication that not all uncertainties and risks have a negative influence all the time; their interplay, depending on the type of uncertainty and risk, may end up leading to a positive impact. Given the dynamic interplay of the factors that affect the economy and the fact that global economic policy uncertainty has some positive impact on the Nigerian economy, especially when the economy is in recession, the result indicates that global economic policy uncertainty exerts more influence on the Nigerian economy than geopolitical risk; hence, when the two variables are combined, the influence of global economic policy uncertainty dominates that of geopolitical risk, leading to a combined positive influence.

Figure 2 provides a graphical representation of the estimated parameters, illustrating the movement of the variables against the quantile orders. We observe two main types of movements: both the GEPU and GPR decrease as the quantile increases. The GPR is negative across all quantiles, but the GEPU is going down more than the GPR, even though it was positive at the lower quantile. The figures substantiate the fact that GEPU and GPR have a negative influence on economic growth. However, the combined effect of GEPU and GPR increases consistently with quantiles, with the latter increasing more steadily than the former. The constant is increasing in line with economic principles, indicating that the economy will always increase when no external factor is affecting it.

5 Summary, conclusion and recommendation

The study investigates the relationship between global economic policy uncertainty and geopolitical risk and their effect on economic growth in Nigeria between the period of January 1997 and December 2023 by adopting the quantile regression method for the data analysis. The study is motivated by the dearth of empirical literature on the relationship between uncertainty and risk and economic growth, especially for developing countries like Nigeria.

The empirical result shows that global economic policy uncertainty and geopolitical risks have a negative influence on economic growth. The result indicates that when the economy is in a recession, global economic policy uncertainty has a positive relationship with economic growth. The implication is that the economy can be open to exogenous factors during recession period with the view to allowing exogenous variables to contribute to the recovery of the Nigerian economy.

Geopolitical risk exerts more influence on economic growth than global economic policy uncertainty, especially at the middle and higher quantiles. This finding indicates that when the economy is in normal times and in a boom period, then geopolitical risk can have more impact than global economic policy uncertainty. The result generally indicates that geopolitical risk has a negative relationship with economic growth; geopolitical risk that may arise from within Nigeria or outside of Nigeria but has an impact on the Nigerian economy affects the economy negatively. Implying that the Nigerian economy is more sensitive to geopolitical risk.

Meanwhile, the study found that the combined effect of global economy policy uncertainty and geopolitical risk has a positive impact on the economy. The novelty of the research work is that it extends the impact of uncertainty and risk to macroeconomics, particularly economic growth. Previous studies limit their research to the financial and capital market, while economic growth is neglected.

The study will add to existing literature on the effect of uncertainty and risk on economic growth, and at the same time, future research can investigate the relationship between economic policy uncertainty, geopolitical risk, and economic growth in developed and developing countries. Researchers can also explore this relationship across a panel of countries.

The study recommends the Central Bank of Nigeria (CBN) and other monetary and fiscal policy related agencies make robust monetary and fiscal policies to further strengthen the Nigerian economy. The national assembly of Nigeria must make legislation that can promote a virile and diversified economy that can withstand all forms of exogenous influence while the executive arm must uphold its primacy by implementing these policies. Furthermore, for the economy to prosper, human capital development can never be overemphasized; therefore, the federal ministry of labour and productivity and other supporting agencies such as national directorate of employment (NDE) should push for policies that aim to further develop human capital within Nigeria and also ensure that those factors that lead to the migration of skilled workers to other countries are taken care of so that the issue of brain drain will be tackled accordingly. Lastly, the Federal state and local government are encouraged to participate more in the activities of international organizations so as to encourage peace and harmony among countries around the world with a view to reducing the negative effects of globalization while promoting the positive ones.

The study is limited by the number of variables used; incorporating control variables would add more value to the paper by giving more robust and supporting findings that could align with economic theories and previous findings in research with similar problems. Secondly, the use of monthly data for economic growth may not be very suitable. Most studies on economic growth employ the use of annual data for analysis; however, in this case, the data for GPR is limited to 1997, hence making it unsuitable for annual data analysis because of the limited number of observations.

REFERENCES

Abiodun, A. I., Olawumni, O & Toyin, O. A. (2024). Fiscal deficit and economic performance in Nigeria. *Journal of Economics and Allied Research,* 9 (4), 108-120.

Adedoyin, F. F., Afolabi, J. O., Yalçiner, K., & Bekun, F. V. (2020). The export-led growth in Malaysia: Does economic policy uncertainty and geopolitical risks matter? *Journal of Public Affairs*, 22(1). https://doi.org/10.1002/pa.2361

Ajileye, B. T. & Anyanwu, S. O. (2024). Effect of institutional quality, diaspora remittances and foreign direct investment on economic growth in West Africa monetary zone. *Journal of Economics and Allied Research*, 9 (3), 43-53.

Anser, M. K., Syed, Q. R., Lean, H. H., Alola, A. A., & Ahmad, M. (2021). Do Economic Policy Uncertainty and Geopolitical Risk Lead to Environmental Degradation? Evidence from Emerging Economies. *Sustainability*, 13(11), 5866. https://doi.org/10.3390/su13115866

Antonakakis, N., Gupta, R., Kollias, C. & Papadamou, S. (2017). Geopolitical risks and the oil-stock nexus over 1899–2016. *Finance Research Letters*, 23: 165–173. http://dx.doi.org/10.1016/j.frl.2017.07.017.

Aysan A. F., Demir, E., Gozgor, G. & Lau, C. K. M. (2019). Effects of the geopolitical risks on bitcoin returns and volatility. *Research in International Business and Finance*, 47: 51-518. https://doi.org/10.1016/j.ribaf.2018.09.011

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. The *Quarterly Journal of Economics*, 131(4), 1593–1636.

Balcilar, M., Bonato, M., Demirer, R. & Gupta, R. (2018). Geopolitical risks and stock market dynamics of the BRICS. *Economic Systems* 42: 295–306. https://doi.org/10.1016/j.ecosys.2017.05.008

Cai, Y., Zhu, Z., Xue, Q. & Song, Z. (2022). Does bitcoin hedge against the economic policy uncertainty: based on the continuous wavelet analysis. *Journal of Applied Economics*, 25(1) 983-996. https://doi.org/10.1080/15140326.2022.2072674

Caldara, D., & Iacoviello, M. (2018). Measuring geopolitical risk. International Finance Discussion Paper No. 1222. Board of Governors of the Federal Reserve System. https://www.federalreserve.gov/econres/ifdp/files/ifdp1222.pdf

De Vijlder, W. (2023). Global economy: The economic consequence of geopolitical uncertainty. EcoWeek, Editorial. Economic-research.bnpparibas.com

Demir, E., Gozgor, G., Lau, C. M. K. & Vigne, S. A. (2018). Does economic policy uncertainty predict the Bitcoin returns? An empirical investigation. *Finance Research Letters* 26, 145–149. https://doi.org/10.1016/j.frl.2018.01.005.

Ekeocha, D. O., Ogbuabor, J. E., Ogbonna, O. E., & Orji, A. (2023). Economic policy uncertainty, governance institutions and economic performance in Africa: are there regional differences? *Economic Change and Restructuring*, 56(3), 1367–1431. https://doi.org/10.1007/s10644-022-09472-7

Fakunmoju, S. K. (2024). Economic policy uncertainty and stock market development in Nigeria. *Modern Management Review*, 29(4), 29–42. https://doi.org/10.7862/rz.2024.mmr.18

Gkillas, K., Gupta, R. & Pierdzioch, C. (2020). Forecasting realized gold volatility: Is there a role of geopolitical risks? *Finance Research Letters* 35: 101280. https://doi.org/10.1016/j.frl.2019.08.028.

Korsah, D., & Mensah, L. (2023). Geopolitical risk, economic policy uncertainty, financial stress and stock returns nexus: evidence from African stock markets. *Journal of Capital Markets Studies*, 8(1), 25–42. https://doi.org/10.1108/jcms-08-2023-0031

Le, A. & Tran, T. P. (2021). Does geopolitical risk matter for corporate investment? Evidence from emerging countries in Asia. *Journal of Multinational Financial Management*, 62: 100703. https://doi.org/10.1016/j.mulfin.2021.100703

Li, J., & Huang, S. (2021). The dynamic relationship between economic policy uncertainty and substantial economic growth in China. *Marine Economics and Management*, 4(2), 113–134. https://doi.org/10.1108/maem-04-2021-0003

Luk, P., Cheng, M., Ng, P., & Wong, K. (2018). Economic policy uncertainty spillovers in small open economies: The case of Hong Kong. *Pacific Economic Review*, 25(1), 21–46. https://doi.org/10.1111/1468-0106.12283

Miba'am, B. W., & Güngör, H. (2025). Do Uncertainties in US Affect Bitcoin Returns? Evidence from Time Series Analysis. *Computational Economics*. https://doi.org/10.1007/s10614-024-10842-8

Mokni, K., Bouri, E., Ajmi, A. N., & Vo, X. V. (2021). Does bitcoin hedge categorical economic uncertainty? A quantile analysis. *SAGE Open*, 11(2). https://doi.org/10.1177/21582440211016377

Monday, U. & Osaretin, I. A. (2024). Economic policy uncertainty, macroeconomic volatility and stock market behaviour in Nigeria. *Journal of Economics and Allied Research*, 9 (4), 108-120.

Nadia, L. P., Krisnanda, K., Sa'adah, W. N., & Yasin, R. M. (2024). Do geopolitical risk and economic uncertainty harm bank Credit ? *Jurnal Riset Ilmu Ekonomi*, 4(1), 58–74. https://doi.org/10.23969/jrie.v4i1.121

Nuhu, Z. & Isma'il, M. (2024). Financial sector development and economic growth in Nigeria. *Journal of Economics and Allied Research*, 9 (3), 327-344.

Ozili, P. K. (2022). Sources of Economic Policy uncertainty in Nigeria: Implications for Africa. In Contemporary studies in economic and financial analysis (pp. 37–50). https://doi.org/10.1108/s1569-37592022000108a031

Perales, G. B., & Borrego-Salcido, C. (2024). Global economic policy uncertainty and global economic leaders' influence on regional economic growth. *Revista Mexicana de Economía y Finanzas, Nueva Época*, 19(4), 1–22. https://doi.org/10.21919/remef.v19i4.1126

Salisu, A., Salisu, S., & Salisu, S. (2023). Constructing geopolitical risk index for Nigeria. *Scientific African*, 22, e01948. https://doi.org/10.1016/j.sciaf.2023.e01948

Salisu, A., Salisu, S., & Salisu, S. (2024). A news-based economic policy uncertainty index for Nigeria. Quality & Quantity, 58(5), 4987–5002. https://doi.org/10.1007/s11135-024-01886-x

Sokunbi, A. R., Olayinka, I. R., Aworinde, B. T., Taiwo, A. & Musa, C. O. (2024). Fiscal policy and economic growth in Nigeria. *Journal of Economics and Allied Research*, 9 (3), 1-13

Uche, E., Okoronkwo, C., Nwamiri, S. I., & Chukwu, U. O. (2022). Sectoral performances and economic policy uncertainty in an emerging economy. *Studies of Applied Economics*, 40(3). https://doi.org/10.25115/eea.v40i3.7853

Udeaja, E. A., Zimboh, S. T., Offum, P. F., & Fashoro, B. F. (2022). Do Geopolitical Risks and Economic Uncertainty Matter for Fiscal Sustainability in Nigeria? *Economic and Financial Review*, Volume (60)2. Central Bank of Nigeria.

Udeaja, E., Offum, P., Ifejimalu, K., & Okafor, S. (2024). Do globalization and geopolitical risks matter for stock market performance in Nigeria? Financial Economics Letters, 3(3), 36–51. https://doi.org/10.58567/fel03030004.

Wang, Z., & Sibt-E-Ali, M. (2024). Financial globalization and economic growth amid geopolitical risk: A study on China-Russia far East federal district. Heliyon, 10(10), e31098. https://doi.org/10.1016/j.heliyon.2024.e31098

Wen, J., Khalid, S., Mahmood, H., & Yang, X. (2021). Economic policy uncertainty and growth nexus in Pakistan: a new evidence using NARDL model. Economic Change and Restructuring, 55(3), 1701–1715. https://doi.org/10.1007/s10644-021-09364-2

Yen, K., & Cheng, H. (2020). Economic policy uncertainty and cryptocurrency volatility. Finance Research Letters, 38, 101428. https://doi.org/10.1016/j.frl.2020.101428