Economic Policy Uncertainty (EPU) and its Predictability: A Systematic Literature Review

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Abstract
Purpose: The main purpose of this paper is to determine the current trend of studies conducted on the predictive power of Economic Policy Uncertainty (EPU) on financial markets.
Design/methodology/approach: This study was led via a Systematic Literature Review (SLR) by the PRISMA Statement (Preferred Reporting Items for Systematic Review and Meta-Analyses). The PRISMA Statement is guided by three steps: 1) establishing specific research questions to conduct systematic research, 2) Determine the criteria for inclusion and exclusion, and 3) analysing large databases of scientific literature in a specific time frame. Research articles between 2016 and 2020 were gathered based on the selected keywords and inclusion criteria.
Findings: The result of the study indicates that EPU can potentially be used to forecast the returns and volatility of financial markets. However, there are several areas that are currently understudied and needs further validations, for instance, the financial markets in the emerging economies.
Research limitations/implications: This paper identifies the gaps in the research on Economic Policy Uncertainty and Financial Markets by conducting a comprehensive systematic literature review.
Practical Implications: The findings of this study are likely to have ramifications for investors and policy makers in terms of using EPU index to add value to investments as well as manage risk effectively.
Originality/value: To the best of author's knowledge, little effort has been devoted to systematising the literature on the predictability of economic policy uncertainty on financial markets, hence, this gap is bridged by the research.

Keywords*:* Economic Policy Uncertainty, Predictability, Financial Markets Uncertainty, Forecast, PRISMA, Systematic Literature Review

Introduction

Employing news-based uncertainty indexes to predict or forecast the returns and/or the volatility of various financial market instruments has become increasingly popular in these recent years. Aside from that, news-based uncertainty indexes are frequently employed to assess and record how financial markets react and behave towards uncertainty. Some of the most widely used news-based indexes includes news-based implied volatility (NVIX) that was developed by Manela and Moreira (2017), economic policy uncertainty (EPU) introduced by Baker *et al*., (2016), and geopolitical risk (GPR) that was recently developed by Caldara and Iacoviello (2018) and among these three indexes, the one that is most used is the EPU index.

In this study, we will be only focusing on the predictability of EPU index on various financial market instrument.

The EPU index's primary objective is to act as a strong proxy for policy-related economic uncertainties across time. The EPU index was developed by Baker *et al.*, (2016) in various stages guided by several predetermined protocols. The first version of the EPU index which was developed back in 2013 was primarily meant to reflect economic policy uncertainty in the US market. The US EPU index was built based on three main components. (1) several newspapers articles reporting on policy issues connected to economic uncertainty, (2) anticipated revenue effect of federal tax code provisions scheduled to expire soon, and (3) economic policy uncertainty that is measured by differences of opinion and disagreement among economists and forecasters on policy-related issues.

The first component of the US EPU index was developed using several large newspapers, including Boston Globe, Los Angeles Times, New York Times, USA Today, and several others. To construct the news-based index, articles from the archive dating back to January 1985 that contains keywords such as 'uncertainty', 'economy', 'congress', 'deficit', 'legislation', 'regulatory', 'white house' were selected. The EPU index's second component is based mostly on papers from the Congressional Budget Office (CBO), which detail federal tax code provisions that are set to expire soon. Finally, the EPU index's third component is derived from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters (SPF). At the time of writing, policyuncertainty.com offers EPU indexes for more than 20 countries and a global version of the index that proxy global level of economic policy uncertainty known as the Global Economic Policy Uncertainty (GEPU). As at to date, the academic community has extensively examined the impact of economic policy uncertainty on a variety of economic sectors by using these EPU indexes.
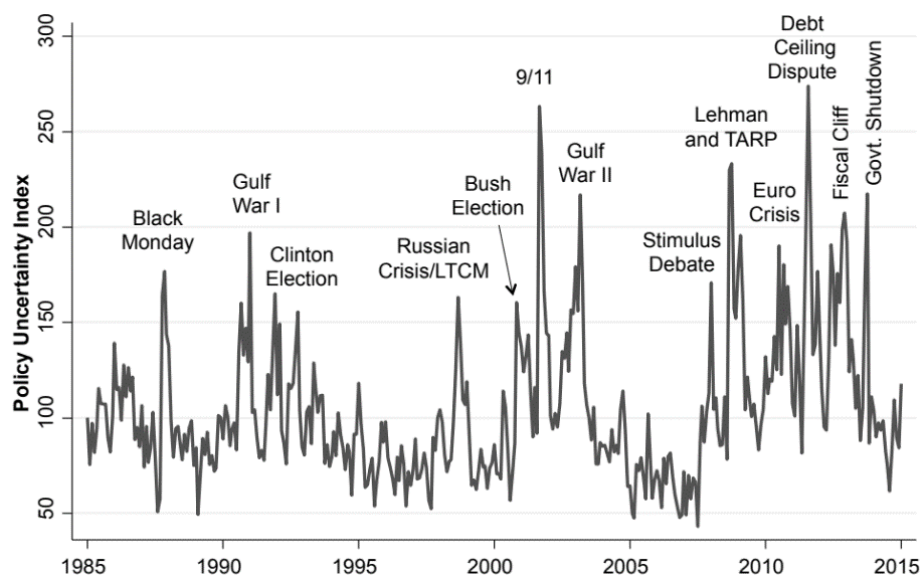

Figure 1: Economic Policy Uncertainty (EPU), Baker *et al.*, (2016)

The popularity of utilizing the EPU index to scrutinize the effects of economic policy uncertainty on various segments of the economy have been documented in numerous research papers. Both academicians and practitioners have explored the impact of EPU on firm-level investment (Wu *et al.*, 2020; Kang *et al.*, 2014), corporate investment (Akron *et al.*, 2020; Wang *et al.*, 2014), unemployment (Caggiano *et al.*, 2017), financial stability (Phan *et al*, 2021), exchange rate expectation (Beckmann and Czudaj, 2017), bank loan pricing (Ashraf and

Shen, 2019), bank credit growth (Nguyen *et al*., 2020; Bordo *et al*., 2016), recessions (Karnizova and Li, 2014; Benati, 2013), tourism (Akadiri *et al.,* 2020; Isik *et al*., 2020; Wu and Wu, 2019; Gozgor and Ongan,2017), carbon emission (Adedoyin and Zakari, 2020; Jiang *et al*., 2019), real output (Istiak and Serletis, 2018), firms financial decision (Liu and Zhang, 2020), firm performance (Iqba *et al*., 2020), cash holdings (Demir and Ersan, 2017), capital structure choice (Zhang *et al.*, 2015), global trade flow (Tam, 2018), foreign direct investment flow (Canh *et al*., 2020), housing market returns (Antonakakis *et al*., 2015), corporate risk taking (Tran, 2019), and inflation expectations (Istrefi and Piloiu, 2014). These studies demonstrate that EPU has substantial influence on economic fundamentals.

There is a strand of literature that examined the nexus between EPU and financial markets. EPU have significantly influenced stock markets (Su *et al*., 2019; Christou et al., 2017; Tsai, 2017; Li et al., 2016; Sum, 2012), bond markets (Cepni *et al*,, 2020; Chiang, 2020; Broadstock and Cheng, 2019; Fang *et al.*, 2017; Wang *et al.*, 2017), foreign exchange markets (Al-Yahyaee *et al.,* 2020; Chen *et al*., 2020; Kido, 2016; Krol, 2014), commodity markets (Lyu *et al*., 2021; Qin *et al*., 2020; Chai *et al.*, 2019; Xiao *et al*., 2019; Antonakakis *et al*., 2014) and cryptocurrency markets (Yen and Cheng, 2021; Colon *et al*., 2021; Chen *et al*., 2021; Umar *et al*., 2021; Wang *et al*., 2020).

From the stock market perspective, the study of Su *et al*., (2019), which compares the effects of US EPU on six industrialized and three developing countries stock markets finds that EPU has significant positive correlation with the stock markets of industrialized countries. On the other hand, while assessing the impact of EPU on ASEAN stock markets using Granger causality test, Sum (2013c), documented that only the stock market of Singapore and Malaysia react towards the changes in US EPU. While assessing the impact of EPU on pacific-rim countries, Christou *et al*., (2017) finds that the US EPU affects the stock markets of all the pacific-rim countries except for Australia.

From the bond market context, the study of Broadstock and Cheng (2020) found that the changes in EPU have a significant impact on the correlation between green and black bonds, whilst the study of Chiang (2020) indicated that the increased level of EPU decreases the demand for bonds. From the foreign exchange market viewpoint, Al-Yahyaee *et al*., (2020) found that the domestic EPUs are the major source of exchange rate volatility in emerging economies. On the other hand, while investigating the impact of US EPU on the Japanese Yen, Kido (2016) finds that the Japanese Yen tends to gradually appreciate when the level of US EPU increases.

From the commodity market perspective, Antonakakis *et al*., (2014) finds that EPU has a detrimental impact on oil prices and while assessing the impact of EPU on gold futures market, Fang *et al*., (2018), finds that the EPU has a strong positive influence over the volatility of gold futures market. Recent studies have also focused on the impact of EPU on cryptocurrency markets. The study of Yen and Cheng (2021) finds that the China EPU is a key factor that determines the volatility of Bitcoin and Litecoin. Another important finding was that Bitcoin returns were found to be higher on days with a high level of EPU than on days with a low level of EPU (Wang *et al*., 2020). Chan *et al*., (2021) finds that Bitcoin can be used as hedge against policy uncertainty in China since China's EPU have a positive impact on Bitcoin returns.

To put this in a broader perspective, there are a large number of literatures that have been published in the past, that examine to what extend EPU possess the ability to affect or influence part and parcel of the economic components. For instance, the literature review of Al-Thaqeb and Algharabali (2019) reviews the studies on the impact of EPU on both macro and micro level of financial market, corporate behaviour, and risk management. The authors only covered the impact of EPU and most of the existing studies also mainly focused of the impact of EPU on financial markets and to the best of our knowledge there is only a few studies that examined

the predictability of EPU on various segments of the financial market. In this paper we intend to show that the EPU index has the ability to predict financial markets instruments such as stocks (Balcilar *et al*., 2019; *Phan et al.*, 2018; Lei and Song, 2020), bonds (Ioannidis and Ka, 2018), exchange rates (Abid, 2020; Zhou *et al*., 2020; Balcilar *et al*., 2016), commodities (Bahloul *et al*., 2018; Fang *et al*., 2018; Shahzad *et al*., 2017), and cryptocurrencies (Liang *et al*., 2020; Yu, 2019).

The primary objective of this paper is to solely focus on the predictability of EPU. Therefore, this paper provides a comprehensive review on the predictability of EPU mainly on the financial markets. This paper also collates and assembles recent studies on the predictability of EPU on both the returns as well as the volatility of the financial market instruments and also highlights the methodologies that has been applied in those studies. Besides that, this paper also documents which are the markets that the EPU index is able or unable to predict. The outcome of the study is expected to have potentially important implications for investors, fund managers, portfolio managers, academicians, and policy makers in terms of risk management, portfolio composition, and application of proper investment strategies to minimize risk and maximize profit.

The remainder of this paper is structured as follows. First, the research method and systematic literature review (SLR) are presented in this study. After that, there follows a discussion of the findings. Finally, the study concludes and suggests some prospective research area for future study.

Methodology

The research method that was selected for this study is known as Systematic Literature Review (SLR). According to Lagorio *et al.,* (2016), SLR allows researchers to spot trends and gaps in the scientific literature. Apart from that, Friday *et al*., (2018) postulates that, via SLR, researchers could combine and synthesise previous research, develop new perspective, generalize research findings, and examine future research avenue. In this study, the SLR method was employed to gather articles that discusses the predictability of EPU index on the return and volatility of financial markets. To conduct a comprehensive SLR, the authors utilized a technique known as PRISMA. Through this technique, articles from large database such as ScienceDirect, Scopus, Emerald, Wiley, and several others were selected for the SLR. Besides that, the eligibility and exclusion criteria were determined, and followed by the reviewing process (identification, screening, and eligibility) as well as carrying out the data abstraction and analysis.

PRISMA

The PRISMA Statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) served as a framework for our SLR. PRISMA is a popular technique frequently used in the social sciences and it is an essential tool for summarizing evidence accurately and reliably. A group of 29 review authors, researchers, methodologists, and medical editors collaborated to develop the PRISMA Statement (Moher *et al*., 2009). According to PRISMA's originator, the key aspects of PRISMA techniques includes, (1) establishing specific research questions to conduct systematic research, (2) determining the criteria for inclusion and exclusion, and (3) analysing large databases of scientific literature in a specific timeframe.

Research Question

The following research question drove the literature search: Does EPU index has the ability to predict the returns and volatility of financial markets such as stock markets, bond markets, commodity markets, foreign exchange markets, and cryptocurrency markets? The primary

objective of this research is to scrutinize relevant studies that explores the predictability of EPU index on the returns and volatility of financial markets. PRISMA is used to answer the research question by exploring existing studies (see Figure 2).
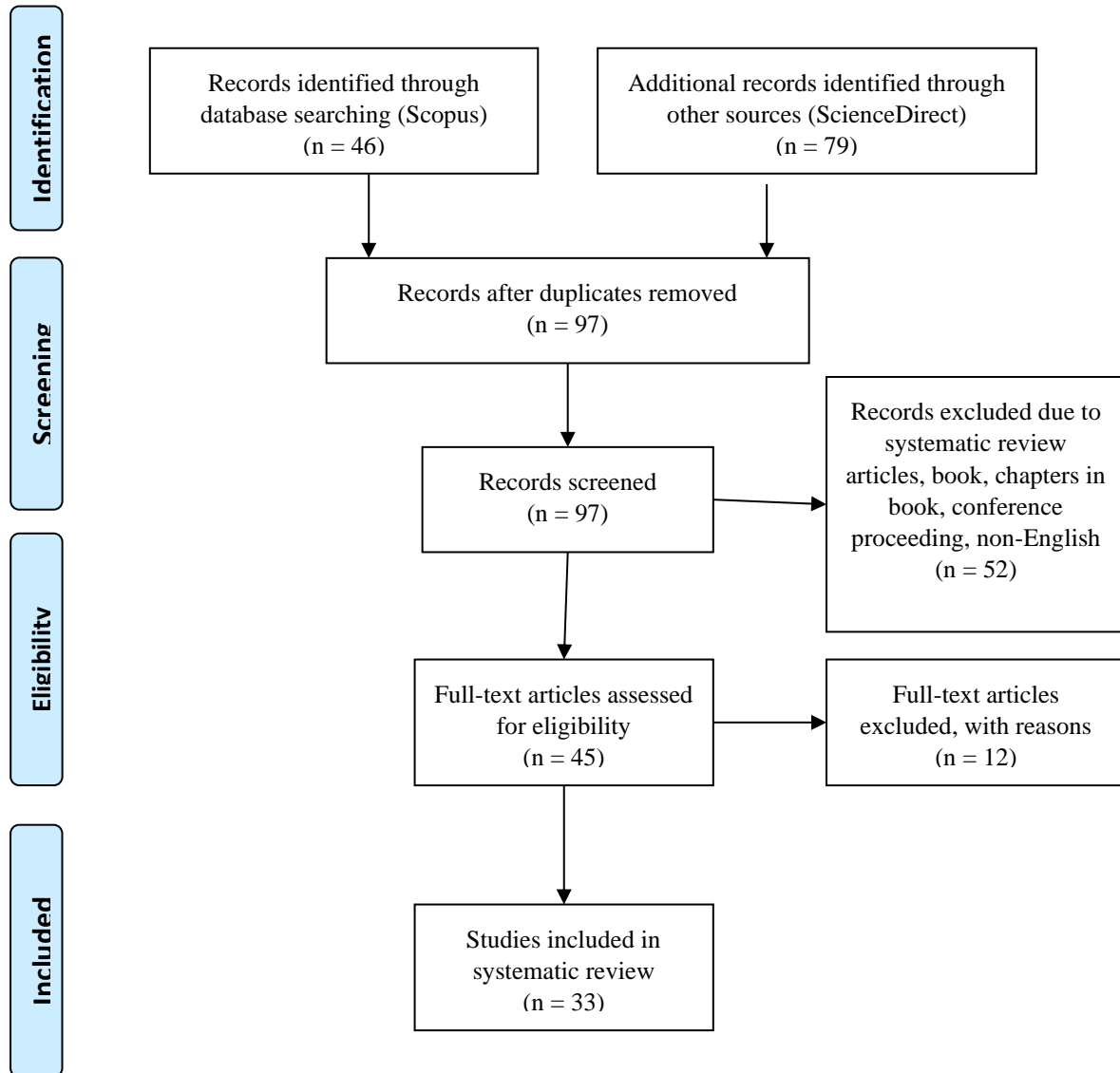

Figure 2: The flow diagram of the study adopted by The PRISMA Group (Moher *et al.*, 2009)

Inclusion and Exclusion Criteria

Several criteria for inclusion and exclusion were established. In terms of literature type, only journal articles containing empirical data were included, excluding books, book chapters, book series, conference proceedings, editorials, notes, review articles, working paper, and thesis. Second, only articles published in the English language were examined, to avoid any confusion or problem in translation. In terms of timeframe, as shown in Table 1, a five-year period (2016-2020) was chosen, which corresponds to the availability of the EPU index.

Table 1: The Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Literature type	Journal (research articles)	Journals (systematic review), books, chapters, conference proceedings, editorials, notes, working paper, thesis.
Language	English	Non-English
Timeframe	2016-2020	< 2016; > 2020

Sources of Data

This study included Finance and Economics studies from two major journal database, Scopus and ScienceDirect. It should be remembered, however, that no database, including Scopus and ScienceDirect, is complete and comprehensive. Authors should conduct their search procedures using additional databases (Younger, 2010), to increase the likelihood of finding noteworthy publications. As a result, the current study conducted manual searches in a number of well-known sources, including Emerald, Springer, Taylor and Francis, Wiley-Blackwell, and Sage. With more than 24,600 journals from 5,000 publishers worldwide, Scopus is one of the largest abstracts and citation database of peer-review articles covering several areas including economics, finance, and econometrics. On the other hand, ScienceDirect is a large database with over 1.4 million open access articles that covers a wide range of topics including business, economics, econometrics, and finance.

Systematic Review Searching Process

The systematic review procedure, which took place in September 2021, was divided into four parts. The initial part was to find the appropriate keywords that will be used in the search process. As shown in Table 2, keywords such as "EPU", "predictability", "forecast", and "financial market" were used in the searching process. After obtaining all the relevant articles, the authors conducted a thorough examination and 28 duplicate articles were removed.

Table 2: Keywords used for the Systematic Review Process

Database	Keyword used
Scopus	TITLE-ABS-KEY ("EPU" OR "economic policy uncertainty") AND ("predict" OR "predictability" OR "forecast") AND ("financial market")
ScienceDirect	("EPU" OR "economic policy uncertainty") AND ("predict" OR "predictability" OR "forecast") AND ("financial market")

The next stage involved a thorough screening process. At this stage, a total of 52 articles were eliminated from the 97 articles that were eligible for evaluation. In the third stage, the authors assessed the full article of the remaining 45 articles. A total of 2 articles were removed after a thorough review. Those articles were omitted because they did not focus on the predictability of EPU on financial markets. The last stage of the evaluation yielded a total of 33 empirical quantitative papers, which were then analysed further. As shown in Table 3, in terms of area of study, 16 out of 33 articles focused on stock markets, 10 articles focused on commodity

markets, 4 articles focused on foreign exchange markets, 2 articles focused on cryptocurrency markets, and 1 article focused on bond markets.

Table 3: Area of Study

Area	No. of papers	(%)
Stock Market	16	48.48
Commodity Market	10	30.30
Foreign Exchange Market	4	12.12
Cryptocurrency Market	2	6.06
Bond Market	1	3.03
Total	33	100

Journals that address the topic of our interest were retrieved from scientific journal databases namely ScienceDirect and Scopus by keying-in predetermined keywords. The keywords that were used in the search process are presented in Table 2. The first step of this process is to identify which are the journals that publishes articles that are related to our topic. As shown in Table 4, in total we have identified 28 different journals that address the topic of our interest. The journal with the most articles published was *Physica A: Statistical Mechanics and its Applications*, which had six papers (13.33%). *Finance Research Letters* had five papers (11.11%), *Applied Economics* had four papers (8.89%), *Economic Modelling* and *Pacific-Basin Finance Journal* had three papers each (6.67%), and *International Journal of Finance and Economics* had two papers (4.44%). Only one paper (2.22%) was published in each of the other 22 journals. The relevant subject for our study, according to our comprehensive and systematic literature analysis, was the predictability of EPU index on the returns and volatilities of financial markets. This was accomplished by looking at the patterns that had previously been reported in the literature.

Table 4: List of Journals

No.	Name of Journal	No. of papers	(%) of papers
1	Accounting and Finance	1	2.22
2	Applied Economics	4	8.89
3	Economic Modelling	3	6.67
4	Economic Systems	1	2.22
5	Empirical Economics	1	2.22
6	Energy Economics	1	2.22
7	Energy Reports	1	2.22
8	Finance Research Letters	5	11.11
9	Global Finance Journal	1	2.22
10	International Journal of Finance and Economics	2	4.44
11	International Review of Economics and Finance	1	2.22
12	International Review of Financial Analysis	1	2.22
13	Journal of Economic Behaviour and Organization	1	2.22
14	Journal of Financial Economic and Policy	1	2.22
15	Journal of Forecasting	1	2.22
16	Journal of International Development	1	2.22
17	Journal of International Financial Market, Institutions, and Money	1	2.22
18	Journal of Money, Credit, and Banking	1	2.22
19	Journal of Multinational Financial Management	1	2.22

20	Journal of Real Estate Research	1	2.22
21	Macroeconomic Dynamics	1	2.22
22	Open Economics Review	1	2.22
23	Pacific-Basin Finance Journal	3	6.67
24	Physica A: Statistical Mechanics and its Applications	6	13.33
25	Research in International Business and Finance	1	2.22
26	Resources Policy	1	2.22
27	Tourism Economics	1	2.22
28	The Journal of Futures Market	1	2.22

Predicting Ability of EPU Index (Stock Market)

A total of 16 articles in the context of stock markets were examined thoroughly. Four out of 16 papers focused on Chinese stock market. Li *et al*., (2020), studied the predictability of Chinese stock market using global EPU index. The authors finds that the out-of-sample estimate result evidenced that the global EPU index can predict the volatility of the Chinese stock market. Similarly, the study of Yu, *et al*., (2018) which examined the forecasting performance of global EPU index on Chinese stock market concluded that the global EPU index has the predictive power for the volatility of Chinese stock market. Meanwhile the study of Chen *et al*., (2017), examined the predictability of stock market expected return, finds that the EPU predictability is stronger for small-cap stocks. However, the study of Cheng and Shi (2020) were contradicting to the previous findings. Cheng and Shi (2020) examined the predictability of Chinese stock market excess returns using EPU index. Their findings suggest that the EPU index has no forecasting ability of stock market excess return. The authors suggested that the result could be due to bias measure of the EPU index which is based on reports and newspapers from outside of mainland that failed to capture the actual uncertainty caused by Chinese government policy.

Three out of 16 papers which examined the stock markets focused on the European stock markets. The study of Mei *et al*., (2018) studied the predictability of European stock market volatility using various EPU indexes. Their findings show that the European EPU index, which includes the United Kingdom, Germany, and France, does not improve prediction accuracy of the European stock market; however, the US EPU does considerably improve the forecast accuracy of the European stock market volatility. While examining the predictability of the excess stock market return of London Stock Exchange, Junttila and Vataja (2018) finds that the EPU index of US, UK, and Eurozone has significant predicting power on the excess stock market return. According to Ersan *et al*., (2019), EPU is one of the greatest predictors of European Tourism and Leisure industry index (STOXX T&L) return.

Three out of 16 articles which examined the stock markets focused on the US stock markets. The study of Yu and Song (2018) examined the predictability of US stock market volatility by using the global EPU index. The out-of-sample result indicated that the global EPU is able to increase the forecast accuracy of US stock market. Similarly, the study of Liu *et al*., (2017) which examined the S&P 500 index, also found out that, based on the out-of-sample result, EPU could improve the forecasting performance of S&P 500. The study of Antonakakis *et al*., (2016), revealed that EPU can predict the real returns of the US Dow Jones Sustainability Index (DJSI). In this SLR, there is only one paper in the context of Islamic stock market. The study of Ftiti and Hadhri (2019), discovered that the short, medium, and long-term fluctuations of the EPU levels successfully predict future returns of Dow Jones Islamic Markets (DJIM).

A total of five out of 16 papers analysed various stock markets. The study of Balcilar *et al*., (2019), analysed the predictability of three Asian stock market namely Hong Kong, Malaysia, and South Korea using the EPU index. By employing the non-parametric causality-in-quantiles

test, three key conclusions were reached: (1) EPU does not predict Hong Kong stock market, (2) EPU was only able to predict the volatility of Malaysia stock market, and (3) the global EPU was able to predict the stock return of South Korea stock market whilst the domestic EPU was able to predict the volatility of South Korea stock market. The study of Wang *et al*., (2020) analysed the predicting power of EPU index on stock markets during the period of coronavirus. The result of the study revealed that the EPU index can improve the predicting accuracy for Shanghai Composite Index (SSEC), All Ordinaries (AORD), FTSE 100, Hang Seng, and IPC Mexico. The study of Phan *et al*., (2018), finds that the EPU index was not able to predict the stock markets of Brazil, China, France, Netherlands, Russia, and Spain, whilst the global EPU index was not able to predict the stock markets of Australia, Brazil, China, France, Germany, and UK. Contradictorily, the study of Helseth *et al*., (2020) evidenced that high level of EPU effectively predicts stock market returns for Germany, France, UK, and Eurozone. The research of Adjei and Adjei (2017) that analyses the predictability of CRSP index using EPU index, finds that, EPU is a reliable predictor of future market returns in both univariate and bivariate tests.

Predicting Ability of EPU Index (Commodity Market)
A total of 10 articles in the context of commodity markets were scrutinized in this SLR. In the context of oil markets, a total of seven papers were included in this study. The study of Ma *et al*., (2019), examined the forecasting power of EPU for crude oil return volatility and finds that the US EPU index being the best predictor for long-term whilst the China EPU index having the best forecasting performance for short-term. Similarly, the study of Balcilar *et al*., (2016), suggests that EPU have strong predictive power for oil returns, contrariwise, the research of Bonaccolto *et al*., (2018) revealed that the EPU index is not always relevant in forecasting oil market movements. The authors also stated that the EPU index is only relevant during period of market distress. The empirical analysis of Ma *et al*., (2017) which employed the HAR-RV-type models, suggest that, by including EPU index, the forecasting model of oil market becomes more accurate and reliable. The study of Wei *et al*., (2017) analysed the predictability of West Texas Intermediate (WTI) spot oil volatility. The result of the study revealed that both the global EPU index and the US EPU index has superior predictive power. The studies of Liang *et al*., (2020) and Li *et al*., (2020) also revealed that the EPU index and the global EPU index are both equally effective in terms of predicting crude oil market.

In this SLR, there is only one paper in the context of gold commodity. The study of Fang *et al*., (2017) examined the predictability of gold futures market volatility using the global EPU index. By employing the GARCH-MIDAS model, the result of the study shows that the global EPU index significantly predicts the future monthly volatilities for the aggregate global gold futures market. On top of that, the predicting power of global EPU remained stronger in an out-of-sample results. The remaining two papers examined various commodity markets. The study of Bahloul *et al*., (2018) examined the predictability of returns and volatility of 21 different commodity futures using EPU index. By employing the k-th order non-parametric causality-in-quantiles test, the authors concluded that the EPU index successfully predicts the return and/or volatility of 20 commodities futures out of 21 that were examined. The research of Shahzad *et al*., (2017) examined the predictability of six commodities namely gold, oil, palladium, platinum, silver, and titanium using the EPU index. By employing the non-parametric causality-in-quantiles test, the authors finds that the EPU index have some marginal prediction power of the commodities volatilities.

Predicting Ability of EPU Index (Foreign Exchange Market)

A total of four articles in the context of foreign exchange markets were examined thoroughly in this SLR. The study of Christou *et al.*, (2018) examined the predictability of exchange rate returns and realized volatility in 13 different countries using the EPU index. The study employed quantile predictive regression and finds that the EPU index has superior predicting ability in all countries except for South Africa. Similarly, the study of Balcilar *et al.*, (2016), by using the non-parametric causality-in-quantiles test finds that the changes in EPU index has strong forecasting ability for both the return and volatility for four exchange rates namely CNY/USD, MYR/USD, RUB/USD, and EUR/USD. While examining the predictability of exchange rates in the emerging markets, Abid (2020), finds that the EPU index improves the forecasting power of macroeconomic models of exchange rates in different horizon. The research of Zhou *et al.*, (2020) examined the predictability of Chinese exchange rate volatility using the Sino-US EPU ratio. By employing the GARCH-MIDAS model, the authors finds that the Sino-US EPU ratio has a superior predictive power on the Chinese exchange rate volatility.

Predicting Ability of EPU Index (Cryptocurrency Market)

A total of 2 articles in the context of cryptocurrency markets were scrutinized in this SLR. The research paper of Yu (2019) which examined the predictability of Bitcoin (BTC) volatility using the EPU index, finds that, the prediction performance of the benchmark model is significantly enhanced when EPU index is added into the equation. Therefore, the author concluded that the EPU index can predict BTC volatility. Similarly, the study of Liang *et al.*, (2020) also concluded that EPU has significant predicting ability on Bitcoin volatility.

Predicting Ability of EPU Index (Bond Market)

There is only one paper in this SLR that examined the predictability bond market using the EPU index. The study of Ioannidis and Ka (2018), by using a standard predictive regression analysis, the authors finds that the EPU index carries predictive information on future bond returns.

The summary of the articles is provided in Table 5.

Table 5: Summary of Articles

Reference	Model	Country/Sector	Variable	Frequency	Period	Aspect	Focus on	Conclusion
Stock Market								
Li *et al.*, (2020)	GARCH-MIDAS	China	CSI 300, China EPU, and Global EPU	Daily	2005.4.8 – 2017.12.31	Volatility	Predictability	Global EPU able to predict.
Yu *et al.*, (2018)	GARCH-MIDAS	China	SHCOMP and Global EPU	Daily	2001.1.2 – 2016.3.31	Volatility	Predictability	Global EPU able to predict.
Chen *et al.*, (2017)	Predictive Regression	China	Chinese A-Share, risk-free rate, EPU, macroeconomic indicators	Monthly	1996.1 – 2013.12	Return	Predictability	EPU predicts negatively future stock return
Cheng and Shi (2020)	Predictive Regression	China	Chinese A-Share, China EPU, and 24 other macroeconomic variables	Quarterly	1995.Q1 – 2018.Q4	Volatility	Predictability	EPU has no forecast ability
Mei *et al.*, (2018)	Log Realized Variance model	Europe	European Stock Market, EPU of US, UK, France, and Germany	Monthly	1990.1 – 2017.12	Volatility	Predictability	US EPU able to predict European stock market
Junttila and Vataja (2018)	OLS Regression	Europe and UK	EPU of US, UK, and Europe, macroeconomic indicators	Monthly	1997.1 – 2016.9	Return	Predictability	EPU of US, UK, and Europe predicts stock return
Ersan *et al.*, (2019)	OLS Regression	Europe	EPU, global EPU and STOXX T&L	Monthly	1997 - 2016	Return	Predictability	EPU predicts European Tourism and Leisure industry index.

Yu and Song (2018)	Regime Switching	US	Global EPU and S&P 500	Monthly	1997.2 – 2017.11	Volatility	Predictability	Global EPU is able to increase the forecast accuracy.
Liu *et al.*, (2017)	GARCH-type models	US	EPU and S&P 500	Daily	1996.1.2 – 2013.6.24	Volatility	Predictability	EPU can increase the forecast accuracy.
Antonakakis *et al.*, (2016)	Non-parametric causality-in-quantiles test	US	Dow Jones Sustainability Index (DJSI) and EPU, debt-ceiling, financial stress	Monthly	2002.1 – 2014.12	Return	Predictability	EPU predicts DJSI returns
Ftiti and Hadhri (2019)	EEMD and non-linear Granger causality test	Islamic	Dow Jones Islamic Market (DJIM) Indices, investor sentiment, oil price, and EPU	Monthly	2002.1 – 2018.2	Return	Predictability	EPU predicts DJIM returns
Balcilar *et al.*, (2019)	Non-parametric causality-in-quantiles test	Malaysia, Hong Kong, and South Korea	EPU of Malaysia, Hong Kong, South Korea, China, Japan, Europe, US, stock market index	Monthly	1997.1 – 2012.3	Return and Volatility	Predictability	EPU on predict the return and volatility of certain countries
Wang *et al.*, (2020)	HAR-RV-type models	International	19 equity indices, VIX, EPU	Daily	2000.1.3 - 2020.3.26	Volatility	Predictability	EPU improves predicting accuracy.
Phan *et al.*, (2018)	Predictive regression	16 countries that has EPU index	EPU, global EPU and stock market returns of 16 countries.	Monthly	1985.1 – 2016.6	Returns	Predictability	Both EPU and global EPU only able to predict returns for 10 stock market
Helseth *et al.*, (2020)	Predictive Regression	11 countries and Eurozone	EPU and global EPU, 12 stock indices, implied volatility, macroeconomic indicators.	Monthly	2001.1 – 2019.3	Returns	Predictability	EPU predicts stock return of Germany, France, UK, and Eurozone

Adjei and Adjei (2017)	GARCH-M	Switzerland	CRSP, EPU, and RF	Monthly	1985.1 – 2013.12	Return	Predictability	EPU is a reliable predictor for future market return.

Commodity Market

Ma et al., (2017)	HAR-RV-type model	Energy	WTI, US EPU, and China EPU	Daily	2010.1.2 – 2014.4.30	Volatility	Predictability	EPU improve forecasting ability.
Balcilar et al., (2016)	Non-parametric causality-in-quantiles test	Energy	WTI, EPU, and EMU	Daily	1986.1.2 – 2014.12.8	Returns	Predictability	EPU has strong predictive power
Bonaccolto et al., (2018)	Non-parametric causality-in-quantiles test	Energy	WTI, EPU, and EMU	Daily	1986.1.2 – 2015.4.23	Returns and Volatility	Predictability	EPU index is only relevant during periods of market distress.
Ma et al., (2019)	GARCH-MIDAS	Energy	Eight EPU indices and Brent crude oil prices	Monthly	1998.1.1 – 2018.5.31	Return volatility	Predictability	US EPU best predictor for long-term whilst China EPU best predictor for short-term
Wei et al., (2017)	GARCH-MIDAS	Energy	Global oil demand index, oil supply record, oil speculation index, global EPU indices, 6 country specific EPU indices, WTI	Daily and Monthly	1997.1 – 2016.4	Volatility	Predictability	Global EPU and US EPU has superior predictive power
Liang et al., (2020)	Predictive Regression, Elastin, and Lasso	Energy	WTI, Brent crude oil prices, Global EPU, GPR, MPU, EPU, and EMV	Daily and Monthly	1997.1 – 2017.7	Volatility	Predictability	EPU effectively predicts crude oil market
Li et al., (2020)	GARCH-MIDAS	Energy	US EPU, Global EPU, GPR, MPU,	Daily and Monthly	1997.1.2 – 2017.7.31	Volatility	Predictability	EPU effectively predicts crude oil market

			EMV, oil supply, oil demand, oil speculation, interest rate, WTI					
Fang *et al.*, (2017)	GARCH-MIDAS	Precious metal	Global EPU and COMEX gold future price	Daily and Monthly	2001.1.3 – 2017.1.31	Return volatility	Predictability	Global EPU significantly predicts future monthly volatilities.
Bahloul *et al.*, (2018)	k-th order non-parametric causality-in-quantiles test	Agriculture, energy, metals, and livestock	EPU, EMU, VIX, and 21 commodity futures	Daily and monthly	1992.5.8 – 2016.8.31	Returns and volatility	Predictability	EPU predicts 20 out of 21 commodity futures
Shahzad *et al.*, (2017)	Non-parametric causality-in-quantiles test	Industrial metal, precious metal, and energy	Gold, oil, palladium, platinum, silver, titanium, EPU, AAII	Weekly	1996.7.8 – 2016.6.27	Volatility	Predictability	EPU index have some marginal predictive power of the commodities volatilities.

Foreign Exchange Market

Christou *et al.*, (2018)	Predictive quantile regression, QR approach, IVX-QR approach	US dollar-based exchange rates	13 countries exchange rates, EPU	Monthly	1986.9.29 – 2016.11.29	Returns and volatility	Predictability	EPU predicts all exchange rates except for South Africa
Balcilar *et al.*, (2016)	Non-parametric causality-in-quantiles test	Developed and developing markets	16 countries exchange rates, US EPU	Monthly	1999.1 – 2012.3	Returns and volatility	Predictability	US EPU predicts the return and volatility for CNY/USD, MYR/USD, RUB/USD, and EUR/USD
Abid (2020)	ARDL-ECM	Emerging markets	South Korea, India, Brazil, Mexico, Chile, EPU	Monthly	2000.1 – 2016.12	Returns	Predictability	EPU improves forecasting power.

Zhou *et al*., (2020)	GARCH-MIDAS	China	RMB/USD, Sino-US EPU ratio	Daily	2003.1.1 – 2018.9.28	Volatility	Predictability	Sino-US EPU ratio has superior predictive power

Cryptocurrency Market

Yu (2019)	HAR-RV, HAR-CJ	Bitcoin	BTC/USD, EPU	5-minute	2013.3.1 – 2018.9.30	Volatility	Predictability	EPU improves forecasting ability.
Liang *et al*., (2020)	GARCH-MIDAS	Bitcoin	VIX, GVZ, Google Trends, global EPU, GPR, BTC/USD	Daily	2013.1.1 – 2019.8.31	Volatility	Predictability	EPU has significant predicting ability

Bond Market

Ioannidis and Ka (2018)	Predictive regression	US	US EPU, nominal zero-coupon bond yields, interest rate, treasury bond (1, 2, 3, 5, 7,10) years, MacroU, FinU	Daily	1985.1 – 2015.12	Returns	Predictability	EPU carries predictive information on future bond returns

Discussion

In this study, the authors attempted to systematically analyse existing literatures on the predicting ability of EPU index that was developed by Baker *et al*., (2016) on the returns and volatility of financial markets which includes stock market, commodity market, foreign exchange market, cryptocurrency market, and bond market. A total of 12 studies in the context of stock market mentioned that EPU has a superior predictive power whilst a total of three studies partially agreed that EPU predict the return and volatility of certain stock markets. Only one study mention that EPU does not have predictive power (Cheng and Shi, 2020). The authors indicated that EPU could be a bias measure.

In the context of commodity market, a total of nine papers agreed that the EPU index has forecasting power on commodity markets, however, only one paper finds that EPU index is not always relevant in forecasting commodity market and the EPU index seem to be only relevant during periods of market distress (Bonaccolto *et al*., 2018)

In the context of foreign exchange market, cryptocurrency market, and bond market, all the research articles that were examined thoroughly suggest that EPU has significant predicting power on all these markets.

Conclusion

In this study, we used a systematic literature review technique known as PRISMA to analyse selected existing studies conducted from 2016 to 2020 that examined the predicting power of EPU index on financial markets. Our findings show that, more than 90 percent of the articles analysed, concluded that the EPU index has significant predictive power on the return and volatility of financial markets. The findings of this study could be beneficial to investors, fund managers, risk managers, and policy makers since they reveal how the measure of economic policy uncertainty (EPU index) could potentially be used as a tool for forecasting the financial market and in return adding value to portfolio as well as mitigating risk that could harm investments. There are several future research avenues. Future study should investigate the predicting power of EPU on stock market in terms of market value (i.e., small-cap, mid-cap, and large-cap) and into various sectors of the stock market (consumer, industrial, technology etc.). In terms of commodity markets, current studies mainly focused on the energy sectors (crude oil, WTI etc.), therefore, future studies should explore other areas of the commodity markets (industrial, agriculture etc.). In terms of cryptocurrency market, existing studies mainly focused on BTC. In future researchers should consider other cryptocurrencies such as Ethereum (ETH), Ripple (XRP), and several others. Apart from that, future studies can also consider comparing the effects of EPU on Islamic versus conventional financial market instruments, Asian versus European market instruments. Future studies can also look into other uncertainty variables such as Monetary Uncertainty Policy (MPU), Trade Policy Uncertainty (TPU), and World Uncertainty Index (WUI). These could provide more insights on how different types of uncertainty affects the financial markets.

Since this present study is limited to papers published from 2016-2020, the version of the global EPU index used in these papers (Helseth *et al*., 2020; Li *et al*., 2020; Fang *et al*., 2017;) was the first version of the index which records and aggregates the EPU levels of 16 countries whilst the most recent updated 2021 global EPU index captures and aggregates the EPU levels of 21 countries. The new version of the global EPU index contains more information compared to the older version. This is considered as one of the major limitation to this present study. Henceforth, future studies should consider looking into this.

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