The current issue and full text archive of this journal is available on Emerald Insight at:
https://www.emerald.com/insight/2077-1886.htm

Economic policy uncertainty of China and investment opportunities: a tale of ASEAN stock markets

Received 15 April 2021
Revised 13 July 2021
Accepted 10 September 2021

Hassanudin Mohd Thas Thaker
Faculty of Business and Management, UCSI University, Kuala Lumpur, Malaysia and Sunway University, Subang Jaya, Malaysia
Mohamed Asmy Mohd Thas Thaker
Kulliyyah of Economics and Management Sciences, International Islamic University Malaysia (IIUM), Subang Jaya, Malaysia
Muhammad Rizky Prima Sakti
University College Bahrain (UCB), Manama, Bahrain
Imtiaz Sifat
Institute for Management Research, Radboud University, Nijmegen, The Netherlands
Anwar Allah Pitchay
School of Management, Universiti Sains Malaysia, Gelugor, Malaysia, and
Hafezali Iqbal Hussain
Taylor's University, Subang Jayax, Malaysia and University of Economics and Human Sciences, Warsaw, Poland

Abstract

Purpose – The purpose of this paper is to examine the effect of economic policy uncertainty (EPU) of China on investment opportunities in five ASEAN economies.

Design/methodology/approach – This paper employs advanced empirical approaches, such as Multivariate DCC-GARCH and Continuous Wavelet Transform (CWT) to test the research objective. The period of analysis involved monthly data from 2003 until 2019.

Findings – This paper provides evidence where the Malaysian stock market to be the least exposed to risks emanating from Chinese EPU, followed by Singapore, the Philippines, Thailand and Indonesia. Results for investment opportunities based on time horizon suggest, for a short-term holding period, investors are better off investing in Singapore and Indonesia, while, for medium-term holding periods, all ASEAN markets appear lucrative except for the Philippines.

JEL Classification — E0, E2, E5, F1

© Hassanudin Mohd Thas Thaker, Mohamed Asmy Mohd Thas Thaker, Muhammad Rizky Prima Sakti, Imtiaz Sifat, Anwar Allah Pitchay and Hafezali Iqbal Hussain. Published in *Journal of Economics, Finance and Administrative Science*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence maybe seen at http://creativecommons.org/licences/by/4.0/legalcode

This research is funded by the Fundamental Research Grant Scheme 2020 (FRGS/1/2020/SS01/SYUC/02/4), Ministry of Higher Education Malaysia.

Journal of Economics, Finance and Administrative Science
Vol. 27 No. 54, 2022
pp. 277-293
Emerald Publishing Limited
e-ISSN: 2218-0648
p-ISSN: 2077-1886
DOI 10.1108/JEFAS-04-2021-0032

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

Practical implications – From a managerial perspective, the outcome or findings of this study are expected to aid the retail and institutional investors in designing better strategies on diversifying a stock portfolio with different holding periods.

Originality/value – Theoretically, the findings of this study contribute fresh insights into an emerging strand of literature focusing on the transmission of regional policy. Methodologically as well, this study is a novel venture to the best of authors' knowledge.

Keywords Economic policy uncertainty, Investment, ASEAN markets, Stock markets, GARCH, Wavelet

Paper type Research paper

1. Introduction

Among the myriad factors influencing investment opportunities, economic policy ranks high in importance in both normal and abnormal economic climates. Nearly every major economic event has considerable direct or indirect implications for stock market movements. Chiefs among the economic events are those tied to economic policy driven by actions taken by the central bank which formulates monetary policy, decides on the short-term interest rate and manages the money supply. The changes in these institutions' policies have a well-known spillover effect on financial markets, which are usually quick to adapt to the changing states of the economy as well as sentiment signals by policy authorities. Baker *et al.* (2013) premise that economic policymakers may aggravate the volatility of monetary, fiscal, or regulatory policy and this volatility is termed economic policy uncertainty (EPU). The agency cost between the policymakers and investors arises due to the stringent bureaucratic process which becomes one of the constraints that leave investors uncertain about the current economic policies and their involvement in the economy.

From the perspective of capital market theory, the main objective is to allocate efficiently scarce resources among competing for investment alternatives. This allocation decision depends primarily on the operational and informational efficiency of the market (Levine and Zervos, 1998; and Caporale *et al.*, 2004). Furthermore, when information asymmetry abounds in a market, it leads to an increase in the risk of the stock market; subsequently leading to higher transaction costs which later can engender adverse selection. The implication of such a higher transaction costs is the dissuasion of investors from participating in the price discovery process, which, in turn, impedes market efficiency. As a result, intelligent investors are likely to perceive such situations as inopportune or too risky to invest or trade. The same holds in the context of immediate change in economic policy or fickle political environments. For instance, when federal banks or central banks freeze the quantity of money supply, liquidity shrinks, perturbing investor confidence. The impact would be in the form of higher borrowing costs and diminished investment activity by investors because there are pessimistic about investment performance (Brunnermeier and Pederson, 2009). This may lead to the withdrawal of investment activity by investors due to the prevailing uncertainty in the market.

Given the significant rise of China in economic and financial importance around the world and its hegemony in the South-East Asian region, the effects of Chinese EPU on the ASEAN stock market movement are merited. We expound on this rationale further in several steps. Firstly, it is noticeable that China's economic activity is considered one of the fastest growing in the world. Trade-wise, most economies in the world have a relationship with China, no matter how unilateral in nature. This attracts significant attention from investors and academia. Thus, further exploration of if China changes its economic policy, what will happen to its counterparts in terms of investment and stock market movement would be an interesting field to study. Secondly, we choose EPU of China because of the strong economic integration with other ASEAN countries. For example, in 2018, the volume of transactions in the monetary unit between China and ASEAN countries recorded a total of $587.87 billion, which is 14% higher compared to 2017. Furthermore, the continuous investment by China in ASEAN countries totaled about $205.71 billion. Aside from the apparent contingency of Chinese policy decisions spilling over to financial markets, investors are to remain ever vigilant of the fact that China is still a country that is transitioning

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

from a centrally planned economic system to a market-based system. Compounded by the political necessities of the Chinese Communist Party to perpetuate the *status quo,* the Chinese authorities often need to improvise in enacting economic policies and have been known to take unorthodox decisions. Thus, this combination of potentially volatile and heterodox policy imperatives of the Chinese authorities, makes China's EPU an interesting phenomenon worthy of study. Unfortunately, empirical focus on this matter is relatively scarce until this date.

In this study, we specifically investigate the relationship between the level of EPU in China vis-à-vis five ASEAN countries; Malaysia, Singapore, the Philippines, Thailand and Indonesia. Our objective is to understand the spillover of policy uncertainty into the above five markets when there is a change in the EPU of China. This work builds upon the previous work of Li *et al.* (2019), where the authors look at the consequence of China's EPU on G7 countries' market volatility. The authors concluded that the EPU of China has a significant relationship with the market volatility of G7 countries. The same hypothesis has been tested with similar results by Liu and Zhang (2015), Duan *et al.* (2018) and Ma *et al.* (2018). However, the EPU-Market nexus has received very little attention from emerging markets, particularly in the ASEAN region.

We claim three novelty contributions in this paper. Firstly, this study is expected to enrich the existing literature in the field of EPU and stock market activity. Given the limited literature available in the context of ASEAN, as most of the literature is western flavored where the focus is more toward EPU of the US and spillovers effects toward other countries, we believe, the findings from this study are expected to enrich existing literature available in this area of research. To the best knowledge of the authors, this study is expected to be the first-ever study looking at this area of research by analyzing the EPU of China with emerging ASEAN markets. Most of the existing literature neglected the investment side when there is a change in EPU of China; instead, they focus on the impacts on the market and the economy in general. We fill this gap by using the concept of investment opportunities (covering different time horizons) available to investors when the EPU of China changes. Secondly, the outcomes of this study hope to help in designing better policies for monitoring, promoting and stabilizing ASEAN stock markets globally whenever EPU of China. Finally, the use of multi-resolution analysis in the time-frequency domain via Wavelets yields the results previously undocumented in the literature.

The remainder of this paper is organized as follows. Section 2 explores the literature available in the context of the research area. Section 3 describes the methodological part and Section 4 presents the findings and explains the results. Finally, we offer concluding remarks.

2. Literature review

2.1 Theoretical foundation

The efficient market hypothesis (EMH) consists of three main forms: (1) weak-form efficiency, (2) semi-strong form efficiency and (3) strong-form efficiency (Malkiel and Fama, 1970). According to weak-form efficiency, historical information does not play an important role in influencing the stock price and does not have an association with future prices. Thus, any supplementary information is incapable of predicting future stock prices under weak-form efficiency. This form of efficiency clashes with the EPU of China since most of the information available or taken into consideration in calculating the EPU are historical and current. The next category is called semi-strong form efficiency, where this efficiency highlights that all new publicly available information is reflected in the share prices. If this is the case, using the EPU of China to search for good investment may not be good enough to decide on investment as the EPU can occur anytime and is unpredictable. Lastly, under strong-form efficiency, both private and publicly available information is reflected in the stock prices. In informationally efficient markets, the EPU of China no longer assumes the role as important information intermediary since every single piece of information relevant to investors is already incorporated in the stock price. Given this phenomenon, the question

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

of whether the EPU of China contains valuable information relevant to the market remains ambiguous and deserves a closer look.

2.2 Prior literature

Since the global economy is interconnected, a negative or positive shock on the economy can be transmitted to other countries directly or indirectly through the channels of financial market connections (Forbes and Chin, 2004). Indeed, its effect can be strong and significant when the diffusion originates from one of the world's leading economies (Sum, 2012). Several intensive pieces of research have been carried out to examine the effect of EPU and stock market return or volatility (Boako and Alagidede, 2018; Beirne *et al.*, 2010). Some studies have focused on how EPU within the country affects the country's stock markets while others have focused on the effect of EPU in one country on the stock market returns.

Becker and Peters (1998) found that the news and information originating from the US were responsible for the existence of spillovers between the US and UK stock markets. It was later confirmed by Ehrmann and Fratzscher in 2005, who argued that news releases would have an impact on markets; however, the impact of spillovers was strong especially in the US because of economic integration then followed by the Eurozone. Besides, Sum (2012) examined the implications of US EPU on their stock market return, and they found that stock market excess returns have responded negatively to the increased changes in EPU. Another study conducted on the European stock market by Sum (2012) analyzed the impact of EPU in Europe on other Eurozone countries' stock market returns and the results showed that there was a negative impact of EPU on all Eurozone countries except Croatia, Bulgaria, Malta, Slovakia, Lithuania, Estonia, Latvia and Slovenia. In a related study, Ehrmann and Fratzsher (2006) examined the influence of tightening monetary policy in the United States on stock markets around the world. Their study found evidence of the integration of global markets with the US. Thus, stock market returns negatively respond to tightening monetary policy in the United States. Miao and Zhi-Qiang (2016) investigate the dynamic correlation of EPU of the China on the Shanghai Composite Index. The authors found that Shanghai Composite Index is highly correlated with the EPU of China, where the EPU harms the Shanghai index for the eight-month duration while the stock market uncertainty itself contributes to a negative impact on the economic uncertainty in the country for four months.

Ngo (2019) investigated the daily returns and volatility spillover effects in common stock prices between China and four Southeast Asian countries (Vietnam, Thailand, Singapore, and Malaysia). The study employs vector autoregression analysis with a bivariate GARCH-BEKK model to capture return linkage and volatility transmission over the pre-and post-2008 Global Financial Crisis periods. The main empirical finding is that the volatility of the Chinese market has had a significant impact on the other markets in the sample. The linkage between China and other markets appears to be remarkable in terms of stock return during and after the Global Financial Crisis. Notably, the findings also suggest that the stock markets are more deeply entwined with the crisis.

Tarek E. *et al.* (2020) use quarterly data on non-financial firms listed in the DJIA30 and NASDAQ100 for the period 1999–2016 to examine the effect of both inflation and interest rates on stock prices. The panel Johansen co-integration analysis results show that there is co-integration between stock prices, changes in stock prices due to inflation rates and changes in stock prices due to real interest rates. Co-integration regression results show that inflation rates are negatively associated with stock prices, while real interest rates and stock prices are positively associated. Changes in real interest rates and inflation rates are also positively associated. Granger causes significant changes in stock prices, a significant speed of adjustment to long-run equilibrium between observed stock prices and real interest rates, and a significant speed of adjustment to long-run equilibrium between changes in stock prices caused by real interest rates and changes in inflation rates.

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

Caporale *et al.*, 2022 examine stock market integration between the five ASEAN countries and, in turn, the United States and China from November 2002 to August 2020. The following are the key findings. Long-term dependence exists in all stock indices. Co-integration exists between the five ASEAN countries and the US, but almost none exists between the former and China, except for Indonesia and China in the financial sector. The global financial crisis of 2007–2008, as well as the Chinese stock market crash in 2015, weakened ties between the ASEAN five and both China and the United States. These findings are discussed in terms of their implications for market participants and policymakers.

Jan and van Vuuren (2021) investigated a portfolio of liquid global stocks and bonds, intending to limit absolute risk to that of a standardized benchmark, and determine whether this has a significant impact on expected return in both high volatility (HV) and low volatility periods (LV). The results show that replicating benchmark portfolio risk during HV produces portfolios that outperform both the maximum return (MR) portfolio and the benchmark. MR portfolios outperform LV portfolios with the same risk as to the benchmark. The MR portfolio weights assets in order to maximize the return on the tracking error (TE) frontier. Because of an inefficient benchmark, the benchmark replicated risk portfolio had a higher absolute risk value than the MR portfolio during HV. In HV, the benchmark replicated risk portfolio favored treasury bills with intermediate maturities.

Although intensive research has been carried out on determining its relationship, relatively little attention has been paid to the relationship between China's EPU and the ASEAN stock markets. This gap is particularly important since the former is now the largest trading partner of the ASEAN market nowadays. Thus, the present study aims to fill up this gap by analyzing the impact of EPU of China on ASEAN stock markets and we also will present a result of which market will be appropriate for the investors to make a wise investment decision when it comes to ASEAN markets. This dimension of research seems to be lacking in the existing literature.

3. Method

3.1 Data collection

We use monthly time series data from January 2003 until April 2019. The data of the EPU of China were collected from (http://www.policyuncertainty.com/index.html) and for ASEAN stock indexes data, we collected information from the following website (https://www.investing.com/). According to Wu *et al.* (2016), the EPU is defined as uncertainties existing due to economic policymakers' decisions. To measure the degree of China's EPU, we use the news-based index in Baker *et al.* (2013) and Baker *et al.* (2016). The index was designed based on a scaled frequency count of news articles related to China's economic and financial matters such as monetary, taxation, regulatory, political issue, economic reformation and fiscal. The news is divided into three categories such as uncertainty, economics and policy. The reason why we use the monthly data is that the EPU of China is only available on a monthly period instead of a daily basis. To make it consistent with the EPU data, we collect using the same monthly frequency for ASEAN stock markets. Our data captures the divergence in volatilities and correlations of EPU of China with ASEAN markets in pre (before the year 2008) and post-global (after the year 2008). By incorporating this effect (financial crisis), we believe, the results will be more meaningful to explain the behavior of stock markets given the changes in China's EPU during the crisis period. To compute the return of ASEAN indexes, we use the log return of monthly price for each index $\{(\ln(Pt)/\ln(Pt-1)\}$, where P is referring to the price index. Table 1 shows the details of the indexes used.

3.2 Empirical estimation using the MGARCH-DCC

The multivariate generalized autoregressive conditional heteroscedasticity (MGARCH) model is used to analyze the correlation dynamics of the volatilities and co-volatilities of

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

several stock indexes, which answers the following questions: (a) does the volatility of EPU of China lead to the volatility of ASEAN stock markets? (b) Does the volatility of the EPU of China transmit to ASEAN stock markets directly through its conditional variance or indirectly through its conditional covariance? This model is framed by Engle and Kevin (2001) and Engle (2002), and later advanced the model introduced by Bollerslev (1990) called constant conditional correlation (CCC-GARCH). The DCC multivariate-GARCH is a revised version of CCC-GARCH. The DCC model eliminates some of the unmeasurable assumptions in many quantitative types of investigation. According to Engle (2002), the equation for conditional covariance using a multivariate matrix (H_t) is written as below:

$$H_t = D_t R_t D_t$$

where D_t = represent matrix (diagonal) of conditional time differences, (ϵ_t) is represent standardized residual which obtained from the univariate GARCH model (evidenced in on diagonal rudiments and R_t shows the correlation matrix based on time differences. The log-likelihood of the above estimator can be written as follow:

$$L = -\frac{1}{2}\sum_{t=1}^{T}\left(k\log(2\pi) + 2\log|H_t| + r_t H_t^{-1} r_t\right)$$

$$= -\frac{1}{2}\sum_{t=1}^{T}(k\log(2\pi) + 2\log|D_t R_t D_t| + r_t D_t^{-1} R_t^{-1} D_t^{-1} r_t$$

$$= -\frac{1}{2}\sum_{t=1}^{T}(k\log(2\pi) + 2\log|D_t| + \log(|R_t| + \epsilon_t R_t^{-1}\epsilon_t)$$

where, $\epsilon_t \sim N(0, R_t)$ are the standardized residuals (ϵ_t) of their conditional standard deviations.

The conditional variances for any individual asset can be obtained from the univariate GARCH model as follows:

$$h_{it} = \omega_i + \sum_{p=1}^{Pi}\alpha_{ip} r_{it-p}^2 + \sum_{q=1}^{Q1}\beta_{iq} h_{it-p} \; for \; i = 1, 2, 3, \ldots . k$$

where ω_i, α_{ip} and β_{iq} are non-negative and $\sum_{p=1}^{P_i}\alpha_{ip} + \sum_{q=1}^{Q_i}\beta_{iq} < 1$. h_{it} is the estimated conditional variance of the individual asset, α_{ip} is the short-run persistence of shocks to return P (the ARCH effects) and β_{iq} is the contribution of shocks to return Q to long-run persistence (the GARCH effects).

No	Symbol	Definition
1	EPU of China	Economic Policy Uncertainty of China
2	LNKLCI	Kuala Lumpur Composite Index
3	LNSTI	Straits Times Index–Singapore
4	LNIDX	IDX Composite Index–Indonesia
5	LNSET	SET Index–Thailand
6	LNPSEi	PSEi Index–the Philippines

Note(s): This table shows further details on the variables chosen in this study. Overall, we have chosen five ASEAN countries for analysis purpose
Source(s): Own elaboration

Table 1. Description of variables

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

Having obtained the conditional variances for any individual asset, then the dynamic correlation structure can be written as follow:

$$Q = \left(1 - \sum_{m=1}^{M} \alpha_m - \sum_{n=1}^{N} \beta_n\right)\overline{Q} + \sum_{m-1}^{M} \alpha_m(\epsilon_{t-m}\epsilon_{t-m}) + \sum_{n-1}^{N} \beta_n Q_{t-n}$$

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1}$$

where, $\overline{Q}$ is the unconditional covariance of the standardized residuals (ϵ_t); Q* is a diagonal matrix composed of the square root of the diagonal elements of Q_t, which is as follows:

$$Q_t^* = \begin{bmatrix} \sqrt{q_{11}} & 0 & \dots & 0 \\ 0 & \sqrt{q_{22}} & \dots & 0 \\ \vdots & \vdots & \vdots & 0 \\ 0 & 0 & \dots & \sqrt{q_{kk}} \end{bmatrix}$$

The element of R_t will be $P_{ijt} = \frac{qijt}{\sqrt{qiiqjj}}$ and the matrix R_t will be having a definite positive association, while K represents the covariance of assets. H_t signify direct definite association and can be illustrated as $H_t = D_t R_t D_t$. Furthermore, decompositions of H_t permits isolating conditional volatilities and correlations specification matters. For instance, a value of one can be utilized the GARCH (1, 1) archetypal for the variance $\sigma^2_{i,t-1}$, as below:

$$V(r_{it}|\Omega_{t-1}) = \sigma^2_{i,t-1} = \overline{\sigma}^2_i(1 - \lambda_{1i} - \lambda_{2i}) + \lambda_{1i}\sigma^2_{i,t-2} + \lambda_{2i}r^2_{i,t-1}$$

where, $\overline{\sigma}^2_i$ is the unconditional variance of the asset return; λ_1 *and* λ_2 are individual asset volatility parameters.

Under the restriction $\lambda_{1\mathrm{i}} + \lambda_{2\mathrm{i}} = 1$, the unconditional variance ($\overline{\sigma}^2_i$) will be vanished in the above equation and then we have the Integrated GARCH (I-GARCH) model, which reveals that conditional variance is non-stationary, and then the shock to variance is permanent.

3.3 Empirical estimation using the continuous wavelet transform (CWT)

To identify a time-varying property of co-movement in time-frequency space, this study uses wavelet coherence in the form of continuous wavelet transform (CWT). In this CWT model, it is not necessary to discover the structural breaks since it can address all the dynamics issues of financial time series depending on the length of data (Saiti *et al.*, 2016). The CWT is also able to capture the degree of correlations between two series which later can assist in the interpretation of two patterns of series easily. The CWT $W_x(\tau, s)$ is derived by forecasting the main wavelet ψ using the variables chosen for examination purposes. The equation for CWT $W_x(\tau, s)$ can be written as follow:

$$W_x(\tau, s) = \int_{-\infty}^{+\infty} \left[x(t)\frac{1}{\sqrt{s}}\overline{\psi}\left(\frac{t-\tau}{s}\right)\right]dt$$

where τ represents a time location in the phase domain, s capturing the scale of wavelet position in the regularity domain and $\frac{1}{\sqrt{s}}$ is measure a normalization factor to make sure the wavelets can compare with others across time-frequency and horizon. The CWT also provides further information on time and frequency by framing graphs by entering the function of τ and s.

Moving forward, wavelet coherence is used to measure the co-movement of two-time series over time and across frequencies. This wavelet coherence allows us to obtain a richer

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

description of the co-movement between two-time series variables. The equation of wavelet coherence is written as follows.

$$R^2_{xy}(\tau, s) = \frac{|S(s^{-1}W_{xy}(\tau, s))|^2}{\sqrt{S(s^{-1}W_{xx}(\tau, s))|^2 .\ S(s^{-1}W_{yy}(\tau, s))|^2}}$$

where, $R^2_{xy}(\tau, s)$ shows the scales between 0 and 1 (low to high) which represents a degree of relationship such as strong and weak. S epitomizes as a control operator in both time-frequency and scale. W_{xx} is a CWT of the time sequences X while W_{yy} is a CWT of time sequences of Y. W_{xy} postulate cross CWT between two series X. Therefore, by solving the above equation which is done using R-programming, we can produce a region in the time-series graph where two-time series move together and capturing time-frequency for both co-movements.

4. Results

4.1 Descriptive statistics

Table 2 shows the descriptive statistics of return for each of the ASEAN markets when there is a change in the EPU of China. From an investment perspective, the occurrence of China EPU can lead to higher volatility in markets, especially in Indonesia, followed by the Philippines. Although the Philippines and Indonesia record higher volatility, in terms of return, both these markets offered higher returns as compared with other ASEAN markets. This is consistent with the philosophy of higher risk and higher return. Somehow, the Thailand market seems to be less conservative by having less volatility and less return.

4.2 Findings using the MGARCH-DCC model

To meet our research objective, we performed an MGARCH–DCC analysis to investigate the impact of the EPU on China and selected ASEAN stock markets. The analysis via MGARCH–DCC enhances volatility modeling by making some assumptions flexible in terms of means and variances of the variables. We also illustrate both analyses; namely (1) Gaussian–DCC model and (2) t-DCC model as well as the outcome of results using a graphical way of plotting conditional correlations and volatilities. Table 3 shows the maximum likelihood (ML) forecast of λ_1 and λ_2 (parameters of volatility) and δ_1 and δ_2 (mean-reverting parameters) for each return series. Referring to Table 3, the total of estimated coefficients (λ_1 and λ_2) is less than 1.

We also have presented the discussion of the t-DCC model to determine which model is suitable for this study. The result of t-DCC is represented in Table 4. Based on Gaussian–DCC model, this ML for t-DCC postulates a gradual decay in volatility, the value for ML obtained under t-DCC is 1,373.40 is slightly higher than the one obtained under the Gaussian model of 1,360.30 thus, based on the rule of thumbs as discuss above t- DCC model is suitable for the analysis purpose. The discussion of analysis will be based on Table 4. It can be noted from

	LNEPU	LNKLCI	LNSTI	LNIDX	LNSET	LNPSEi
Mean	4.9530	7.1866	7.9012	7.8911	6.8867	8.2581
SD	0.7487	0.3060	0.2505	0.7508	0.4274	0.6285
Min.	3.2636	6.4463	7.1190	5.9621	5.8898	6.5226
Max.	6.8493	7.5405	8.2331	8.7957	7.5121	9.0784

Note(s): This table illustrates the descriptive statistics of the data used in this study. It consists of four elements such as mean, SD = standard deviation, Min = minimum value and Max = maximum value. The samples are EPU of China, LNKLCI, LNSTI, LNIDX, LNSET and LNPSEi
Source(s): Own elaboration

Table 2.
Descriptive statistics

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

Parameter	Estimate	SE	t- Ratio	[Prob]
Lambda1 (λ1)				
EPU of China	0.3701	0.1467	02.5221	0.013
KLCI	0.9095	0.0559	16.2692	0.000
STI	0.7863	0.0622	12.6292	0.000
IDX	0.8698	0.0523	16.6217	0.000
SET	0.7939	0.1284	06.1832	0.000
PSEi	0.7633	0.1537	04.9652	0.000
Lambda2 (λ2)				
EPU of China	0.3640	0.1013	3.5922	0.000
KLCI	0.0660	0.0344	1.9195	0.057
STI	0.1539	0.0406	3.7870	0.000
IDX	0.1120	0.0387	2.8884	0.004
SET	0.1594	0.0828	1.9256	0.056
PSEi	0.1268	0.0711	1.7820	0.077
Maximized log-likelihood	1,360.3			
df				

Note(s): This table reveals statistics of maximum likelihood-based on Gaussian–DCC Model for EPU of China and the ASEAN markets
Source(s): Own elaboration

Table 3. Maximum likelihood (ML) estimates based on the Gaussian–DCC model

Parameter	Estimate	SE	t- Ratio	[Prob]
Lambda1 (λ1)				
EPU of China	0.3725	0.1608	02.3169	0.022
KLCI	0.9099	0.0654	13.9123	0.000
STI	0.7821	0.0644	12.1354	0.000
IDX	0.8978	0.0510	17.5828	0.000
SET	0.9140	0.0498	18.3340	0.000
PSEi	0.7202	0.1566	04.5980	0.000
Lambda2 (λ2)				
EPU of China	0.3179	0.1059	3.0006	0.003
KLCI	0.0615	0.0369	1.6643	0.098
STI	0.1488	0.0433	3.4319	0.001
IDX	0.0888	0.0381	2.3284	0.021
SET	0.0703	0.0349	2.0121	0.046
PSEi	0.1386	0.0743	1.8643	0.064
Maximized log-likelihood	1,373.4			
df	9.6601			

Note(s): This table reveals statistics of maximum likelihood-based on Gaussian–t–DCC Model for EPU of China and the ASEAN markets
Source(s): Own elaboration

Table 4. Maximum likelihood (ML) estimates based on the t-DCC model

Table 4, the sum of the estimated coefficient (λ_1 and λ_2) is less than 1 for most of the parameters chosen, for instance, λ1_ KLCI + λ2_ KLCI (0.9099 + 0.0615 = 0.9714). Case in point, the lambda addition of EPU of China λ1_ EPUC + λ2_ EPUC (0.3725 + 0.3179 = 0.6904) still shows that the value is lower than 1, therefore the volatilities do not in line with I-GARCH Thus, any tremors to the volatilities are not tenacious. By following the assumption of assets volatility is tenacious given the shock in the economy, investors, in general, may lose all their funds although they have recorded good returns in the short run when there is a change in

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

uncertainty in the economic policy of China. Based on t-DCC, the result confirms that the volatilities of the EPU of China and the ASEAN stock market indexes are not strong and it would have an important signal to investors regarding safe investment. This outcome is also consistent with studies done by Nagayev *et al.* (2016) and Rahim and Masih (2016).

Table 5 shows the result of unconditional correlation and volatilities of the EPU of China and the ASEAN stock markets indexes. Unconditional volatilities are represented by on-diagonal while off-diagonal embodies unconditional correlation of each asset. Theoretically, as unconditional volatility gets closer to 0, the asset contains the least risk; however, if the unconditional volatility is close to 1, the assets realize a higher level of volatility. To make it clear, we sort the EPU of China and ASEAN stock indexes from lowest to the highest volatility.

Table 6 illustrates the orders of the unconditional volatilities of the ASEAN five stock indexes with the EPU of China. Interestingly, all ASEAN five indexes recorded low unconditional volatilities ranging from 0.035260 to 0.059175 and less volatile whenever there is an existence of uncertainty in China's economic policy. In reading, the EPU of China logged unconditional volatility of 0.46748, which can be considered moderately volatile. Furthermore, among the other ASEAN countries, the one that recorded the lowest volatility is KLCI-Malaysia. This evidence further supports the view postulated by Abdullah *et al.* (2016) and Sakti *et al.* (2018) that where the Malaysian market is reasonably stable when there are shocks in the capital markets.

Looking at the off-diagonal components in Table 5, we noticed that three stock market indexes are having negative correlations, namely, KLCI (−0.082983), STI (−0.052698), and IDX (−0.024667), while the other two markets are having positive correlation: SET (0.045596) and PSEi (0.0072629). Firstly, the positive correlation of 4.56% between SET and China is regarded as moderate and not too high. Over the last 10 years, the trade between Thailand

Table 5.
t- DCC unconditional correlations and volatilities

Parameters	EPU of China	KLCI	STI	IDX	SET	PSEi
EPU of China	0.46748					
KLCI	−0.082983	0.035260				
STI	−0.052698	0.67768	0.051487			
IDX	−0.024667	0.69123	0.72569	0.059175		
SET	0.045596	0.59786	0.69898	0.75050	0.057365	
PSEi	0.0072629	0.59422	0.66486	0.70357	0.60681	0.053659

Note(s): This table shows the unconditional correlation and volatility for the EPU of China and the ASEAN markets based on t-DCC model. The time horizon used in this study was from January 2003 until April 2019 (monthly data). It involves five ASEAN countries
Source(s): Own elaboration

Table 6.
The ranks of the unconditional volatilities of the EPU of China and the ASEAN-5

No.	EPU of China and ASEAN – 5 indexes	Unconditional volatility
1	KLCI	0.035260
2	STI	0.051487
3	PSEi	0.053659
4	SET	0.057365
5	IDX	0.059175
6	EPU of China	0.467480

Note(s): This table shows the rank of unconditional volatilities for the EPU of China and the ASEAN markets based on t-DCC model. The time horizon used in this study was from January 2003 until April 2019 (monthly data). It involves five ASEAN countries
Source(s): Own elaboration

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

and China has slowly grown compared with other ASEAN countries. Similarly, the EPU of China and the PSEi stock market recorded a positive correlation of 0.73% which is significantly lower. This indicates that the co-movement between the EPU of China and the PSEi stock market is not that worrying for the investors. As of now, the Philippines' trading with China is entering into a golden age of investment and the impact of economic and financial landscapes. At the end of 2018, the Chinese investment in the Philippines surged by more than 500% and the Chinese government has promised to invest at least $3 billion worth of investment in infrastructure and trade sectors. Since the correlation is positive and strongly related to the EPU of China, from the investors' point of view, these two markets seem less palatable risk-wise as the correlation is positive. Since the correlation is high, there are possibilities that if the Chinese government makes abrupt changes in economic policy, this might affect the performance of stock indexes of these two markets as their correlation is positive and the investor might not be interested to invest in them.

On the other hand, KLCI, STI and IDX recorded a negative correlation. From a theoretical perspective, we notice that negative correlation tends to provide a good return and offers better diversification benefits since the risks are diversified and well balanced. Firstly, we discuss the KLCI-Malaysia market where the correlation is negative (−0.082983). Although some issues are surrounding the economic relationship between Malaysia and China in terms of the number of projects canceled due to expense reasons and economical and financial scandals, the Chinese investment funds continue to play a significant role and cannot be judged by the economical controversies alone. Most of the investments are linked to infrastructure development which in the future can result in multiplier effects in terms of job creation and an increase in the standard of living. Thus, it is expected that the Malaysia–China relationship will remain strong. Both Malaysia and China welcome this direct and indirect investment from both countries through partnership and technology sharing methods. Secondly, STI-Singapore exhibited a negative correlation of (−0.052698). Singapore and China trade amounted to US$13.5 billion in 2018 and Singapore has big investments in Shanghai amounting to US$15.2 billion (with over 4,800 projects). This value gave strong confidence that there is the existence of positive economic collaboration between Singapore and China. The current initiative between the Singapore government and China via Singapore–Shanghai Comprehensive Cooperation Council (SSCCC) enables various incentives and sharing in terms of financial cooperation, sharing of technological innovation, people to people to exchanges, and many others. Given this initiative taken by the Singapore government and evidence from unconditional volatility (ranked number 2), there is a minimal impact on Singapore when there is a change in EPU of China. Since the impact is lower, thus it will be a good investment opportunity for the investors to protect their expected returns by channeling funds to Singapore.

Interestingly, although the correlation is negative for the IDX-Indonesia, the unconditional volatility among other ASEAN countries, Indonesia recorded the highest volatility (0.059175). The EPU of China has a greater impact on the Indonesian market. For example, due to the trade war between China and US, has led to a deficit of $6.68 billion for Indonesia since China is the main economic partner for Indonesia. Furthermore, both countries, encountered an economic slowdown, which was indirectly affecting the Indonesian market. Investment opportunities will be good if they invest in commodities instead of stock trading until the trade war is over between two gigantic countries.

Figure 1 illustrates the conditional volatilities of EPU of China and ASEAN stock markets. Throughout 16 years (monthly basis from January 2003 to April 2009), we can observe that most ASEAN stock markets move in the same direction when there is a change in the EPU of China. The rapid changes in the ASEAN stock market occurred during 2008 and 2009 due to the economic global crisis in 2008 and the falling of oil prices continuously. Thus, the higher volatilities occurred during the period of the financial crisis in 2008 and the shocks toward ASEAN markets are significantly higher with an upward trend. Furthermore, the directions

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

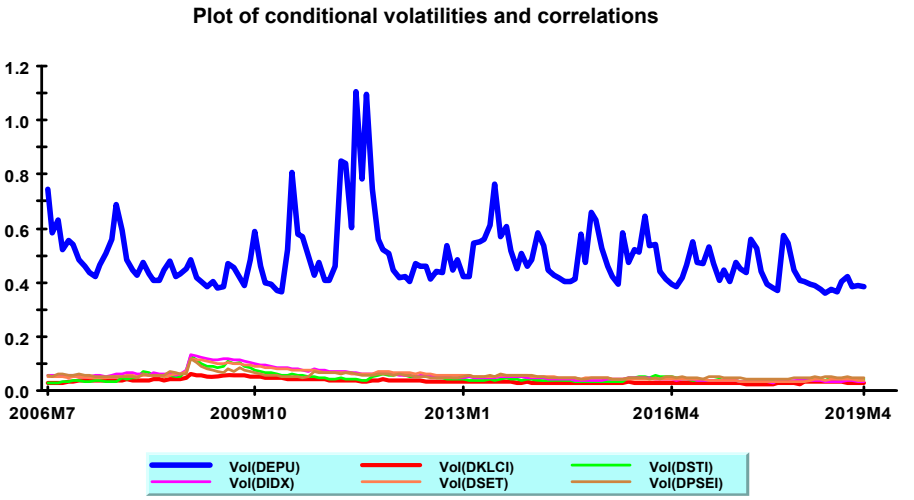


Figure 1.
Conditional volatilities of the EPU of China and selected indexes

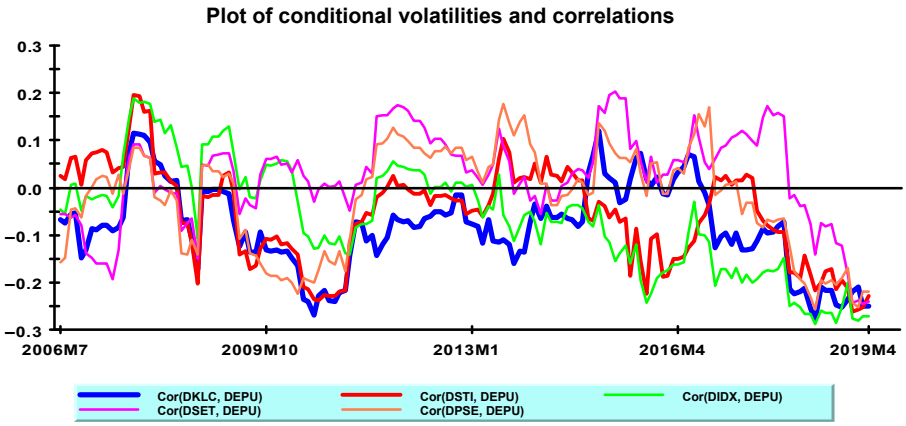
Source(s): Generated by the authors from Microfit software

of movement are more or less similar, indicating there is an existence of high convergence of volatility among ASEAN markets throughout the period of analysis due to higher financial integration among the indexes.

Figure 1 also revealed that IDX–Indonesia is volatile rapidly compared to other ASEAN markets when there is an aggressive change in EPU of China. The lowest volatility occurred at KLCI–Malaysia. The results seem to be consistent with Table 6. One striking point to be noted at conditional volatilities is that the EPU of China is consistently insignificant from 2011 to 2013. There are a few explanations for this rapid uncertainty: namely (1) the issue of European immigration arising from Chinese economy concerns from 2014 to 2015, (2) early 2011 and 2013, we can notice there is a general transition in China's leadership which led to changes in economic and financial policies, (3) during the period, China becomes the most powerful decision-making state in the region and (4) the effect of "generational transfer of power" in China (Davis, 2016). All these explanations can be tied to the Chinese economy internally instead of spillover to their trading partners. That is why the effect is not that substantial for ASEAN markets during 2011 and 2013 to ASEAN market as it recorded lower volatilities. As far as the investment side is concerned, based on the unconditional volatilities as revealed in Figure 1, we might conclude the Malaysia market to be the safest for investment purposes followed by STI and other ASEAN markets considering there is an existence of EPU in China.

Additionally, in Figure 2, we observe conditional correlations between the EPU of China and the ASEAN stock markets. From the period 2006–2009, the movement of ASEAN stock markets seems to be in tandem with the EPU of China and the highest correlation occurred among STI and IDX. Also, once the financial crisis hits the ASEAN market, we can observe that all sample markets' correlations start to decrease. From 2009 until 2013, again we can notice a similar pattern of movement. At this time, KLCI had the lowest correlation position, while SET gained a higher correlation trend between 2012 and 2013. From 2013 to 2014, KLCI achieved a low correlation, while STI and PSEi are obtaining a positive correlation. A rapid change in correlation occurred at IDX followed by KLCI, PSEi, STi, and SET. By considering different time horizons, the markets that can be considered "safe haven" for investment purposes when there is a change in the EPU of China are KLCI, IDX and STI. These three markets are thus expected to offer good diversification opportunities for Investors.

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026



Source(s): Generated by the authors from Microfit software

Figure 2. Conditional correlations of the EPU of China with ASEAN – 5

4.3 Findings using wavelet coherence

The CWT results range from scale 1 (one day) to scale 6 (64 days). The horizontal axis shows the time horizon in terms of trading days, while the vertical axis represents the different holding periods. The curved line represents the 5% significance level based on simulations derived from the Monte Carlo analysis. The wavelet coherence uses color codes to show the strength of correlations, whereby blue color indicates low correlations between two assets and red color shows high correlations. Next, if the path arrows show a point in the right direction, it suggests that the assets move in phase (positive connexion). Oppositely, when the arrow points to the left, it means that assets are out of phase (negative connexion). Furthermore, if the arrows point to the right and down, it means that the first asset is leading; however, when the vector arrows point to the right and up, it suggests that the second asset is leading. In this study, the EPU of China (LNEPU) is known as the first asset in all cases of wavelet coherence results. We only cover discussion of short-term and medium-term due to constraints in obtaining data.

At a glimpse, the correlations between EPU of China with Indonesia, Malaysia, Singapore, Thailand and the Philippines stock indexes are relatively low in very-short holding periods (2–8 days). Nevertheless, we notice that the stock indexes of Indonesia, the Philippines and Malaysia have a stronger correlation in this period (2–8 days) than those of Thailand and Singapore. We notice that the EPU of China has a substantial impact on Indonesia's stock indexes, particularly in a very short holding period. As we argued earlier, the trade war between China and US, likely to affect the Indonesian market with major impacts, particularly in a very short holding period.

The Philippines stock index with EPU of China is highly correlated in a very short holding period. As of now, the trading activities between the Philippines and China have entered an upward trend whereby the Chinese investment in the Philippines has surged by more than fivefold, and there are nearly 30 economic agreements signed to elevate the Philippines economy. Similar to Indonesia, if China changes its economic policy abruptly, it is likely to affect the Philippines market, particularly during a very short holding period. Next, although Malaysia has a lower correlation with China compared to other ASEAN countries when we look at more details, it has a strong correlation in a very short holding period. In other words, the EPU of China has a strong correlation with Thailand, Malaysia and the Philippines stock market index in a very short holding period. Hence, if the investors want to invest their funds

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

in this very short holding period, investing in ASEAN stock indexes other than Thailand, Malaysia and the Philippines is a more viable option.

Moving forward, for medium stock holding periods (8–64 days), the figure above reveals lower correlations of EPU of China with stock indices, except for the Philippines stock index. As far as the Philippines market is concerned, the degree of association was high in these medium investment horizons during the selected period. The EPU of China has a substantial impact on the Philippines stock index, particularly in the medium holding period. Accordingly, if investors want to invest in this medium holding period, investing in ASEAN countries other than the Philippines is a viable option (see Figure 3).

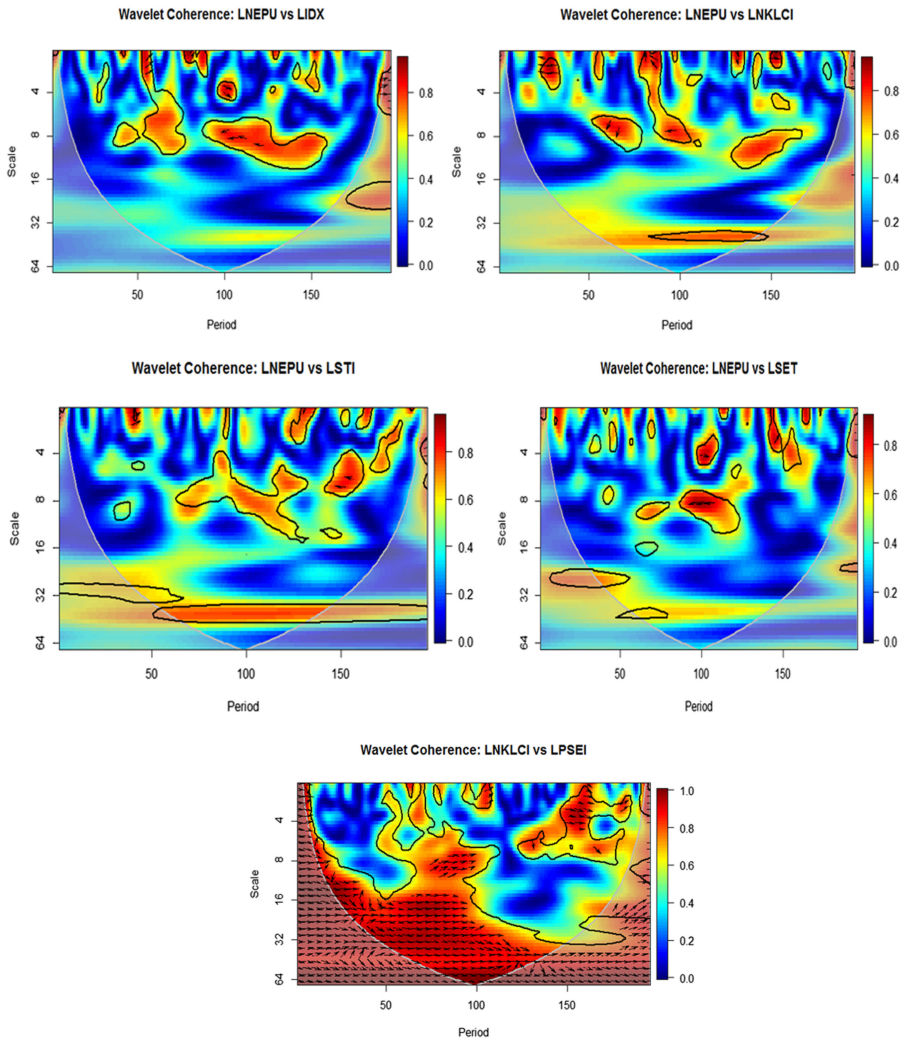


Figure 3.
Continuous wavelet transform: EPU of China and ASEAN – 5

Source(s): Produced by the authors from *R*-programming

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

5. Conclusions

Firstly, results from multivariate GARCH indicate that three ASEAN stock markets (KLCI, STI and IDX) exhibit a negative correlation while the other two (SET and PSEi) show a positive correlation. These results are based on the unconditional correlation and volatility analysis. In terms of ranking of unconditional volatilities, we found that all five indexes achieved low unconditional volatilities indicating that these stock markets are less volatile given there is a change in China's economic policy. This is perhaps due to diverse economic structures and market integrations among the constituent markets. Following that, it is also notable that, KLCI recorded the lowest volatility, and based on the conditional volatilities plot, we observe the Malaysia market to be the safest of the sample for investment purposes followed by STI.

Results using wavelet coherence transform for short- and medium-term as a benchmark for investment purposes suggest that between 2 and 8 days the correlation between EPU of China and the sample stock markets is smaller in short holding periods. Given this, as far as short period holding is concerned, the best market for investment opportunities would be in ASEAN markets other than Thailand, Malaysia and the Philippines. For the medium term, we observe that the EPU of China has a significant impact on the Philippines stock index, especially during the medium holding period. Accordingly, if investors want to go for medium-term investment, investing in ASEAN countries other than the Philippines is a superior alternative.

The implications of this study's findings are as follows. In terms of theoretical implication, our study contributes to the body of knowledge, especially by adding fresh evidence on the relationship between EPU and regional investment diversification using advanced techniques, especially in an emerging market context. Methodologically as well, this study is a novel venture to the best of the authors' knowledge. This study also offers several managerial implications based on individual ASEAN economies relating to EPU of China. In the case of Malaysia, the EPU of China will affect Malaysian markets due to good economic cooperation between these two countries. China's investment in Malaysia plays a significant role, especially in infrastructural projects which create multiplier effects on the Malaysian economy. However, given the diversification of Malaysia's economic and financial markets, Malaysia's exposure to international shocks is relatively stable compared to other ASEAN countries. This fact was argued by Abdullah *et al.* (2016) and Sakti *et al.* (2018) wherein terms of investment are a concern, Malaysia is still a better option for the investor given the universality factor.

The EPU of China toward the Singapore market consider relatively stable given the facts of (1) the Singapore market is small and uniquely diversified and (2) good technological sharing between China and Singapore. Investors, if they want to look reasonably good diversification benefit from investment opportunities, may consider investing in Malaysia and Singapore. The EPU of China obviously will dampen the growth of Indonesia in terms of economic growth and financial market performance. These two countries are having good economic collaboration. However, the trade war between the US and China is expected to impact the Indonesian market, especially international trade, business confidence, and economic growth since Indonesia benefitted from an open and rules-based trading system. Although the trade war between US and China increases the EPU of China, the strategies taken by Indonesia policymaker may give relief to the investors in considering investment opportunities in Indonesia. This is because the government of Indonesia taking serious attention to this problem and implementing several strategies such as diversifying export and a possible sign of new negotiations for regional and bilateral economic agreements with other countries such as Chile, Australia, and the European Union to counter back the effect of US and China trade war. The other two markets, Thailand and the Philippines, are tumbled as well given the facts of the trade war between the US and China which interrupt their export, exchange rate, and economic activities. Thus, we believe that to promote prosperity, policymakers must design sound economic policies. In other words, the clarity of economic policymaking or a good economic blueprint is very important, especially to counter unexpected events or HV time, which can lead to more stable markets. Finally,

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

the outcome or findings of our study are expected to aid the retail and institutional investors in designing better strategies for diversifying stock portfolios with different holding periods. As for future research recommendations, it would be impactful if the future studies focus more on the importance of the EPU in the long run and correlations to diverse asset classes such as money markets and bonds. Another extension of future research could be in the form of a firm or microeconomic-level analyses.

References

Abdullah, A.M., Saiti, B. and Masih, M. (2016), "The impact of crude oil price on Islamic stock indices of Southeast Asian countries: evidence from MGARCH-DCC and wavelet approaches", *Borsa Istanbul Review*, Vol. 16 No. 4, pp. 219-232.

Baker, S., Bloom, N., Davis, S. and Wang, X. (2013), *A Measure of Economic Policy Uncertainty for China*, Work in Progress, National Bureau of Economic Research, Inc.

Baker, S.R., Bloom, N. and Davis, S.J. (2016), "Measuring economic policy uncertainty", *The Quarterly Journal of Economics*, Vol. 131 No. 4, pp. 1593-1636.

Becker, W. and Peters, J. (1998), "R&D-competition between vertical corporate networks: market structure and strategic R&D-spillovers", *Economics of Innovation and New Technology*, Vol. 6 No. 1, pp. 51-72.

Beirne, J., Caporale, G.M., Schulze-Ghattas, M. and Spagnolo, N. (2010), "Global and regional spillovers in emerging stock markets: a multivariate GARCH – in – mean analysis", *Emerging Markets Review*, Vol. 11 No. 3, pp. 250-260.

Boako, G. and Alagidede, P. (2018), "African stock markets in the midst of the global financial crisis: recoupling or decoupling?", *Research in International Business and Finance*, Vol. 46, pp. 166-180.

Bollerslev, T. (1990), "Modelling the coherence in short-run nominal exchange rates: a multivariate generalized ARCH model", *Review of Economics and Statistics*, Vol. 72 No. 3, pp. 498-505.

Brunnermeier, M. and Pederson, K. (2009), "Deciphering the liquidity and credit crunch 2007-2008", *Journal of Economic Perspectives*, Vol. 23 No. 1, pp. 77-100.

Caporale, G.M., Gil-Alana, L.A. and You, K. (2022), "Stock market linkages between the Asean countries, China and the US: a fractional integration/cointegration approach", *Emerging Markets Finance and Trade*, Vol. 58 No. 5, pp. 1502-1514, doi: 10.1080/1540496X.2021.1898366.

Caporale, G.M., Howells, P.G. and Soliman, A.M. (2004), "Stock market development and economic growth: the causal linkage", *Journal of Economic Development*, Vol. 29 No. 1, pp. 33-50.

Davis, S.J. (2016), *An Index of Global Economic Policy Uncertainty (No. w22740)*, National Bureau of Economic Research.

Duan, Y., Chen, W., Zeng, Q. and Liu, Z. (2018), "Leverage effect, economic policy uncertainty and realized volatility with regime switching", *Physica A: Statistical Mechanics and Its Applications*, Vol. 493, pp. 148-154.

Ehrmann, M. and Fratzscher, M. (2006), "Equal size, equal role? Interest rate interdependence between the Euro area and the United States", *The Economic Journal*, Vol. 115, pp. 928-948.

Engle, R.F. (2002), "Dynamic conditional correlation - a simple class of multivariate GARCH models", *Journal of Business and Economic Statistics*, Vol. 20 No. 3, pp. 339-350.

Engle, R.F. and Kevin, S. (2001), *Theoretical and Empirical Properties of Dynamic Conditional Correlation Multivariate GARCH*, UCSD, Working Paper N° 2001-15.

Forbes, K. and Chinn, M. (2004), "A decomposition of global linkages in financial markets over time", *Review of Economics and Statistics*, Vol. 86 No. 3, pp. 705-722.

Jan, F. and van Vuuren, G. (2021), "Portfolio performance under tracking error and benchmark volatility constraints", *Journal of Economics, Finance and Administrative Science*, Vol. 26 No. 51, pp. 202194-203111.

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026

Levine, R. and Zervos, S. (1998), "Stock markets, banks, and economic growth", *American Economic Review*, Vol. 88 No. 3, pp. 537-558.

Li, Y., Ma, F., Zhang, Y. and Xiao, Z. (2019), "Economic policy uncertainty and the Chinese stock market volatility: new evidence", *Applied Economics*, Vol. 51 No. 49, pp. 5398-5410.

Liu, L. and Zhang, T. (2015), "Economic policy uncertainty and stock market volatility", *Finance Research Letters*, Vol. 15, pp. 99-105.

Ma, F., Wahab, M., Liu, J. and Liu, L. (2018), "Is economic policy uncertainty important to forecast the realized volatility of crude oil futures?", *Applied Economics*, Vol. 50 No. 18, pp. 2087-2101.

Malkiel, B.G. and Fama, E.F. (1970), "Efficient capital markets: a review of theory and empirical work", *The Journal of Finance*, Vol. 25 No. 2, pp. 383-417.

Miao, Y. and Zhi-Qiang, J. (2016), "The dynamic correlation between policy uncertainty and stock market returns in China", *Physica A: Statistical Mechanics and Its Applications*, Vol. 461 No. 1, pp. 92-100.

Nagayev, R., Disli, M., Inghelbrecht, K. and Ng, A. (2016), "On the dynamic links between commodities and Islamic equity", *Energy Economics*, Vol. 58, pp. 125-140.

Ngo, T. (2019), "Return and volatility spillover across equity markets between China and Southeast Asian countries", *Journal of Economics, Finance and Administrative Science*, Vol. 24 No. 47, pp. 66-81.

Rahim, A. and Masih, M. (2016), "Portfolio diversification benefits of Islamic investors with their major trading partners: evidence from Malaysia based on MGARCH-DCC and wavelet approaches", *Economic Modelling*, Vol. 54, pp. 425-438.

Saiti, B., Bacha, O.I. and Masih, M. (2016), "Testing the conventional and Islamic financial market contagion: evidence from wavelet analysis", *Emerging Markets Finance and Trade*, Vol. 52 No. 8, pp. 1832-1849.

Sakti, M.R.P., Masih, M., Saiti, B. and Tareq, M.A. (2018), "Unveiling the diversification benefits of Islamic equities and commodities: evidence from multivariate-GARCH and continuous wavelet analysis", *Managerial Finance*, Vol. 44 No. 6, pp. 830-850.

Sum, V. (2012), "Economic policy uncertainty and stock market performance: evidence from the European union, Croatia, Norway, Russia, Switzerland, Turkey and Ukraine", *Journal of Money, Investment and Banking*, Vol. 25, pp. 99-104.

Tarek, E., Saeed, Y., Hammam, R. and Aboul Soud, S. (2020), "The associations between stock prices, inflation rates, interest rates are still persistent: empirical evidence from stock duration model", *Journal of Economics, Finance and Administrative Science*, Vol. 25 No. 49, pp. 149-161.

Wu, T.P., Liu, S.B. and Hsueh, S.J. (2016), "The causal relationship between economic policy uncertainty and stock market: a panel data analysis", *International Economic Journal*, Vol. 30 No. 1, pp. 109-122.

Further reading

Chein, M., Chien-Chiang, L., Hu, T. and Hu, H. (2015), "Dynamic Asian stock market convergence: evidence from dynamic cointegration analysis among China and ASEAN-5", *Economic Modelling*, Vol. 51 No. C, pp. 84-98.

Corresponding author
Hassanudin Mohd Thas Thaker can be contacted at: hassanfinance21@yahoo.com

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: **permissions@emeraldinsight.com**

Downloaded from ftp.nowpublishers.com/jefas/article-pdf/27/54/277/1463697/jefas-04-2021-0032.pdf by guest on 22 October 2026