The Effect of Global Economic Policy Uncertainty on Selected Islamic Stock Market Returns

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ABSTRACT

Purpose - The purpose of this study is to investigate the effects of global economic policy uncertainty (GEPU) and take into consideration the oil price of the control variable on 10 Islamic stock markets' returns across 10 Islamic stock market indices.

Design/methodology/approach - Dow Jones Islamic Market (DJIM), Saudi Arabia, Malaysia, United Arab Emirates (UAE), Kuwait, Qatar, Turkey, Indonesia, Bahrain, Pakistan—for 20 years from 25 September 2003 to 24 September 2023. This study used Markov Switching Model and Wavelet Coherence for the robustness test. The findings also showed that GEPU had significant negative effects on returns for all countries except Saudi Arabia, Kuwait, and Qatar.

Findings - Overall findings show GEPU significantly impacts the returns of these selected Islamic stock markets. These findings have ramifications for investors looking for trading tactics to help fulfill their financial goals and for investors seeking to diversify their portfolios to maximize return and minimize risk. The results also inform policymakers about the current state of Islamic stock markets.

Originality/value - It addresses a gap in the existing literature, provides insights with practical implications for investors and policymakers, and contributes to the broader understanding of how global economic uncertainties influence financial markets, particularly those operating under Islamic principles.

Research limitations - Researchers can mitigate some limitations through robust methodological approaches, sensitivity analyses, and leveraging multiple data sources to cross-validate results.

Keywords: Global Economic Policy Uncertainty, Islamic stock market, Markov Switching Model, Wavelet Coherence.

INTRODUCTION

Islamic finance, guided by Sharia principles, has witnessed substantial growth in recent decades, emerging as a viable alternative to conventional financial systems. Central to Islamic finance is the prohibition of interest (riba) and involvement in activities deemed morally or ethically unacceptable (haram). This ethical framework extends to Islamic stock markets, which operate by Sharia principles. Islamic stock markets adhere to Sharia-compliant investment guidelines, ensuring that listed companies engage in permissible business activities and comply with Islamic ethics. This includes sectors such as alcohol, gambling, tobacco, and conventional finance, which are typically excluded from Islamic investment portfolios.

Islamic stock markets often feature specialized indices, such as the Dow Jones Islamic Market Index (DJIMI) and the FTSE Shariah Global Equity Index, which track Sharia-compliant companies globally. These indices serve as benchmarks for Islamic investors, facilitating the construction of diversified portfolios aligned with Sharia principles. Despite sharing similarities with conventional stock markets, Islamic stock markets exhibit distinct characteristics, such as lower leverage ratios, higher levels of corporate governance, and a focus on real economic activities. Additionally, Islamic finance principles emphasize risk-sharing and asset-backed transactions, fostering stability and resilience within Islamic stock markets (Sheikh and Ali, 2024).

Islamic stock markets, like their conventional counterparts, are not immune to the forces of economic uncertainty (Delle and Panetta, 2020). Economic uncertainty can stem from various sources, including geopolitical tensions, regulatory changes, macroeconomic fluctuations, and global events. Uncertainty introduces volatility into financial markets, influencing investor behavior, asset pricing, and market dynamics.

In Islamic stock markets, uncertainty poses unique challenges and opportunities. Sharia-compliant investment principles inherently prioritize stability, transparency, and ethical conduct. Consequently, Islamic investors may exhibit different risk preferences and responses to uncertainty compared to conventional investors (Bilgin et al., 2021). One key aspect of uncertainty in Islamic stock markets is compliance with Sharia principles amidst evolving regulatory landscapes and market conditions. Regulatory changes or ambiguities in Sharia compliance standards can introduce uncertainty regarding the permissibility of certain investment instruments or business activities. This uncertainty can impact investor confidence and asset valuations, leading to fluctuations in Islamic stock market returns (Ftiti and Hadhri, 2019).

Global economic uncertainty also reverberates through Islamic stock markets, as they are interconnected with the broader financial system. Economic events like financial crises, trade tensions, or currency fluctuations can spill over into Islamic markets, affecting investor sentiment and market sentiment (Qi et al., 2022). Additionally, the interconnectedness of Islamic finance with conventional finance exposes Islamic stock markets to systemic risks arising from global economic uncertainty (Shahzad et al., 2017). Understanding the interplay between uncertainty and Islamic stock markets is crucial for investors, policymakers, and market participants. Research into the impact of uncertainty on Islamic stock market returns can offer valuable insights into the resilience, risk management practices, and investment strategies within Islamic finance. Moreover, efforts to enhance transparency, regulatory clarity, and Sharia compliance standards can help mitigate uncertainty and foster confidence in Islamic stock markets, contributing to their long-term growth and sustainability (Karim et al., 2013).

Global economic policy uncertainty has become a prominent factor influencing financial markets worldwide. This uncertainty is often accompanied by heightened volatility, which can significantly impact investor sentiment and market performance. Within the context of Islamic finance, where adherence to Sharia principles is paramount, understanding the implications of global economic policy uncertainty and volatility on Islamic stock market returns is crucial. Despite the growing recognition of the importance of these factors, there remains a gap in the literature regarding the specific effects on selected Islamic stock markets. Therefore, this study aims to investigate the relationship between global economic policy uncertainty, as measured by relevant indices, and its effect on the returns of selected Islamic stock markets. By addressing this gap, the research seeks to provide valuable insights for investors, policymakers, and market participants navigating the complex interplay between economic policy uncertainty and Islamic finance principles.

LITERATURE REVIEW

There has been increasing interest in economic policy uncertainty (EPU) as a result of global economic policy uncertainty (GEPU). GEPU Index is a GDP-weighted average of 21 national EPU indices: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the UK, and the US. It refers to the non-zero likelihood of existing economic policies changing, which determines the game rules for economic agents (Baker et al., 2016). The impact of EPU on asset values can be seen in various ways. First, policy uncertainty may cause enterprises and other economic agents to change or delay crucial actions such as hiring, investing, consuming, and saving (Gulen and Ion, 2016). Second, policy uncertainty may increase finance and manufacturing costs by impacting both supply and demand channels, resulting in increased disinvestment and economic contraction. Third, EPU may increase risks in financial markets by lowering the value of government-provided market protection (Pastor and Veronesi, 2012). Finally, economic uncertainty may alter the predicted inflation, interest rate, and risk premium (Pastor and Veronesi, 2013).

The results of Bakas et al. (2018) revealed that Jurado et al., (2015) unobservable economic uncertainty indicators had a large and long-lasting positive effect on commodity price volatility. The researchers discovered that a sudden and unforeseen increase in macroeconomic and financial uncertainty led to a persistent surge in the volatility of the broad commodities market index and individual commodity prices. Notably, the macroeconomic impact was more pronounced, indicating a significant influence on the commodities market. Changes in EPU are likely to affect asset prices by influencing both predicted company cash flows and discount rates. Some empirical studies have validated this impact. Kang and Ratti (2013) employed a vector autoregressive (VAR) model analysis to show that an increase in EPU Granger led to a fall in market returns in the US. Antonakakis et al. (2013) used a DCC GARCH model to show that the correlations between US stock market returns, volatility, and economic policy uncertainty changed over time and that an increase in EPU lowered stock market returns. Chang et al. (2015) studied whether EPU was linked to stock markets for a sample of seven Organization for Economic Co-operation and Development (OECD) nations. The study revealed that changes in economic policies in the United States and the United Kingdom led to a decline in stock prices. Furthermore, the researchers found that economic policy uncertainty in the United States had a ripple effect on global oil prices, influencing their worldwide dynamics.

Bams et al. (2017) showed a large negative return on economic uncertainty that derived not only from the S&P 500 stock market but also from oil and gold markets. There is a consensus that there are strong interrelationships between Brent crude oil prices, the US dollar exchange rate, and US stock markets (Wen et al., 2018). They employed a VAR model and a multivariate Markov switching vector autoregressive (MS-VAR) model to look at US real stock prices (S&P 500) from 1979 to 2015.

Arouri et al. (2016) studied the impact of EPU on stock markets in the US over a long period encompassing 1900–2014 using both linear and market switching models. The study's results demonstrated that an increase in policy uncertainty had a significant negative impact on stock returns. However, the researchers also found that the relationship between economic policy uncertainty (EPU) and stock returns was not linear. The effect of EPU on stock returns was stronger and more persistent during periods of extreme market volatility. The negative link was seen not only in the US but also in Australia, Canada, China, Japan, and Korea (Christou et al., 2017). In the UK, Germany, and France, however, no relationship was found (Mei, 2018). Furthermore, Ahmad and Sharma (2018) investigated whether the output gap, combined with US economic uncertainty, could explain the differences in stock market return between the G7 and IBSA (India, Brazil, and South Africa) countries. They used VAR and revealed that EPU had a negative connection with stock market returns in all of the studied nations.

In a similar vein, Peng et al. (2018) used the quantile regression approach to investigate the relationship between EPU and stock market return in the G7 and BRIC countries. Except for France and the UK, they discovered new evidence to support the belief that EPU diminishes stock market returns. According to their findings, eight out of 10 stock markets showed asymmetric dependency with EPU. Furthermore, EPU did not affect the stock markets of France or the UK. Dakhlaoui and Aloui (2016) looked into the mechanisms of volatility spillovers from US EPU to BRIC stock markets. They discovered substantial evidence of a time-varying link between US EPU and stock market volatility using the GARCH family model. Furthermore, during times of global economic turmoil, the association was observed to be highly erratic. As a result, BRIC stock market participants kept a close eye on US economic policy developments.

Yang and Jiang (2016) investigated the impact of policy uncertainty on the Chinese stock market. Although the study found a statistically significant correlation between policy uncertainty and stock market returns, the results from the DCC-MGARCH model revealed that the dynamic correlation between these variables was relatively low. Additionally, the model indicated that the fluctuations in both policy uncertainty and stock market returns were largely driven by their previous values, which could be influenced by irrational investment behavior. Yu et al. (2018) used the generalised autoregressive conditional heteroscedasticity mixed data sampling (GARCH–MIDAS) model to analyze the impact of the monthly GEPU index on the daily Shanghai Composite Index. The empirical findings revealed that GEPU had a significant positive impact on the Chinese stock market's volatility, indicating gradual integration of the Chinese stock market into the global economy.

In addition to GEPU, the US EPU was found to have an impact on Chinese and US stock markets. Higher EPU led to considerable increases in market volatility, according to Liu and Zhang (2015), who found this relationship by using ARMA and the GARCH model. Wen et al. (2018) used univariate GARCH-based modeling with interaction terms to show that China's 2013 oil product pricing reform significantly reduced the risks of stock investments and financing. This finding implied that a market-oriented pricing mechanism could reduce the financial market uncertainty surrounding domestic oil product price adjustments. Das et al. (2019) investigated the effects of international (US-based) EPU, geopolitical risk (GPR), and financial stress (FS) on emerging stock markets. In comparison to the other two shock indicators (GPR and FS), the study found that EPU had the most severe and significant impact. Similarly, Su et al. (2019), who considered three different US uncertainty indices—EPU, financial uncertainty (FU), and news implied uncertainty (NVIX)—found that EPU had a positive association with the stock market volatility of industrialized countries, FU did not adequately predict long-term stock market volatility, and NVIX was the most accurate predictor of long-term stock market volatility.

RESEARCH METHODOLOGY

The study employed an econometric model that allows the regression coefficients and variance to be dependent on the current state, reflecting the dynamic nature of the relationship between government economic policy uncertainty (GEPU) and stock returns. This approach enabled the researchers to capture the nuanced effects of GEPU on stock returns. Markov Switching Model (Hamilton, 1989), often known as the regime-switching model, is one of the most widely used non-linear time series models. The study utilized a multi-equation model to characterize the time series behaviors across different regimes. This modeling approach, known as a Markov-Switching Model (MSM), allows for the capture of more complex dynamic patterns by enabling switching between the various model components. A unique feature of the MSM is that the switching mechanism is governed by an unobservable state variable that follows a first-order Markov chain process.

MSMs are commonly employed to investigate economic issues involving fundamental structural changes. The establishment of economic time series is characterized as a vector auto-regression (VAR) in the process of parameters that seems to be an output of the state of the Markov process (Hamilton, 1989). The VAR is a constant parameter that can be thought of as a simplified version of forward-looking rational expectations. The objective is to determine when shifts occur to estimate the parameters defined in different regimes and the rule of probability for the transition between regimes (Hamilton, 1990). The MSM is used as an alternative to linear models in all of the studies mentioned above since it allows for parameter changes in a stochastic process. Switches in volatility from a low level (contraction) to a high level (expansion) are recorded in a probabilistic technique by the stochastic process, as depicted by MSM (Equation 3.1):

$$P[a < y_t \leq b | y_1, y_2, \ldots, y_{t-1}] = P[a < y_t \leq b | y_{t-1}] \qquad \text{(Equation 3.1)}$$

This equation states that the probability distribution of the state at any time *t* depends only on the state at time *t − 1* and not on the states that were passed through at times *t − 2, t − 3*, … Hence, Markov processes are not path dependent. The model's strength lies in its flexibility, being capable of capturing changes in the variance between state processes and changes in the mean. The transition between regimes (states) by the first-order Markov process is then given by Equation 3.2:

$$Prob\{s_t = 1 | s_{t-1} = 1\} = p \quad Prob\{s_t = 0 | s_{t-1} = 1\} = 1 - p$$

$$Prob\{s_t = 0 | s_{t-1} = 0\} = q \quad Prob\{s_t = 1 | s_{t-1} = 0\} = 1 - q$$

(Equation 3.2)

where $s_t = 0$ or 1 depicts the unobserved state of the equation (Hamilton, 1989). The transition probability falls into the range of $0 \leq p_{ij} \leq 1$ and the sum of transition probabilities equals 1. More precisely, the auto-regressive model that Hamilton (1989) used in his study to analyze the GDP growth of the US can be generalized with the following equations (Dogan and Bilgili, 2014):

$$Y_t = \mu_{st} + \sum_{j=1}^{p} \phi_{jst-j}(Y_{t-j} - \mu_{st-j}) + \sigma_{st}\varepsilon_t \qquad \text{(Equation 3.3)}$$

$\Delta Y_t - \mu(st) = \phi_1(\Delta Y_{t-1} - \mu(s_{t-1}) +, \dots + \phi_p(\Delta Y_{t-p)} - \mu(s_{t-p}) + u_t$
(Equation 3.4)

Where μ_t is normally and independently distributed. The low-level $s_t = 0$ and high-level $s_t = 1$ regimes are related to different conditional distributions Δy_t and μ depending on the regimes (Krolzig, 2013).

Reboredo's (2012) baseline model was used in this investigation for this study. According to the study, the specification follows Hamilton's (1989) original model but permits the intercept term, slope coefficient, and variance in Equation 3.5 to be state-dependent. Several control variables must be addressed to determine the impacts of GEPU on stock market return. An additional control variable, oil price (OP) was included in this analysis (Hoque et al., 2019), resulting in the equation below.

$r_t = \alpha + \sum_{h=1}^{k} \beta_h r_{t-h}^{gepu} + \delta OP_t + \varepsilon_t$
(Equation 3.5)

This study followed the multivariate MSM dynamic regression model to explore the impacts of GEPU on stock return together with the added control variable, as follows:

$$r_t = \alpha s_t + \sum_{h=1}^{k} \beta {s_t}_h r_{t-h}^{gepu} + \delta OP_{st} + \varepsilon_t, \quad \varepsilon_t \approx i.i.d.N(0\sigma_{st}^2)$$

(Equation 3.6)

Where αs_t and σ_{st}^2 are the state-dependent intercept and variance in the stock return, respectively; while $\beta {s_t}_h$ measures the different impacts of the variables on the stock return in different states of the economy. The unobserved state variable s_t is a latent dummy variable equalling either 0 or 1. As in Maheu and McCurdy (2000) for simplicity's sake, only two possible states were assumed for the economy: bull and bear markets or low and high uncertainty in stock markets. The state variable was assumed to follow a first-order Markov chain with a transition probability matrix as follows:

$$P = p^{00}\ 1 - p^{11}\ 1 - p^{00}\ p^{11}$$

where: $p^{00} = P(S_t = 0 \lfloor S_{t-1} = 0)$

$p^{11} = P(S_t = 1 \lfloor S_{t-1} = 1)$

(Equation 3.7)

Initially, the study adopted the traditional approach of the Hamilton model, assuming that the transition probabilities remained constant over time. However, the researchers later relaxed this assumption by allowing the state transition probabilities to vary dynamically over time, influenced by predetermined variables. This modification enabled the examination of how these variables impacted the transition probabilities. The MSM (Equation 3.7) generated non-linearities in the mean and allowed for non-linearities invariance, given that volatility could change across different states of the economy. Non-linearities invariances were justified by the empirical autocorrelation in the squares of the residuals in Equation 3.5, found by the different tests performed in the previous section, given that MSM could lead to autocorrelation in the squares of a tied series as demonstrated in Equation 3.8.

The likelihood value for an observed value r_t in a given regime can be written as:

$$f(r_t | S_t = i, \Omega_{t-1;} \theta_i) = \frac{1}{\sqrt{2\pi\sigma_i}} exp\ exp \left[-\frac{1}{2} \left(\frac{r_t - \alpha_i - \sum_{h=1}^{k} \beta_{i,h} r_{t-h}^{GEPU} - \sum_{h=1}^{k} \beta_{i,h} r_{t-h}^{OIL}}{\sigma_i} \right)^2 \right]$$

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for $i = 0,1$

(Equation 3.8)

where $\theta_i = \{\alpha_i, \beta_{i,h}, \sigma_i\}$ and Ω_{t-1} is the information set available at time $t-1$. The conditional likelihood value for an individual observation can be written as a weighted average of the likelihood (Equation 3.8) using the state probabilities as weights:

$$g(r_t|\Omega_{t-1};\phi) = \sum_{t-0}^{1} f(r_t|S_t = i, \Omega_{t-1}; \theta_i) P(S_t = i|\Omega_{t-1};\phi)$$

(Equation 3.9)

where ϕ is the vector of the parameters entering the likelihood function of the data and $P(S_t = i|\Omega_{t-1};\phi)$ is the conditional probability of being in state i at time t given the information available at time $t-1$. From the total probability theorem, the conditional state probabilities and densities can be obtained recursively:

$$P(S_t = i|\Omega_{t-1};\phi) = \sum_{j=0}^{1} P(S_t = i|S_{t-1;} = j, \Omega_{t-1};\phi) \times P(S_{t-1} = j|\Omega_{t-1};\phi)$$
(Equation 3.10)

The updated regimen probabilities can be determined from the components of the conditional likelihood in Equation 3.28:

$$P(S_t = j|\Omega_t;\phi) = \frac{f(r_t|S_t=j,\Omega_{t-1};\theta_i)P(S_t=j|\Omega_{t-1};\phi)}{\sum_{i=0}^{1} f(r_t|S_t=i,\Omega_{t-1};\theta_i)P(S_t=i|\Omega_{t-1};\phi)} \quad \text{(Equation 3.11)}$$

Equations 3.10 and 3.11 can be iterated for a given initial value of the vector of the parameters to recursively derive the state probabilities and to obtain the parameters of the likelihood function:

$$log\ \ log\, L\,(r_1, r_2, \ldots, r_T;\phi) = \sum_{t=1}^{T \sum_t|\Omega_{t-1}} log \quad \text{(Equation 3.12)}$$

Robustness Check

The regression results were further subjected to robustness checks to evaluate their sensitivities. The wavelet coherence analysis model was used for research objectives. The model was chosen because it can effectively capture time-varying relationships in a non-linear manner by decomposing the relevant explanatory variables, specifically government economic policy uncertainty (GEPU), into their positive and negative components.

Wavelet Coherence Transform (WCT)

This study relied on the wavelet coherence transform (WCT), which is a mathematical technique that can decompose a signal into multiple lower-resolution levels by controlling the scaling and shifting factors of a single wavelet function (Torrence and Compo, 1998). WCT is a widely utilized method for analyzing linear interactions between signals. Built upon the Pearson correlation coefficient, commonly used in statistics, WCT adapts this concept for use in both frequency and time domains. It evaluates the consistency of the cross-spectral density between two signals by calculating the mean resultant vector's length. The squared value of this measure ranges from 0 to 1, providing a scale to quantify the strength of linear frequency correlations, with higher values indicating stronger correlations. In this study, WCT was used as a reference standard for comparison with other methods.

The Continuous Wavelet Transforms (CWT)

According to Sharif et al. (2020), the continuous wavelet transforms (CWT) *Na* (*p*, *q*) shows the projection of a wavelet ψ (.) in contrast to the time sequence $a(t) \in K^2$ ($\underline{R}$), that is:

$$N_a(p,q) = \int_{-\infty}^{\infty} a(t) \frac{1}{\sqrt{q}} \Psi\left(\frac{t-p}{M}\right) dt \quad \text{(Equation 3.13)}$$

An important feature of this technique is its ability to decompose consequently and seamlessly recreate a time series $a(t) \in K^2$ ($\underline{R}$):

$$a(t) = \frac{1}{c\Psi} \int_0^{\infty} \left[\int_{-\infty}^{\infty} N_a(p,q)_{\Psi_{p,q}}(t)du\right] \frac{dq}{M^2}, M > 0 \quad \text{(Equation 3.14)}$$

Moreover, this technique preserves the power of the observed time sequence:

$$\|a\|^2 = \frac{1}{c\Psi} \int_0^{\infty} \left[\int_{-\infty}^{\infty} |N_a(p,q)|^2 dp\right] \frac{dq}{M^2} \quad \text{(Equation 3.15)}$$

The wavelet formulation of coherence is between two signals, x, and y, and in the frequency w and time t domain. It is developed to explore the multiscale coherence and phase properties of time-varying non-stationary processes. First, the cross-wavelet power and continuous wavelet transform (CWT) is defined. Torrence and Compo (1998) stated that the cross-wavelet transform can be clarified by two-time sequences $a(t)$ and $b(t)$ as follows:

$$N_{ab}(p,q) = N_a(p,q) * N_b(p,q) \quad \text{(Equation 3.16)}$$

Where *Na(p, q)* and *Nb(p, q)* depict two continuous transforms of $a(t)$ and *b(t),* separately; *p* shows the location index, and *q* is the measure, whereas the composite conjugate is shown by (*). The cross-wavelet transform can be used to calculate wavelet power by | *Na (p, q)* |. The cross-wavelet power spectra separate the section in which strong energy concentration is revealed (cumulus of the restrained variance) in the domain related to time-frequency from the time series under consideration. The continuous wavelet transforms (CWT) can ascertain specific parts in the domain of time frequency where unexpected and major variations happen in the co-movement patterns of the time series being observed. The equation of the coefficient of adjusted wavelet coherence is as follows:

$$W^2(p,q) = \frac{\left|M\left(M^{-1}Nab(p,q)\right)\right|^2}{M(M^{-1}|Na(p,q)|^2)M(M^{-1}|Nb(p,q)|^2)} \quad \text{(Equation 3.17)}$$

Where *M* is the smoothing mechanism, and $0 \leq W^2(p,q) \leq 1$ shows the range of the squared wavelet coherence coefficient. A value close to 0 indicates the absence of a correlation, whereas a value close to unity indicates a high correlation. The Monte Carlo simulation method was used in this study to examine the hypothetical allocation of wavelet coherence.

All the indices represent the Islamic stocks in the countries such as Dow Jones Islamic Market (DJIM) Malaysia Titans 25 Index, Jakarta Islamic Index, S&P Saudi Arabia Shariah Index, Bahrain Islamic Index, FTSE Turkey Shariah Index, FTSE Pakistan Shariah Index, FTSE NASDAQ Dubai Kuwait 15 Shariah Index, FTSE NASDAQ Dubai UAE 20 Shariah Index, and FTSE NASDAQ Dubai Qatar 10 Shariah Index. In addition, the Dow Jones Islamic Market Index (DJIM), which was the first index created for investors seeking investments that comply with Muslim sharia law, serves as the benchmark.

A selection of Islamic stock indices was used to assess the effects of GEPU on various stock markets. Monthly data for the indices were included in this study. The first difference in logarithmic stock prices was used to calculate the stock return rate for each index. Monthly Islamic stock market return data were collected from September 2003 to September 2023 with a total of 240 monthly observations. The data for EPU were based on the monthly counts of global economic policy articles as a percentage of the total number of newspaper articles (Baker et al., 2013). The GEPU Index is a GDP-weighted average of national EPU indices for 21 countries: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the UK, and the US. All data were derived from DataStream.

FINDINGS AND DISCUSSION

Table 1.1 shows the summary results of GEPU Effects on selected Islamic stock returns. The impacts of GEPU were negative and significant in both low and high-volatility regimes in Turkey. This finding implied that an increase in GEPU would lower the stock returns in Turkey regardless of a high or a low volatility regime. The study's results align with those of Tiryaki and Tiryaki (2018), who examined the short-term and long-term macroeconomic factors influencing Turkish stock returns, considering both domestic and global economic policy uncertainty. They found that the effect of changes in domestic and global economic policy uncertainty on stock returns was negative. The findings of Bayar and Ceylan (2017) and Yu et al. (2018) also lend support to this study's findings.

Table 1.1 Summary Results of GEPU Effects on Islamic Stock Indices

No.	INDEX	Low volatility regime	High volatility regime	Oil Price
1	Dow Jones Islamic Market World Index	-0.0153	-0.1272***	12.3374***
		(0.0126)	(0.0309)	(2.1101)
2	Dow Jones Islamic Market Malaysia Titans 25 Index	0.0064	-0.0775**	8.3035***
		(0.0139)	(0.0328)	(2.4058)
3	Jakarta Islamic Index	-0.0229	-0.2366***	11.6492**
		(0.0238)	(0.0825)	(4.8961)
4	S&P Saudi Arabia Shariah Index	-0.0281	-0.0312	18.9727**
		(0.0259)	(0.0519)	(3.8222)
5	FTSE NASDAQ Dubai UAE 20 Index	-0.0299	-0.1223**	15.5852**
		(0.0227)	(0.0598)	(6.1592)
6	FTSE NASDAQ Dubai Kuwait 15 Shariah Index	0.0371*	-0.155	8.9283**
		(0.0226)	(0.1022)	(4.0677)
7	FTSE NASDAQ Dubai Qatar 10 Shariah Index	-0.0268	-0.1027	9.7648**
		(0.0224)	(0.0224)	(3.6417)
8	FTSE Turkey Shariah Index	-0.1496***	-0.0727*	24.7685***
		(0.0258)	(0.0415)	(3.1144)
9	Bahrain Islamic Index	0.0692***	-0.0162	16.7541***
		(0.0001)	(0.0406)	(0.0199)
10	FTSE Pakistan Shariah Index	-0.0218	-0.5117**	6.6352
		(0.0276)	(0.2257)	(4.8919)

Note. *, **, and *** indicate significance levels of 10%, 5%, and 1%, respectively.

However, Brogaard and Detzel (2015) found that higher EPU led to lower contemporaneous stock returns but higher future returns indicating that external demand and supply shocks affected the domestic stock market in Turkey. As the theory suggests, increases in GEPU could have negative spillover effects in emerging economies by reducing investors' willingness to take risks thus resulting in a decrease in the overall size of capital flows to emerging markets to stay safe at home. The findings suggest that the economy's reliance on trade and financial capital may amplify the negative effects observed. Mitigating these adverse impacts may necessitate policies aimed at reducing economic dependencies, which could be a long-term process. This underscores the importance of implementing policies that address the underlying structural vulnerabilities of the economy.

These results also showed that the effects of GEPU varied across regime states with the negative effects of GEPU dominating the positive effects. GEPU had a significant negative effect on the low volatility regime in Turkey. In the case of Kuwait and Bahrain, GEPU had a significant positive effect on stock returns in the low volatility regime, implying that changes in GEPU would result in higher returns in these stock markets. The results are consistent with Chiang (2019) who investigated EPU, risk, and stock returns in the G7 countries and found that lagged EPU innovations had a positive effect in predicting conditional variance.

In the high volatility regime, GEPU had significant negative effects on Islamic stock market returns in DJIM, Malaysia, Indonesia, UAE, Turkey, and Pakistan. Thus, an increase in GEPU would reduce all the Islamic stock market returns in the high volatility regime. A highly volatile stock is inherently riskier; when investing in a volatile security, the chance for success increases as much as the risk of failure. Except for Pakistan, oil price had a substantial effect as a control variable in this study. Oil price changes significantly affected stock market returns positively. An increase in the oil price increased the Islamic stock returns. In a similar vein, Abdullah (2020) found that rising oil prices generated stock market returns in Saudi Arabia, Kuwait, and the UAE. According to the study, US EPU had a statistically small impact on stock market performance in countries such as Qatar, the UAE, Kuwait, and Saudi Arabia. On the contrary, results from this study demonstrated that GEPU had an impact on stock market returns in the UAE and Kuwait but not in the case of Qatar and Saudi Arabia.

The findings of this study slightly differ from Aziz et al. (2020) who investigated the volatility spillovers from GEPU and macroeconomic factors to the Islamic stock markets in Indonesia, Malaysia, and Turkey. The researchers discovered that government economic policy uncertainty (GEPU) had a statistically significant impact only on the returns of the Turkish Islamic Stock Index. This disparity might be attributed to variations in the sample period, sample size, and methodology employed across the different studies. Used. Thus, it can be summarized that based on this study, GEPU had significant effects on Islamic stock market returns with a majority of them experiencing negative effects except for two stock markets, namely Qatar and Saudi Arabia.

Table 1.2 Results of Markov Switching Regression's Time Varying Probabilities and Expected Duration of Low and High Volatility Regimes for Islamic Stock Market Returns

No.	INDEX	Time-varying transition probability				Expected Duration	
		Low/ Low	Low/ High	High/L ow	High/High	Low volatility regime	High volatility regime
1	Dow Jones Islamic Market World Index	0.953	0.047	0.112	0.888	21	9***
2	Dow Jones Islamic Market Malaysia Titans 25 Index	0.842	0.158	0.194	0.806	6	5**
3	Jakarta SE Composite Index	0.933	0.066	0.025	0.975	15**	40
4	S&P Saudi Arabia Shariah Index	0.979	0.021	0.042	0.957	48	23
5	FTSE NASDAQ Dubai UAE 20 Index	0.904	0.096	0.067	0.932	10	15**
6	FTSE NASDAQ Dubai Kuwait 15 Shariah Index	0.955	0.045	0.357	0.642	22*	3
7	FTSE NASDAQ Dubai	0.944	0.056	0.143	0.857	18	7

	Qatar 10 Shariah Index						
8	FTSE Turkey Shariah Index	0.757	0.243	0.043	0.957	4***	24*
9	Bahrain Islamic Index	0.001	0.998	0.085	0.915	1***	12
10	FTSE Pakistan Shariah Index	0.548	0.452	0.099	0.901	2**	10

Note. ***, ***, and * denote 1%, 5%, and 10% significance levels. The expected duration is in months.

Table 1.2 summarizes the time-varying transition probabilities and the expected durations of high and low volatility regimes for stock market returns. In the low volatility regime, the probability of DJIM being in the same state was 0.953. In other words, once DJIM was in a low volatility regime, it tended to stay there for approximately 21 months, which was longer than in the high volatility regime. However, there was a probability of 0.047 that it would transit to a high volatility regime. The high volatility regime was not as persistent. For the Dow Jones Islamic Market Index (DJIM), there was a 0.112 probability of transitioning from high to low volatility and a 0.88 probability of staying in high volatility for about 9 months. In Malaysia, the transition probabilities were higher for reverting to the same volatility regime, with expected durations in low and high-volatility regimes likely to be balanced. Meanwhile, the transition probabilities for the Jakarta Islamic Index were likely to be the same but with a longer period in the high volatility regime.

For S&P Saudi Arabia Shariah Index, the probability of transiting from a low-to-low volatility regime was 0.979, and it would stay in that regime for a long time of about 48 months. The probability of it transiting to a high volatility regime was only 0.021. It had a high probability of 0.957 to stay in a high volatility regime for 23 months. For the FTSE NASDAQ Dubai Kuwait 15 Shariah Index, the probability of transiting from a high to low volatility regime was 0.357, which was the highest compared to all other indices, and it would stay in a high volatility regime for about 3 months. FTSE NASDAQ Dubai UAE 20 Index was similar to the Jakarta Islamic Index where the expected duration of its staying in a higher volatility regime was longer at 15 months compared to 10 months in a low volatility regime.

For the FTSE NASDAQ Dubai Qatar 10 Shariah Index, the transition probability of staying in a low volatility regime was 0.944. The probability of it transiting to a high volatility regime was only 0.056, and it would stay in a low volatility regime for about 18 months, which was longer than the 7-month duration in the high volatility regime (). FTSE Turkey Shariah Index's time-varying transition probability was higher for states in a high volatility regime (0.957), and it also had a longer expected duration of staying in that regime (24 months) compared with only about 4 months in a low volatility regime. Bahrain Islamic Index was the only index that had a high transition probability from low to high volatility regime. It also had a shorter expected duration of about 1 month in the low volatility regime, and it would stay longer in the high volatility regime), which was for about 12 months. This expected duration was similar to the FTSE Pakistan Shariah Index, but the Pakistani index's transition probabilities were lower in the low volatility regime (0.548) and from the low to high volatility regime (0.452). The probability was higher in a high-volatility regime and the expected duration to be in that high-volatility regime was about 10 months.

Robustness Test

This study relied on wavelet transformation, which is a mathematical technique that can decompose a signal into multiple lower-resolution levels by controlling the scaling and shifting factors of a single wavelet function (Torrence & Compo, 1998). Wavelet coherence is a widely employed technique for analyzing linear interactions between signals. Built upon the Pearson correlation coefficient, commonly used in statistics, wavelet coherence adapts this concept for use in both frequency and time domains. It evaluates the consistency of the cross-spectral density between two signals by calculating the mean resultant vector's length. The squared value of this measure ranges from 0 to 1, providing a scale to quantify the strength of linear frequency correlations. In this study,

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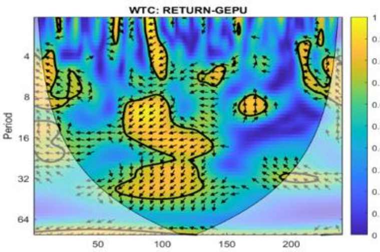
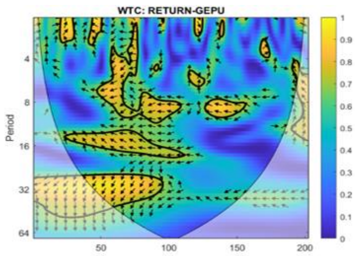
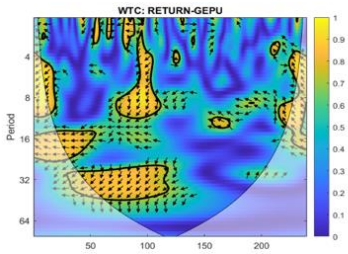
wavelet coherence served as a reference standard for comparing the performance of other methods.



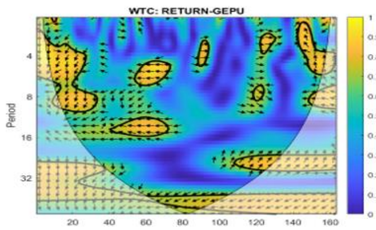
DJIM



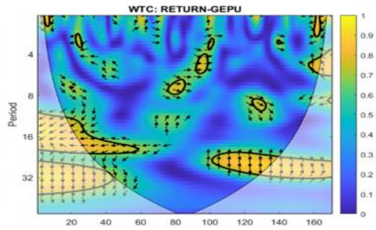
DJIM Malaysia Titans 25 Index



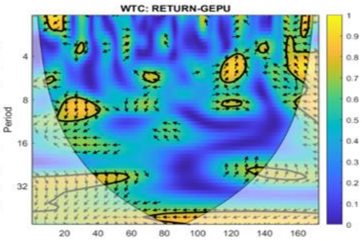
Jakarta Islamic Index



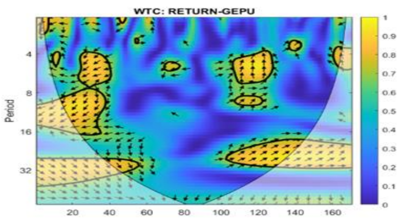
S&P Saudi Arabia Shariah Index



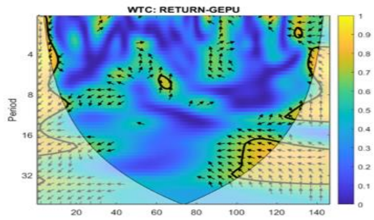
FTSE NASDAQ Dubai Kuwait 15 Shariah Index



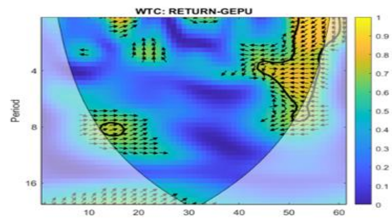
FTSE NASDAQ Dubai UAE 20 Index



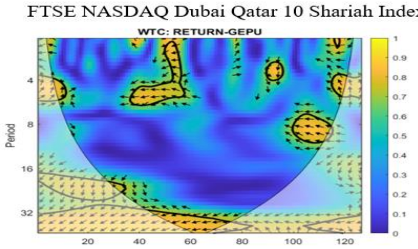
FTSE NASDAQ Dubai Qatar 10 Shariah Index



FTSE Turkey Shariah Index



Bahrain Islamic Index



FTSE Pakistan Shariah Index

Figure 1.1 presents the wavelet squared coherency and wavelet phase difference between changes in Islamic stock market returns and government economic policy uncertainty (GEPU). The wavelet coherence is visualized using contour plots, which capture three dimensions: frequency, time, and wavelet coherence power. The frequency and time axes are displayed vertically and horizontally, respectively. To facilitate interpretation, the frequency is converted into time units, ranging from short-term (0–4 years) to very long-term (16–32 years) at the bottom of the plot. The wavelet coherence is depicted using a color scale, ranging from blue (low power) to gold-yellow (high power). The gold-yellow color indicates a high degree of common power between the two series. The wavelet coherence plots identify regions in time-frequency space where the two-time series co-vary. These regions are marked by warmer colors (yellow), indicating significant interrelation between the series, and colder colors (blue), signifying lower dependence. Regions beyond the significant areas represent time and frequencies with no dependence on the series.

The wavelet coherence plots also display arrows that represent the lead-lag phase relations between the examined series. A zero-phase difference indicates that the two series move together on a particular scale. Arrows pointing to the right (left) signify that the series is in phase (anti-phase). When in phase, the series move in the same direction, and anti-phase indicates they move in opposite directions. The direction of the arrows provides additional information: arrows pointing to the right-down or left-up indicate that the first variable leads, while arrows pointing to the right-up or left-down show that the second variable leads. For DJIM stock return GEPU, the results are in line with the MSM results where the two variables had significant negative relationships in all yellow islands in the cone of influence. The arrows pointed to the left indicating that the time series were in anti-phase, i.e., moving in opposite directions. The arrows pointing to the left-down revealed that the second variable, i.e., stock return, was the leading variable at this stage. The biggest yellow island revealed high volatility and strong dependency in medium (8–16) and long-term (16–32) periods, specifically in 2007. Referring to the 2007–2009 global financial crisis, both conventional and Islamic indices were adversely affected during that period (Arshad and Rizvi, 2013).

Malaysia's stock return also had a significant negative relationship with GEPU. The results are consistent with the findings in MSM. The arrow represented the interrelationship between the two variables and pointed to the left indicating that the two series were in anti-phase. The time series were in opposite directions in all the yellow islands. Strong inter-dependency can be seen from the beginning of 2002 until 2010 in all sample periods followed by low dependency until 2019. However, in the medium term, the arrow pointed to the left-up indicating that GEPU was the leading variable. The big yellow region in the long term mirrored similar circumstances as in DJIM where it was probably associated with the 2007–2009 global financial crisis.

In the case of Indonesia, the variables had a significant negative relationship in the cone of influence from 2000 until 2010. Arrows pointed to the left down indicating that the second variable, i.e., stock return, was leading at this stage. MSM results for Saudi Arabia and Qatar revealed that GEPU was not significantly linked to stock return. This is consistent with the result in the wavelet that revealed the small island with various directions of the arrows even though there was a small yellow region in short and medium periods. In 2007, a significant correlation was observed between the variables in the short-term frequency band (0–8), indicating a strong interrelation between the two series during this period. This was also associated with the impact of the 2007–2009 global financial crisis that affected the whole world. A similar impact was found for Qatar, where the duration of the impact of GEPU on the stock market occurred for a longer period of up to 16 months. Arrows pointing to the left-down revealed that the second variable was leading. However, the arrow pointed to the right-up in 2014–2016, indicating a positive interrelation between the two variables, and the second variable, i.e., stock return, was leading. Both countries exhibited inconsistent relationships thus supporting the result of MSM that showed insignificant relationships for both countries.

For Kuwait, a statistically significant positive relationship was observed in the low volatility regime, with a prolonged duration of approximately 22 months. This is consistent with the wavelet result depicted by the yellow island for 16–32 months in 2015. This arrow can be seen pointing to the right side. However, for the year 2019, the arrow pointed to the left indicating a negative interrelation. Similarly for the UAE, there was a significant negative relationship in the high volatility regime with an expected duration of 15 months, which occurred in 2008. It might also be related to the global financial crisis at that time. In 2016, a small yellow region with an arrow pointing to the right-up in the short term indicated that the first variable, namely GEPU, was leading.

For Turkey, Bahrain, and Pakistan, the results revealed significant negative relationships in the short term in the low volatility regime. These results are consistent with MSM, but the quantum for Bahrain was much larger with a positive relationship in 2017–2020. Bahrain’s economy is dominated by oil and natural gas. Despite its diverse economy, Bahrain has been under strain in recent years as a result of the reduction in oil prices from 2014 to 2015. The decreasing hydrocarbon prices have also continued to harm Bahrain’s economy. Since 2009, Bahrain’s fiscal policy has been expansionary, resulting in general government deficits. However, in 2016, the situation deteriorated further with the markets operating in difficult economic conditions. After a year of declining stock prices, the apparent stabilization of global oil prices in 2016 resulted in a comparable firming of the main index and some increasingly favorable valuations.

In sum, the results of wavelet analysis are consistent with the MSM results. The wavelet coherence analysis showed that co-movements depend on both frequency and time and are strongly affected by the occurrence of a financial crisis. The wavelet coherence analysis revealed significant changes in the pattern of co-movements among the selected variables, particularly after 2005 and 2008. For some indices such as DJIM, Malaysia, and Jakarta, the interrelation between stock return and GEPU was high before the year 2012 at all periods which can be viewed as a higher degree of persistent shock transmissions during turbulent periods. Kuwait and UAE seemed to exhibit a similar pattern where the strong interdependency with GEPU can be identified in the long-term period of 16–32 months before the year 2011 and within 0–8 months after the year 2014. Saudi Arabia and Qatar wavelet results are slightly different from the MSM results where different directions of the arrows could be identified before the year 2012 and after 2015.

Based on the results, GEPU had significant influences on eight out of 10 selected Islamic stock market returns, with the majority of them being negative. However, GEPU had a positive effect on the Bahrain index. These findings imply that the effects of GEPU on Islamic stock returns vary depending on time and regime.

A negative effect is expected under a low volatility regime, such as the Malaysian stock market. In a low-volatility environment, the majority of risk-averse investors are present in the market, waiting to see how the GEPU will impact the Islamic market. As a result, the GEPU's detrimental impact on this market may be seen. Based on the summary results for the probabilities of transiting, the likelihood of being in the low-volatility regime and remaining in that regime was higher than the probability of being in the high-volatility regime and remaining in that regime. In the majority of the circumstances, the transition probabilities from a low to a high regime and from a high to a low regime were lower than the probabilities of remaining in the low regime or the high regime.

The GEPU had a stronger impact on stock returns during periods of high volatility, showing that economic fundamentals and external forces are the primary influences on switching stock returns with transition variables. Additionally, the government economic policy uncertainty (GEPU) had a negative impact on returns in both regimes, indicating risk aversion to GEPU risk, regardless of market or volatility conditions. To the best of the researcher's knowledge, only a few studies have looked into the link between GEPU and Islamic stock markets. The Islamic stock indices of emerging economies such as Indonesia, Malaysia, and Turkey were the focus of Aziz et al. (2020). The findings revealed that GEPU had a considerable impact on the performance of the Turkish Islamic Stock Index alone. Yu et al. (2021) found that GEPU had a statistically significant impact on stock volatility in nine emerging economies. Uncertainty over global economic policy was found to have a detrimental impact on the Malaysian stock market as a whole (Hoque et al., 2019).

CONCLUSIONS

In summary, this study has delved into the intricate relationship between global economic policy uncertainty and selected Islamic stock market returns. A comprehensive examination of the effects of economic policy uncertainty on financial markets, with a specific focus on Islamic stock markets, has yielded several significant findings.

Firstly, it is evident that global economic policy uncertainty serves as a significant determinant of market behavior, influencing investor sentiment, asset pricing, and overall market volatility. The fluctuating landscape of economic policies, coupled with geopolitical tensions and macroeconomic dynamics, creates an environment of uncertainty that investors must navigate.

Secondly, our study has highlighted the nuanced response of Islamic stock markets to global economic policy uncertainty. While Islamic finance principles prioritize stability, transparency, and ethical conduct, Islamic stock markets are not immune to the effects of economic uncertainty. Changes in economic policies, both domestic and international, can impact Sharia-compliant investments and contribute to fluctuations in Islamic stock market returns.

Furthermore, our analysis underscores the importance of understanding the specific drivers and mechanisms through which economic policy uncertainty influences Islamic stock market returns. Factors such as Sharia compliance criteria, investor behavior, and macroeconomic conditions play pivotal roles in shaping the response of Islamic stock markets to economic uncertainty.

In conclusion, this research contributes to the existing literature by providing empirical evidence on the impact of global economic policy uncertainty on selected Islamic stock market returns. The findings offer valuable insights for investors, policymakers, and market participants seeking to navigate the complexities of Islamic finance within an environment of economic uncertainty. Moving forward, continued research in this area is essential to deepen our understanding of the dynamics between economic policy uncertainty and Islamic stock market returns, ultimately informing more robust investment strategies and policy decisions in the realm of Islamic finance.

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