Economic Policy Uncertainty and its impact on Stock Price Synchronicity – Cross country analysis

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1. Executive Summary

The purpose of this research paper is to investigate whether and how economic policy uncertainty (EPU) affects the stock price synchronicity (SYNCH) and empirically validate a model to explain the this correlation. In this study, economic policy uncertainty is considered the main independent variable and is believed to have an impact on the dependent variable, stock price synchronicity. The model also describes the individual effects of firms-specific and country-specific control variables that are believed to have significant differences that need to be controlled for. The proposed model was tested by collecting data for the sample of 71082 observations during 2010-2019 from different industries such as “Basic Materials”, “Consumer Cyclicals”, “Energy”, “Healthcare”, “Real Estate”, “Industrials”, “Technology” and “Utilities” in 20 countries in which the EPU index is applicable to. Pooled OLS regression model analysis was performed for identifying the correlation between the variables and their significance by using a statistical tool, STATA 13.0. The proposed model was found to predict that the economic policy uncertainty (EPU) has a negative impact on the stock price synchronicity (SYNCH), with statistical significance (p-value ~ 0, t-value of -35.91). While some control variables such as dividend yield, loss-making, GDP, legal authority reinforces the negative impact of EPU on SYNCH, some other control variables such as size, market to book ratio, leverage and press freedom attenuate the negative effect of EPU on stock price synchronicity. The results obtained from this study will help the researchers and practitioners to be able to analyze understand and analyze the correlation between the EPU and SYNCH.

2. Introduction

Today, the uncertainty caused by the changing lifestyle and complexity with the effect of technology and globalization also manifests itself in policies related to economic decisions and can be especially effective on the financial policies of companies (Al-Thaqeb and Algharabali,

2019). In this respect, uncertainty can negatively affect economic performance by causing companies to act with a "wait and see" strategy before making investment decisions, and by increasing the borrowing costs of businesses and consumers.

On the other hand, the concept of economic policy uncertainty, which is seen as an important risk factor (Brogaard & Detzel, 2015), arises as a result of the policy makers' failure to achieve a common consensus or the lack of stability in economic policies, and may cause the stock market to crash by damaging the economic recovery (Dakhlaoui and Aloui, 2016). In other words, the uncertainty in the decisions of the economic policy makers affects the decisions of economic units on many issues such as consumption, investment, savings, lending, and the whole economy can be negatively affected by the uncertainty in policies (Wu et al. 2016).

One of the first studies on measuring uncertainty, which has a very important effect on the entire economy, is the Economic Policy Uncertainty Index (EPU) developed for the USA by Baker, Bloom and Davis (2012). This index is one or more such indexes for the USA as "national assembly", "budget deficit", "central bank", "legislation", "regulation", two of which are "economy" and "uncertainty" mentioned in the articles in 10 of the leading newspapers of the USA. It has been created monthly since 1985 to reflect the frequency of a triple term consisting of more words. Later, Baker et al. (2016) created the economic uncertainty index for 11 countries (Australia, Brazil, Canada, France, Germany, India, Italy, Mexico, South Korea, Russia and the United Kingdom) in addition to the USA, using a method similar to the study in 2013.

To explain, economic policy uncertainty is the economic risk associated with undefined future government policies and regulatory frameworks. It differs from basic macroeconomic variables and its scope is broader which includes the uncertainty about next monetary or fiscal policies, tax and regulatory framework, as well as uncertainty that influences political leadership (Baker S., 2016). Below it shows a trend of increase in policies' uncertainty over the recent years:

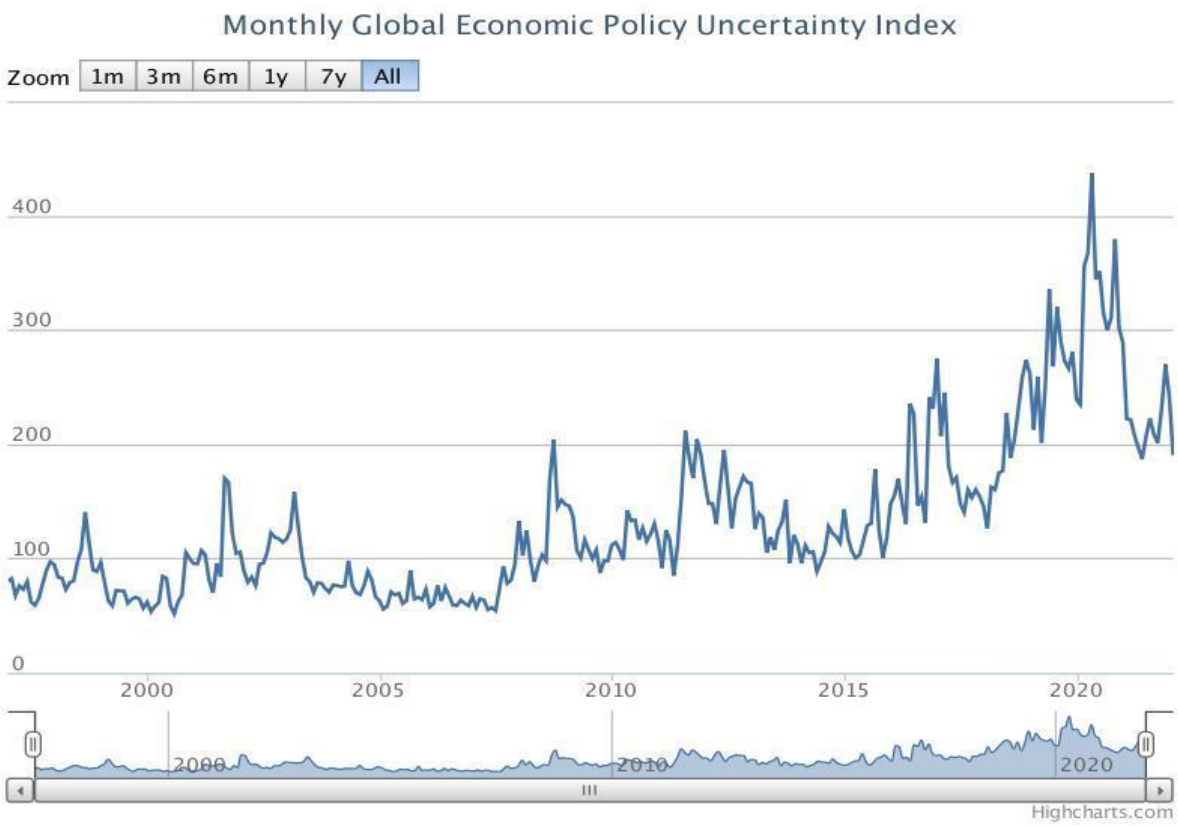


Figure 1:Monthly Global Economic Policy Uncertainty Index

Figure shows that the level of economic policy uncertainty is at high levels compared to history because of the global economic downturn and a strong dynamic correlation between EPU and macroeconomic variables has been proved by many studies. Adding to this idea, economic policies all over the world create huge amounts of uncertainties regarding the nature of policy decision-making and its implementation (Zhang, Han, Pan, & Huang, 2015). The Economic Policy Uncertainty (EPU) Index developed by the Baker (2016) has been at the center of attention and the index is being used in almost 90% of the literature developed regarding the correlation or the impact of EPU on some microeconomic and macroeconomic variables. This phenomenon has been at the point of convergence for many years and a lot of research has been conducted for its diverse effects under diverse circumstances. The effects of economic policy uncertainty can be defined in different ways; its effects on the corporation, its impact on the market, industry and individuals.

The effect of economic policy uncertainty raises concerns not only for governments, but also for the scholars and companies (Shen, Y., 2020). Although there are not many studies that have been conducted on measuring the reaction of individual firms' stocks to the uncertainties happening in the world, country or specifically in an industry, one of the leading topics is focused on the relation of firms' stock returns with the market return nowadays. Stock Price Synchronicity (SYNCH) identifies itself as an idiosyncratic phenomenon of "rising and falling together", reaction of a firm stock return on market return or industry average returns and this occurrence exists almost in every capital market all over the world (Chan, K., 2013). Higher synchronization implies more information that is incorporated into stock prices, while lower synchronicity reflects the lack of informativeness. According to a recent study, price informativeness and stock price synchronization have a positive relationship. In other words, markets with lower idiosyncratic volatility (higher synchrony) are more informative which makes it crucial to understand the information content of synchronicity (Farooq O., and Ahmed S., 2014).

There are several reasons why studying synchronicity is an important phenomenon. According to Morck, Shleifer, and Vishny (1989), a declining firm-specific stock market performance might lead to the CEO's dismissal by the board. Moreover, as Durnev, Morck, and Yeung (2004) point out, when there is high synchronicity, returns become more efficient in anticipating the changes in future earnings. As a result, synchronicity can be seen as a predictor of stock price "information content" (Collins, Kothari, & Rayburn, 1987). For this reason, it is crucial for companies to identify the root causes of the inefficiencies in their stock returns and keep track of the changes and circumstances in the overall market or industry. In other words, when the stock price synchronicity is low in a specific firm, it means that the stock market efficiency of a firm is under the threshold. This, in turn, affects the firm's investment efficiency and financial performance. Some scholarly articles prove that Stock Price Synchronicity is

dependent on some influencing factors such as the information environment of a firm. To elaborate, to what extent firm-specific information such as the investment or financing decisions is incorporated with the stock price, is an important factor that synchronicity depends upon (Gul, F.A., 2010).

Since Economic Policy Uncertainty is a crucial factor affecting the several factors of a firm environment, it can indirectly affect the Stock Price Synchronicity of a particular firm. For the purpose of this study, this paper investigates whether and how the Economic Policy Uncertainty affects the Stock Price Synchronicity through information environment, agency problems, and other related factors.

2.1. Problem Statement and Research Questions

The financial crisis that emerged in the United States of America and later gained a global dimension caused stagnation and contraction in the economy. It is stated that one of the reasons behind the prolonged stagnation in the economy and the inability to get out of the recession is the uncertainty in the arrangements that policy makers will make regarding the budget, bailout packages and reforms. It is argued that the economy is damaged due to the expiration of the Bush-era tax cuts, the debate about the upper debt limit, and the US government's suspension of all non-essential federal services in 2013 and policy uncertainty in the implementation of these policies (Johannsen, 2014). Uncertainty in economics still maintains its place as a controversial concept despite all the theoretical developments. The factor behind the discussion of uncertainty so much is not that the semantic criteria of the concept of uncertainty in abstract economic thought cannot be conceptualized, but that there is no consensus on the concept of uncertainty. The lack of a consensus on uncertainty has led to the emergence of different approaches regarding this concept. In other words, the negative effects of economic policy uncertainties on firm-level decisions/behaviors necessitates comprehensive research to be conducted in this manner.

The identified gaps regarding the discussed topic in the current literature is that only 1 study has been conducted on the 2-sided correlation: Economic Policy Uncertainty & Stock Price Synchronicity. This study is conducted by Shen H., Xiong H. (2020) and it focuses on investigating the impact of Economic Policy Uncertainty on Stock Price Synchronicity based on the sample of firms between years 2007-2017 in China. After including more than 20,000 observations in the panel-data regression model, the results reveal the negative effect of EPU on stock price synchronicity. Particularly, the current gap with the existing literature is that it has been focused on one country (China) and almost 5 years passed from the collected data of the chosen years (2007-2017) which is a significant amount of time for a study to change its direction. Some other gaps regarding the reviewed literature include the repeated models in research papers, analysis of a specific country and some defined variables that lead to confusion and information overload. This paper will contribute to the existing literature with several factors. Firstly, this study will investigate the influence of EPU on SYNCH differently from previous literature which were mainly focused on studying the impact of EPU on firm-level decisions such as capital structure, cash holdings, market returns and investment performances. In other words, this study will reveal the correlation between EPU and SYNCH considering also the country-specific characteristics, by integrating alternate measures and Robustness checks to identify the real impact. Moreover, this paper will study the influence of EPU on synchronicity which will fill the gaps within the existing literature and add a more comprehensive approach regarding the impact of EPU by including the countries (over 20) that EPU index is applicable to. In addition, the study will be conducted by taking the recent years into account which will enrich the existing literature by the ability to perceive the recent happenings in the world. Since more countries that are available within the EPU index measures are included in the study, the broader perspective to be able to analyze the topic will be revealed.

There are several factors such as excess cash holdings of firms, investment delays and precautionary motives which explain the impact of EPU on firm-level characteristics and behaviors and so many theories have been formulated to explain this phenomenon within the capital structure of firms like trade-off or pecking order theory. Main research problem discussed here is about the negative impact of EPU on firms' information environment and how these events affect the informativeness of stock prices, measured as Stock Price Synchronicity (SYNCH). For the purpose of this study, the causes make SYNCH to increase/decrease as a result of disclosing more/less and false information, and the effect of economic policy uncertainty on these factors will be examined to get a clearer picture of the 2-sided correlation. The research question developed for the purpose of this study are as follows:

Q1: To what extent and how Economic Policy Uncertainty (EPU) affects the Stock Price Synchronicity (SYNCH) of firms?

3. Literature Review

3.1. Stock Price

The main definitions in the concept of stock price are nominal (nominal) price, issue (emission) price, market price and stock market price. The value written on the stock shows the nominal value (price) of the stock. It is the value given by the company management during the issuance of the stock. The nominal value is used to determine the amount of the total capital, to make the accounting records of the capital and to calculate the dividend per share (Zolotoy et al, 2017).

The issue price is the price at which the shares are offered for sale by the company at the time of issue. In general, companies in Azerbaijan sell their newly issued shares at a nominal price, but the company issuing the shares with a high stock market value can also set an emission price above the nominal value. The emission price is determined above the normal price, especially in the public offering of the portion remaining after the exercise of the preemptive

right in a new capital increase (Abdul, 2007). Some companies, on the other hand, prefer to establish the price in the stock market by presenting the surplus section directly to the stock exchange at a limited price (the seller sets the lowest price on the selling slip).

The price at which a share is bought and sold in the capital market is defined as the market price of that share. It is formed according to supply and demand conditions. Without any change in the efficiency of the business, depending on the changes in market conditions, changes in the market price of a share may be observed over time, a price above or below its real value. If there is a stock market; It is the price used synonymously with the stock market price.

The stock market price is the price of the stocks that have started to be traded in the stock market, which is formed according to the supply and demand conditions in the stock market. Prices are determined daily according to the functioning of the stock market and are divided into types such as opening, closing, lowest, highest, average daily price (Fressard and Foccault, 2014).

3.1.1. Factors Affecting Stock Price

As in every market, the market (stock market) price in the stock market is determined by the supply and demand of stocks. However, in the stock market, the supply and demand that creates the stock price are under the influence of many factors out of account. These factors can be psychological or speculative and these factors can be divided into external factors (macro factors) and internal factors (micro factors) (Rahman et al., 2011).

3.1.2. Macro Factors

There are many studies investigating the relationship between basic macroeconomic variables and stock prices. In finance literature, the price of a stock is the discounted value of the future cash flows of that stock. Any change in expected cash flows or discount rate will affect the price of the stock (Puja and Kumar, 2012). The discount rate or expected cash flows are a

function of macroeconomic variables such as market interest rate, inflation, risk premium, industrial production, and exchange rate. Therefore, macroeconomic variables can be expected to affect the stock price.

Since earnings and dividend incomes depend on the future situation of macroeconomic variables, it is an inevitable result that stock prices fluctuate by being affected by macroeconomic variables.

The main factors that are related to the general economy and need to be analyzed are as follows (Sharma et al., 2010);

- The monetary policy of the government, the monetary program of the Treasury and the Central Bank,
- Public expenditures and budget deficits,
- Increases in emission volume, inflation rate,
- Foreign trade and balance of payments deficits,
- Movements in exchange rates, inflation-devaluation relationship,
- The general trend in gold prices,
- Treasury bill and repo rates, auctions,
- Interbank interest,
- Investments, employment policy and unemployment rate,
- Gross national product (GNP) increase (growth rate),
- Privatization policy and practices.

3.1.3. Micro Factors

Factors such as the financial structure of the issuing company and its profitability status affect the market price of the stock. In order to analyze the company and its activities in question, it is necessary to focus on the following factors (Trimbia et al., 2014):

- The title of the company, its owners, the group or holding, its past and reputation,

- Its capital, reserves, whether it is in the registered capital system, its main shareholders with management responsibility,
- Number of personnel, employee-employer relations, character of the union, strikes in the past, closeness of the collective agreement date, strike probability,
- Managers' identity, abilities,
- Subject of production, feature of the product, production capacity, elasticity of demand of the product, increase in production over the years, production and market share in the sector,
- Production costs, efficiency and profitability compared to its competitors,
- Foreign dependency, stock obligation and policy in raw materials and semi-finished products,
- The amount of exports, its share in the sector's exports, new export opportunities, competitiveness in foreign markets, export growth over the years,
- Incentives, patent and name rights,
- Credit opportunities, use of credit,
- Expansion or new investment projects, capital increase opportunities and possibilities,
- Revaluation fund,
- Dividend distribution and distribution policy over the years,
- Subsidiaries, surplus land and other real estates

Capital increase and the use of pre-emptive rights have an increasing effect on stock prices. When it is heard that a company will increase its capital, prices tend to increase in the market due to the preemptive rights to be used (Al Shubiri, 2010). Because, after the decision to increase is finalized, there is no significant difference between selling the stocks when the price peaks, or not selling and exercising the right of preference. For this reason, speculators usually sell their holdings at this point.

Although capital increase in profitable companies is an event that adds value, when the capital increase is completed and new shares belonging to the new capital are distributed, the prices of the stocks of that company decrease to some extent. Because the circulation of new stocks after the capital increase means that the stocks of that company become abundant in the market. In addition, those who participate in the capital increase and want to sell all or part of the new shares and wait for their distribution will take action immediately. In order for the newly issued shares to affect the share price, the amount of shares held by the estuary must be small, and the newly issued shares must be significant compared to the amount of shares outstanding. The observed price drop loses its effect after a short time and the supply-demand balance re-establishes (Ghozali et al., 2021).

The amount of dividends that the company has distributed in the past and that it is expected to distribute in the future also affects the stock prices. As it is known, the real price of stocks is determined by the earnings of the stock and the earnings of the stock depend on the capital gains and dividends. Therefore, the dividend rates that companies have distributed in the past and the expectations about the dividend they may distribute in the future move the stock prices up or down. Any company's decision to pay dividends at a high rate or the expectation that it will pay high dividends due to positive developments in the industry rapidly increases the stock prices of the company. Hearing that a company that has not turned into a profit since its establishment or has been in a loss for a few years even though it has been profitable before, is heard that it is profitable again, immediately increases the stock prices of the company (Shin, 2013).

If the stock market price bulletins are examined, it will be observed that the stocks of companies that distribute dividends at the same rate or that are expected to distribute in the future are traded at different prices. The reasons for this can be listed as follows (Huy and Hang, 2021);

- Strong Institutions: The stocks of companies that have been operating for years, are almost unrivaled in their field, have proven their success in their field, and distribute dividends continuously every year and always at an increasing rate are more valuable than others.
- Dividend Policy: Companies that follow a high dividend policy towards their partners, always distribute most of their earnings to their partners, and apply to their partners through capital increase when new funds are needed, are the most sought-after corporations. This policy is advantageous for the shareholders both in terms of maximum dividend distribution and profitable in terms of high value increase in stocks with frequent capital increases.
- Balance Sheet Profit: Even though it distributes dividends at the same rate, the stocks of the company with higher balance sheet profit will gain more value. Because the fact that the balance sheet profit is high indicates that it can distribute more profit in the following years.
- Value of Assets: Among companies that show the same characteristics in all respects, the stocks of the company with the higher accounting value of the asset are more valuable than the stocks of other companies.
- Liquidity of Stocks: The purpose of the stock buyer is generally to make a "medium or long-term investment". However, some buyers, while making such an investment, also wish to be able to turn their current value into cash without excessive loss in case of an urgent need. a wide variety of securities are in circulation. In these markets, supply and demand also meet on the stock exchanges without the intervention of a third party. Therefore, there is no theoretical difference between the buying and selling prices. The buyer who converts the value he bought into money on the same day and in the same stock market is only called stock market abortion. loses the money paid in. Stocks have

different liquidity possibilities when money is needed. Therefore, even under equal conditions, the prices of stocks may differ.

3.2. Stock Price Synchronicity (SYNCH)

A great amount of focus has been given to the information flow across the securities in the previous literature (Sias and Starks, 1997; Brennan et al., 1993; Chordia and Swaminathan, 2000). The majority of this literature attributes information transmission across securities to a firm's information environment. For example, Badrinath et al. (1995) shows that knowledge flows from institutional investors to other enterprises. They claim that firms have a superior information environment due to lower information setup costs and legal limits imposed by prudential rules. Due to these factors, institutional investors must focus on a restricted number of stocks. As a result, they can better obtain and evaluate valuable data. Therefore, firms with substantial institutional ownership should have superior information environments.

The degree to which stock prices move in lockstep with the market is called synchronicity. A lack of CG mechanisms has been previously described and insiders own and control most enterprises in emerging markets, according to Farooq and El Kacemi (2011). In emerging markets, the largest shareholder is generally the board chairman, as shown by Balasubramanian et al. (2010). Inefficient regulatory authorities, insufficient enforcement of investor protection legislation, and family control are cited as reasons for ineffective CG mechanisms in certain markets (Khwaja and Mian, 2006; Claessens and Fan, 2003). Weak governance procedures also prevent the development of a culture of openness in these markets. Leuz et al. (2003) show that in emerging markets, managers and controlling owners hide information about their enterprises. According to previous research, stock price synchronicity is becoming a more important feature of a company's governance framework. Those with superior governance procedures have more synchronicity than companies with bad governance mechanisms. Inclusion in the S&P 500 index, for example, boosts stock price synchronicity, according to

Barberis et al. (2005). Chan and Hameed (2006) found that strong stock price synchronicity is associated with analyst following, a proxy for a firm's governance environment. Low stock price synchronicity, according to Farooq and Ahmed (2015), suggests inadequate governance and information environment.

Better governance, according to Dasgupta et al. (2010), leads to higher stock price synchronicity because it enhances investors' predicting capacity. They point out that improving the governance environment improves the accuracy of projections made by investors regarding future firm-specific occurrences. Since stock prices only react to unexpected occurrences, accurate projections improve the possibility that current stock prices have already factored in future events. As a result, when events occur, prices do not respond strongly to the news. In other words, present stock prices that are more informational (due to a stronger governance environment) should be related with future stock price variance that is less firm-specific. Stock prices with less firm-specific variance have a better connection with market returns, resulting in high stock price synchronicity.

As a firm's information environment improves, Dasgupta et al. (2010)'s arguments should be more important for investors with the abilities and sophistication to make accurate projections. Investors lacking these skills may not reap the benefits of improved information environments. To make the greatest use of available information, we suggest that individual investors lack skills. As a firm's information environment improves, institutional investors are usually the ones who can make accurate forecasts. Firms with high synchronization are likely to have significant institutional ownership. Kelly (2007) finds that enterprises with high synchronization have dominant institutional ownership.

Moreover, stock price synchronicity is influenced by the ownership structure. It is first demonstrated that institutional trading may speed up the assimilation of firm-specific data. However, it has been demonstrated that stock price synchronicity is positively correlated to

firm ownership by transient institutional investors but is negatively correlated to firm ownership by dedicated institutional investors, because transient institutional investors prefer to arbitrage while dedicated institutional investors prefer to monitor (Chan et al, 2013). According to Velury and Jenkins (2006), institutional ownership is linked to higher profits quality. Jung and Kwon (2002) demonstrate that earnings informativeness increases with institutional holdings. This literature suggests that institutional investors can collect and process more public and private information and institutional investors are regarded to be better monitors due to their improved capacity to obtain and understand data. The largest shareholder has an inverted U-shaped relationship with synchronicity, according to the evidence. Stock price synchronicity rises with excess control and declines when major shareholders own a high percentage of cash flow rights, according to the findings.

Following Roll's pioneering study, the burgeoning literature on synchronicity is divided into three categories. The first is the link between stock returns and synchronicity, or the idiosyncratic volatility conundrum. Previous research has linked equities with high idiosyncratic risk to low average returns. This conclusion contradicts the classic asset pricing model's prediction of either positive or negative correlation. Many economists then attempt to explain this perplexing result: The negative relationship between realized idiosyncratic volatility and stock returns vanishes if return reversal is controlled, and the relationship becomes positive when conditional idiosyncratic volatility is assessed using the EGARCH model. Incomplete information is also shown to have a role in the negative idiosyncratic risk premium. Furthermore, using a GMM-type estimate approach, the idiosyncratic risk premium is favorably connected with daily stock returns and negatively correlated with monthly, quarterly, and yearly stock returns. Other explanations include human capital, leverage, stock market listing and liquidity, business information disclosure, public news arrival, and so on.

Moreover, Jin and Myers (2006) developed a model in which managers suppress adverse news, causing a stock price drop. To explain, managers must pay enough dividends to investors to avoid termination at the end of the fiscal year and they may suppress unfavorable news until the dividend payout fulfills investor expectations as a result of agency problems. When bad news accumulates to a certain level, managers stop hiding it and release it all and causing stock price synchronicity to drop. Jin and Myers (2006) found that countries with greater information transparency have lower crash risks and higher stock price synchronicity.

In general, there are three approaches to gauge stock price synchronicity. The first is the residual standard deviation from the Fama-French three-factor asset pricing model. The second measure is likewise based on Fama-French three-factor regression, but the conditional idiosyncratic volatility is calculated using an EGARCH model. Another model is more traditional way that is constructed by Morck et al. (2000) which explains the stock return and market index return. This model is chosen to be more appropriate and used in this study rather than the first two metrics which are commonly employed in studies of the relationship between stock returns and idiosyncratic volatility since they are derived from asset pricing models.

3.3. Economic Policy Uncertainty (EPU)

The concept of uncertainty gained an economic content with the analysis of entrepreneurship in Cantillon's work "Essai sur la Nature du Commerce en Général", which he also wrote in the 1730s. Cantillon classified economic actors into three groups: landowners, workers and entrepreneurs. Landowners are financially independent and are the main consumers in the economy. Workers are guaranteed a stable income by working on a contract basis. The motivation of entrepreneurs responsible for production, distribution and exchange of goods is the hope of making profit by arbitrage (Hebert and Link, 2006). The market is surrounded by uncertainty rather than perfect information and certainty (Rothbard, 2006).

Later, Adam Smith gave wide coverage to the concept of uncertainty in his work titled “The Wealth of Nations”, which he wrote in 1779, and included uncertainty in the decision-making mechanism. Smith associated uncertainty not only with the quantity of information, but also with its quality. For Smith, uncertainty is related to the quality of the knowledge base from which probabilities are calculated (Brady 2016).

Knight, in his work "Risk, Uncertainty and Profit" written in 1921, revealed the differences between risk and uncertainty. According to Knight, who describes risk as measurable and insurable uncertainty, uncertainty is immeasurable. Knight (1921) based the differences between risk and uncertainty on probability assessment, which he divided into three groups: a priori, statistical, and estimation. Prior probability is based on past experiments and can be calculated mathematically. The probability of rolling a certain number when a dice is rolled is one of the most well-known examples of a priori probability. Statistical probability is based on grouping of events and results are not homogeneous. Knight gave the example that an insurance company can evaluate the probability of a fire in a particular building through statistical research.

If events are heterogeneous and grouping is not possible, only guesswork can be made. In this case, we are faced with “real uncertainty” and judgment is made in order to create an estimate. Researching the structure of business and profit, Knight took an interest in forecasting probability. Knight is of the opinion that businessmen who are faced with real uncertainty have to base their decisions on subjective judgments and that success depends on the difference between the result expected by the entrepreneur and the actual result (Svetlova & Fiedler, 2011). An important contribution of Knight is that uncertainty creates an opportunity to make a profit, while in the case of risk, it is not possible to make a profit.

Keynes, who worked on uncertainty at the same time as Knight, brought a philosophical perspective to the issue of uncertainty with his work titled "A Study on Probability" and argued

that probability should be thought through logic and Keynes' probability approach generally focuses on subjectivism. Keynes, who is of the opinion that entrepreneurs cannot form rational expectations due to the lack of information and the general uncertainty of the future, therefore stated that their decisions are based on conventional judgment with the assumption that the future is similar to the past.

With the rational expectations hypothesis, which was first put forward by John Muth and later included in macroeconomics by Robert Lucas, the concept of uncertainty of Knight and Keynes turned into measurable risk under the leadership of the neoclassicals. According to those who support the rational expectations view, individuals use the available information wisely in a way that does not create systematic errors, and uncertainty is numerically definite probability information. As a result, as shown in Table 1.1, Keynes is grouped as immeasurable-subjective, Knight immeasurable-objective, Savage measurable-subjective, Muth and Lucas measurable-objective according to the concept of uncertainty and probability understanding.

	Probability is a property of knowledge or belief.	Probability is the property of knowledge in relation to external reality.
Uncertainty refers to a situation that can be measured as probability.	subjectivists (Savage)	rational expectations view (Muth and Lucas)
Uncertainty refers to a situation that cannot be measured as probability.	Keynes	Knight

Table 1. Concepts of Uncertainty and Probability

3.3.1. Uncertainty Measures After the 2008/2009 Global Financial Crisis

Interest in the concept of uncertainty has decreased since the 1950s, with the intense use of mathematical models in economics. In this process, the uncertainty that Knight and Keynes defined as an immeasurable concept was either ignored or interpreted in a measurable way. With the 2008/2009 global crisis, the concept of uncertainty came to the fore again. In addition

to the uncertainty of the policies for the resolution of the crisis, the changes in the structure of the economy with the effect of the crisis increased the uncertainty and limited the economic recovery. The most important factor putting downward pressure on the global economy has been the uncertainty about whether policy makers in developed countries will be able to keep their promises (Lagarde, 2012).

Due to the immeasurable nature of uncertainty, many proxies have been used in the studies conducted after the global financial crisis. In this framework, uncertainty measures can be grouped into four main groups:

3.3.2. Measures Based on Volatility of Economic and Financial Indicators

One of the most common approaches is to use the volatility of economic and financial indicators as a proxy. The preference for these volatilities can be explained by three main reasons. First, periods of high financial volatility, such as the Asian crisis and the collapse of Lehman Brothers, are generally characterized as “uncertain” because they contain "unknown unknowns". Second, greater attention is paid to news and new information in times of uncertainty, which triggers higher transaction volume and increased volatility in financial markets. Third, uncertainty measures obtained from financial markets are high-frequency and easily accessible. In this way, uncertainty shocks can be caught immediately and make it possible to give a quick policy response. However, it is also criticized that the said proxies reflect the conditions in only certain parts of the economy, not in general. Among those who use the volatility of economic and financial indicators as an uncertainty proxy are Leahy and Whited (1996), Bloom (2009), Basu and Bundick (2012), Bloom et al. (2013), Caggiano et al. (2014), Leduc and Liu (2015), Popp and Zhang (2015), and Knotek II and Khan (2011). In addition, GARCH models were also used to obtain the variance series (Asteriou and Price, 2005; Berument et al., 2007; Bloom et al., 2014; Yıldırım and Alkan, 2018).

3.3.3. Survey-Based Criteria

Another popular approach is survey-based metrics that show the perceived uncertainty of economic actors. In this group, uncertainty causes expectation mismatch (Baker et al., 2013; Bloom et al., 2014; and Bachman et al. 2013), expectation errors (Bachmann et al., 2013; Arslan et al., 2011; Rossi & Sekhposyan, 2015) and direct uncertainty to uncertainty. It is measured through survey questions that refer to it (Leduc & Liu, 2015). The expectation discrepancy expresses the distribution (variance or standard deviation) of the estimates, the greater the distribution of the estimates, the higher the disagreement among the respondents. It is argued that the variation in the forecasts of economic actors reflects the uncertainty regarding the future of the economy. Expectation errors, on the other hand, are obtained from the variance of the difference between forecasts and realizations, and can be determined after the data are disclosed, not while the forecasts are being created (Orlik and Veldkamp, 2014). It is assumed that the lower the precision of the estimates, the higher the uncertainty (Abel et al., 2016).

Survey-based measures have the advantage of not involving econometric models and are very useful in demonstrating uncertainty in the business world, as they directly reflect decision makers' thoughts on uncertainty. However, these criteria also have some shortcomings. Some surveys are done infrequently, so it may not be possible to catch the uncertainty immediately. Survey data are available for a limited number of series, and it may not be possible to make a comparative country analysis because the surveys are not the same across countries. If all respondents make similar predictions, the mismatch (distribution) of the estimates may not reflect uncertainty, even if each of them is of the opinion that the future is rather uncertain. The cyclical characteristics of the companies regarding the activity may differ, so the estimation mismatch may not be related to the uncertainty. Respondents to the survey may not want to deviate much from the consensus estimate in order to protect their reputation, in this case they may not fully reflect their views on the future (Dzielinski, 2012)

3.3.4. Economic Policy Uncertainty Indices (News-Based Indices)

Economic policy uncertainty indices were also among the uncertainty measures frequently used especially after the global crisis. These indices were created with the thought that they reflect the uncertainties about policy steps and their effects (Baker et al., 2013; Alexopolous and Cohen, 2009). Baker et al. The index of economic policy uncertainty put forward by (2013) consists of 3 main components: i) frequency of use of keywords emphasizing economic policy uncertainty in newspaper articles, ii) number of tax regulations that will expire, and iii) expectations regarding inflation and federal and local government expenditures. obtained using the inconsistency. These components were normalized with a standard deviation of 1 and their weights in the overall index were determined as 1/2, 1/6 and 1/3, respectively. In the general index, the first 25 years (1985-2009) of the period covered by the data are normalized to an average of 100. The index includes presidential elections, wars, contentious budget wars, important policy decisions made during and after the global crisis, etc. showed rapid increases over the years. For example, the average index value was 71 in 2006 (the year before the global financial crisis) and 173 in 2011.

Indices showing economic policy uncertainty provide a broad scope of potential sources of uncertainty, contributing to a better assessment of different potential impacts, but they also have some disadvantages. Firstly, the news-based component of the criteria is an indirect measure and raises questions about the sensitivity of the results to the selected words, since they are based on a limited number of keywords (Alexopoulos & Cohen, 2015). It is not clear whether the chosen words fully reflect expectations about the future state of the economy. Dzielinski (2012) states that the said criteria most optimistically reflect the view of individual and less sophisticated investors. Secondly, many tax regulations are renewed regularly and thus do not constitute a source of uncertainty (IMF, 2013). Third, the estimation mismatch component may increase due not only to policy uncertainty but also to the impact of other

factors. Finally, changing the weights for components rather than keeping them constant over time can provide better detection of policy uncertainty.

3.3.5. Criteria Established by Principal Component Analysis (PCA)

Another method frequently used in the creation of the uncertainty criterion is principal component analysis, a statistical technique that was initiated by Pearson in 1901 and developed by Hotelling in 1933. PCA is a technique for measuring the covariance of a set of indicators. PCA is a way of detecting patterns in a data set and displaying data in a way that highlights similarities and differences (Smith, 2002). PCA is a linear transformation technique that allows to reduce the dimensions of the data set containing interrelated variables, by preserving the existing changes in the data as much as possible and revealing the hidden structures. The variables obtained after the transformation are considered as the principal components of the original variables. The first principal component has the largest variance value, and the subsequent principal components are ordered in descending order of variance values. Abdi and Williams (2010) summarized the objectives of PCA as reducing the size of the data set by preserving important information, obtaining the most important information from the data set, describing the data set more simply and analyzing the structure of the variables.

If there is no correlation between the original variables, there is no point in applying PCA. If the correlation between the original variables is high (plus or minus), a significant dimension reduction can be achieved. ECB (2013), Hadow and Hare (2013), IMF (2012), Creal and Wu (2014), and Jurado et al. (2015) created uncertainty measures with PCA. The ECB (2013) applied TBA to the indicators gathered in three groups. These are: i) survey-based uncertainty indicators, ii) indicators obtained from financial markets that indicate risk perception, and iii) indicators of economic policy uncertainty. Similarly, Hadow and Hare (2013) obtained a summary measure of uncertainty for England using 7 uncertainty indicators. These indicators are: equity implicit volatility, exchange rate implicit volatility, forecast mismatch of corporate

earnings, mismatch of growth forecasts, unemployment rate expectations, CBI demand uncertainty limiting investment, number of references to economic uncertainty in articles. The IMF (2012), on the other hand, focused on macroeconomic uncertainty and estimated global uncertainty through the dynamic common factor of the standard deviation of the stock series of France, Italy, Germany, Japan, England and America.

3.3.6. Impact of Economic Policy Uncertainty

The problem of Economic Policy Uncertainty has been the center of discussions for financial economists. Economic entities change their behavior and decisions when they confront those economic uncertainties. Uncertainty in economic policy is ambiguity in external information and uncertainty causes information asymmetry between company management and information users. Gladyson B., Patricia B. (2015) conducted a study regarding the impact of financial constraints the companies face and its impact on the accounting conservatism. Conservatism is an attribute of accounting information quality, according to Dechow, Ge, and Schrand (2010); Holthausen and Watts (2001) and Watts (2003) find a positive association between conservatism and accounting information quality in their research. According to the authors, conservatism limits managers' potential for opportunistic behavior, making this method an effective tool for reaching agreements. Sunder (1997) claims that accounting plays a significant informative function in mitigating problems related to information asymmetry in this manner. According to Watts (2003), company stakeholders prefer accounting conservatism because “it reduces opportunistic earnings by management, reduces information asymmetry and conflicts of interest between the company and investors, facilitates debt renegotiation, and keeps the company from going bankrupt to solve financial problems”. The study Gladyson B., Patricia B. (2015) investigated a sample of over 1000 observations from Brazilian publicly traded companies. The results show that financially constrained businesses use less conditional conservatism in their accounting statements, according to the findings. In other words, those

companies avoid disclosing losses in order to gain access to more external funding, resulting in increased information asymmetry. Since EPU has a significant impact on financial constraints the firms face, companies with high financial constraints are more prone to disclose wrong information which, in turn, results in information asymmetry. As a result of information asymmetry, firms tend to disclose less information to the market which, in turn, reduces the informativeness of stock prices. More literature regarding the impact of EPU stock markets and firms are as below:

- Sum (2013) analyzed the effects of changes in economic policy uncertainty for the USA on the returns in ASEAN (Indonesia, Malaysia, Philippines, Singapore and Thailand) stock markets for the period February 1985-February 2012. The study findings imply that the performance of the ASEAN stock market is connected to economic policy circumstances and the stock market in the United States. The data suggests that ASEAN stock market players are aware of US economic policy situations
- Ko and Lee (2015) analyzed the relationship between the economic policy uncertainty index and S&P using wavelet analysis for 11 countries in Asia, Europe and North America for the 1998-2014 period. According to the study's findings, government policy impacts numerous enterprises, and so EPUs cannot be totally diversified away.
- In their study, Arouri and Roubaud (2016) examined the relationship between economic policy uncertainty, stock returns and volatility for the stock markets of China, India and the USA for the period of January 2003-January 2014, unlike China, the increase in policy uncertainty in the USA and India significantly affected the stock returns. They concluded that it decreased significantly and increased the volatility in the market.
- Dakhlaoui and Aloui (2016), in their study examining the relationship between US economic policy uncertainty and BRIC stock markets, found that changes in US

economic policy uncertainty have a significant effect on the return behavior and volatility of BRIC stocks.

- Although Li et al. (2016) examined the causality relationship between economic policy uncertainty and stock returns for China and India, and concluded that there is no causality between economic policy uncertainty and stock returns for the two countries, Wu et al. (2016) analyzed the causality relationship between policy uncertainty and stock price with data covering the period of January 2003-December 2014 for 9 countries and determined that there is a causality from India, Italy and Spain stock indices to the economic policy uncertainty index.
- Moreover, Chen et al. (2017) investigated the predictive power of economic policy uncertainty for total stock market returns for January 1996 and December 2013 in Shanghai and Shenzhen stock markets and revealed that a high economic policy uncertainty in China causes lower total stock market returns.
- Christou et al. (2017) analyzed the effect of economic policy uncertainty on stock market returns for the monthly period of January 1998-December 2014 for Australia, Canada, China, Japan, Korea and the USA) and determined that stock market returns were adversely affected by policy uncertainties. In addition to this, Ongan and Göçer (2017) analyzed the causality relationship between the economic policy uncertainty index and the US stock indices (S&P 500, Dow Jones and Nasdaq 100) for the period 1985-2016 and found that the economic uncertainty index is the cause of all US stock indices. Following the idea, Tsai (2017) analyzed the risk of contagion of the economic policy uncertainty index to the stock markets of 22 developed and developing countries in China, Japan, Europe, and the USA for the period January 1995 to September 2015. As a result of the study, the economic uncertainty index is very effective in China and the risk of contagion spreads to different regional markets outside of Europe, the effect

of the economic policy uncertainty index for the USA is lower than that of China, the economic uncertainty index for Japan only affects the risk of contagion in emerging markets, and the European.

- Guo et al. (2018) In their study, using the monthly data of economic policy uncertainty indices for G7 countries and BRIC countries, they examined the dependency structure between economic policy uncertainty and stock market returns of G7 and BRIC countries, and found that economic policy uncertainty reduces stock market returns, except for France and England.
- Das et al. (2019) analyzed the effects of US economic policy uncertainty, geopolitical risk and financial stress on the stock markets of 24 developing countries for the period from January 1997 to May 2018. The findings obtained from the study have determined that the US-based economic policy uncertainty is deeper and more effective than geopolitical and financial stress, and in terms of causality, a stronger and more significant causality in variance than causality on average. At the same time, Jin et al. (2019) With the help of the index they developed to measure the uncertainty of Chinese economic policy, they examined the effect of economic policy uncertainty on the stock price collapse risk on the shares of China and A group companies with the data covering the 2009-2017 period found to be affected.

Uncertainty can negatively affect economic performance by causing firms to act on a “wait and see” strategy before making their investments, or by raising the borrowing costs of businesses and consumers or encouraging households to cut back on discretionary spending. It can also limit productivity growth by slowing capital accumulation and the reallocation of jobs and workers. Policy uncertainty has reached its highest level since the financial crisis in both the US and Europe. The upper debt limit crisis in the USA in the summer of 2011 is also a good example in terms of showing that the policy process itself creates uncertainty (Baker et al.,

2012). The most striking thing about the volatility in global financial markets with the 2008 financial crisis was that politicians took part in most of the news about the economy. The actions and statements of policy makers regarding the budget, bailout packages and reform arrangements cause very serious fluctuations in the financial markets. However, this situation is not seen as a normal situation. Since before the 2008 financial crisis, the fluctuations in the markets were generally shaped by the economic news. Simply put, the positive course of gross domestic product and employment figures brought about an increase in financial markets, and in the case of weak cooperation gains, it caused negativities and collapses in financial markets. However, today it seems that this is not the case; although all eyes are on politicians, unfortunately, politicians cannot stand in the same place as to why uncertainties arise (Baker et al., 2012). All above mentioned literature about the impact of EPU on stock market, firms and industries reveal a logical statement that all these events create huge risks for companies. Those risks make firms to delay their decisions, create agency issues in the company environment which directly affect the information environment of firms.

The view that uncertainty can negatively affect economic activity goes back to Keynes (1937). Keynes argued that due to the uncertainty surrounding the future, investments are subject to turbulence and this plays an important role in the performance of the economy. In the economic literature, it has been revealed that uncertainty can affect economies through investments, savings, consumption, labor market and risk premium. In addition, some studies have found that uncertainty can affect macroeconomic performance through the international spillover channel.

The effects of uncertainty on investments are analyzed based on 3 basic characteristics of investments. These are: i) investments cannot be reversed (Bernake, 1983; Dixit and Pindyck, 1994), ii) there is uncertainty about the future return on investments, and iii) investments can be delayed in order to obtain more information. A significant part of the economic literature

emphasizes that high uncertainty affects investment decisions through the “wait and see” mechanism (Bernake, 1983; Dixit and Pindyck, 1994). Dixit and Pindyck (1994), who draw a parallel between investment opportunity and stock option, argued that in cases where the investment cannot be reversed, uncertainty will increase the value of accumulating cash and waiting for new developments that will reduce uncertainty. During these “wait and see” period, some agency issues are likely to happen in the organizations.

Households' approach to uncertainty is similar to that of companies. Households increase their precautionary savings (Romer, 1990; Carroll, 1996) while waiting for new information for greater certainty, thus reducing their consumption expenditures (Knotek II and Khan, 2011) or increasing their income. As uncertainty dissipates over time and households learn more about their future well-being, a temporary increase in spending can be seen. Applying Bernanke's (1983) analysis to investigate how the uncertainty about the income of consumers in the USA affects their consumption expenditures, Romer (1990) showed that consumers expect to learn more about economic activity and delay their spending on durable goods.

The labor market can also be adversely affected by uncertainty. Companies faced with uncertainty may delay their hiring and firing plans due to the cost. In addition, uncertainty can also weaken productivity growth by slowing down the displacement of the workforce, thereby pulling down growth. In this framework, Bloom (2009) created a theoretical model at the company level and associated uncertainty shocks with growth and employment. Bloom (2009), who also established a series of vector autoregressive models to predict the effects of uncertainty on the US economy in the period of June 1962-June 2008, found a strong countercyclical relationship between economic activity and uncertainty. The impulse-response functions showed that uncertainty shocks first caused a decrease in employment and growth, then a recovery was recorded, and the baseline level was exceeded.

Recently, additional channels have been suggested in the economic literature through which uncertainty can affect macroeconomic performance. Among these, financial friction theories argue that uncertainty may increase the risk premium in financial markets, in which case the cost of capital may increase, and growth may be adversely affected (Arellano et al., 2012; Gilchrist et al., 2013; Popp and Zhang, 2015; Bonciani and Roye, 2015). Arellano et al. (2012) established a general equilibrium model and showed that the increase in uncertainty at the company level, together with the interaction with financial frictions, led to a decline in economic activity. They found that the model explained 67% and 73%, respectively, of the decline in growth and employment during the great recession of 2007/2009. Moreover, Popp and Zhang (2015) found that uncertainty shocks have a negative impact on the economy and financial markets, and the said effect is greater in recession periods. Popp and Zhang (2015), who also investigated the role of the financial channel, showed that the financial channel is important in the spread of uncertainty shocks and that this channel plays a greater role especially in recession periods.

There are also studies examining the international spillover effects of uncertainty shocks. These studies investigated the extent of diffusion, exporters/importers and dynamics. How does the diffusion between advanced economies (Colombo, 2013; Klossner & Sekkel, 2014; Mumtaz & Theodoridis, 2012) and from advanced economies (or global shocks) to emerging market economies (Gauvin et al., 2014; Carriere-Swallow & Cespedes, 2013) that has been examined. For example, Colombo (2013) examined the effect of economic policy uncertainties in the USA on macroeconomic variables in Europe through the structural vector autoregressive model. Colombo (2013) concluded that US policy uncertainty led to a decline in industrial production and prices in Europe. Carriere Swallow and Cespedes (2013) examined how the uncertainty shocks in the USA affected the investment and consumption expenditures of 40 countries. The findings of Carriere-Swallow and Cespedes (2013) showed that the effect is

heterogeneous, and investment and consumption expenditures in emerging market economies decreased more than developed countries in the face of uncertainty shocks. He explained this by the fact that the depth of financial markets is less in emerging market economies and stated that the credit channel was effective in the said decline.

Faccio et al. (2001) found that enterprises vulnerable to expropriation (closely associated with a business group and low ownership-to-control ratio) pay greater dividends. Since agency costs are higher in times of crisis (e.g., Bae et al., 2012; Lins et al., 2013; Meitton, 2002), the monitoring advantages of dividends should be higher as well. Because "a bird in hand is worth two in the bush", managers may choose to maintain or boost dividends to reliably transmit favorable earnings information. In addition, firms' sustainability varies depending on the degree of economic policy uncertainty. In terms of firms, increased economic policy uncertainty means higher risk and higher principal–agent costs, which makes it difficult for enterprises to exist and grow sustainably. Economic or political shocks can cause major real-world reactions such as investment curtailment, investment deferral, increased cost of external financing, or increased risk of financial distress, making sustainable growth for enterprises more challenging (Fang-Nan L., Xiao-Li J., 2019). More precisely, when companies face agency problems due to the impact of EPU, the information environment of firms will change significantly in a way that managers will choose to disclose any information that is in favor of them.

3.4. EPU and Stock Price Synchronicity

Although there's almost no single study studying relationship between economic policy uncertainty (EPU) and stock price synchronicity (SYNCH) except the study by Shen et al (2021), some scholars show that synchronicity depends upon how much information is integrated into the stock price, such as investment or dividend decisions (Gul et al., 2010). Economic policy uncertainty has a significant impact not only on the macro economy, but also

on micro elements of the company and governments, academics, and businesses are increasingly concerned about the economic effects of EPU.

In terms of the elements that influence stock price synchrony, Kim et al., (2015) mostly focused on managerial ownership, while Liu and Hou (2019) on trade credit and Neufar and Ajili (2019) on financial information quality. Jiang et al. on the other hand investigated influencing elements of synchronicity (Jiang et al., 2019). Given that EPU has a major impact on financial markets and company behavior, the issue of whether and how EPU could affect the SYNCH is an essential but unanswered one.

Shen et al. (2020) investigated link between EPU and SYNCH by taking evidence from China. According to study results, they discovered that EPU had a considerable detrimental impact on synchronicity. The adverse effect of EPU on SYNCH is reinforced by investment firms, elevated inspectors, and analyst monitoring and the preceding findings are also supported by robustness testing.

EPU can improve stock price synchronization by improving market information efficiency and it's worth noting that EPU has a detrimental effect on company behaviors including increased volatility and cost of capital. As a result, the government and businesses should assess the benefits and drawbacks of EPU before making scientific and rational judgments. The link between EPU and SYNCH is influenced by managerial ownership and institutional investors. As a result, organizations should analyze the impact of management ownership and institutional investors on stock price synchronicity.

First, greater investor attention to firm-specific information implies higher pricing efficiency on days of economic uncertainty. In other words, when economic uncertainty is high, stock prices should assimilate firm-specific information faster. Days of greater economic uncertainty should also be associated with greater demand for firm-specific data. Price informativeness declines with increasing economic uncertainty, increasing the incentive for uneducated

investors to learn. Concern over firm-specific information grows with economic instability (Andrei D., Friedman H., 2019). Above mentioned thoughts imply that the correlation between economic policy uncertainty (EPU) and stock price synchronicity (SYNCH) exists. In other words, increased economic uncertainty is related to the increased risks for the companies which gives a rise to agency problems and information asymmetry. As a result, firms are more prone to incorporate less information into the stock prices which reduces the stock price synchronicity. Considering the existing literature on stock price synchronicity (SYNCH) and economic policy uncertainty (EPU), the proposed hypothesis is as below:

H1: Economic Policy Uncertainty significantly negatively affects the stock price synchronicity.

4. Methodology

This paper will contribute to the future research of this topic by showing the impact of Economic Policy Uncertainty (EPU) on Stock Price Synchronicity (SYNCH) based on different factors from the reviewed literature and yield a more improved approach. This study will try to reveal the most relevant outcomes regarding the impacts of EPU on SYNCH from 20 countries where the EPU index data is available.

4.1. Research Strategy and Data Collection

This study is a both firm-level and country-level analysis since the data are collected for firms in different countries around the world. The correlational research design is implemented in order to reveal the correlation between Economic Policy Uncertainty and Stock Price Synchronicity. To examine the above-mentioned correlation, some secondary data from multiple sources and regression model analysis are used. A linear regression model is used to test this study and it uses some insights from Shen H., Xiong H. (2020) and Morck et al. (2000)

models. More precisely, the company and country data for the 20 countries is accessed through the ADA University Library, Thomson Reuters, Eikon database. Since the scope of this research is targeting different countries, samples of 71082 observations are tested in this study. However, some governmental and financial firms are eliminated because of the likelihood of being influenced by government policies and regulations. In addition, some observations that are missing the data are eliminated. The data includes the yearly EPU index years between 2010-2019 and it is the main independent variable in the chosen regression model. Period between 2019-2021 is not considered in this study because that period relates to the COVID-19 issues all over the world and some data were missing during that period. On the other hand, the stock price synchronicity (SYNCH) of the firms is the dependent variable which can be defined as a measure of information reflected in returns internationally (Morck, Yeung, YU, 2000). Additionally, firm-level and country-level variables are also used in this model to reveal a more thorough approach from both sides. Precisely, some firm-level variables such as Total Assets, Total Debt/Total Asset Ratio, EPS, Growth in Assets, Dividend Payout Ratio, Analyst Coverage, Market Value to Book Value Ratio, Loss and country-level variables such as legal authority types, GDP, democracy level, human capital, rule of law and press freedom are used in the model to reveal a more comprehensive approach. After separating the variables into dependent, independent and moderating types, the model will be run to test the hypotheses. Regression results will reveal if the variables have positive, negative or no correlation with each other. Since quantitative data allows for using a big pool of data for different companies, panel data will be used for studying the impact on the firms over the period between 2010-2019 because the research is cross-sectional. Moreover, several regression models will be used in this study to reveal the individual and group impacts of the independent variables. More specifically, regression models will be based on firm-level, country-level characteristics, and

some alternate measures differently and altogether across different industries during 2010-2019.

4.1.1. Measures

Dependent variable in the regression model is stock price synchronicity which is measured as the R^2 of the asset pricing regressions. Main independent variable in the model is the EPU index for the applicable countries over the years between 2010-2019. In some models, the World Uncertainty Index is included as a proxy to EPU as an independent variable to unveil the impact of alternate measures on the dependent variable. Moreover, some control variables - (1) Total Assets, (2) Total Debt to Total Asset Ratio, (3) EPS, (4) Growth in Assets, (5) Dividend Payout Ratio, (6) Analyst Coverage, (7) Market Value to Book Value Ratio 8) Loss 9) Legal Authority 10) GDP 11) Democracy 12) GDP Growth 13) Human Capital 14) Rule of Law 15) Press Freedom are used in the model to explain more detailed approach to the study. Details of the measures are discussed below:

Stock Price Synchronicity (SYNCH)

In general, there are 3 ways of measuring stock price synchronicity. First method is about using the standard deviation of residuals coming from the Fama-French three-factor asset pricing model (Fama E. F., 1993). Second method is also coming from the Fama-French three-factor regression model, but in order to get conditional idiosyncratic volatility, the EGARCH model is applied in this measure. The measure of stock price synchronicity in this study is derived from Morck et al. (2000). The regression is generated only for firms with at least 40 weekly returns observations per year. The estimated model will be as below:

$$R_{i,t} = \alpha + \beta(R_{m,t}) + \varepsilon_{i,t} \quad (1)$$

Ri,t is the return of stock 'i' during week 't' and Rm,t is the return of market index 'm' for the same week. ε represents the unobserved random errors in the model where all returns are measured on weekly basis.

The coefficient of the determination (R^2) is the measure of stock price synchronicity which is obtained from the estimation of model (1). Logarithmic transformation is applied in this situation since the R^2 is between 0 and 1. Higher the synchronicity measure indicates that the greater amount of the returns is explained by the market. After the applied transformations, the stock price synchronicity will be defined as below:

$$\mathrm{SYNCH_{i,T}} = \log\left(\frac{\mathrm{R^2}}{1-\mathrm{R^2}}\right) \quad (2)$$

Where, $SYNCH_{it}$ is the estimation of synchronicity of stock *i* for year *t*.

Economic Policy Uncertainty (EPU)

The main independent variable of the model is the Economic Policy Uncertainty index which is taken for 20 countries: UK, Australia, Belgium, Brazil, Canada, Chile, Croatia, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Singapore, South Korea, Spain and Sweden. The EPU index data in the model is used from the Baker et al. (2016) model to calculate the average yearly index. EPU index has been measured by three components. First component is expressed as a newspaper coverage of economic uncertainty related to policy and it is an index of search outcomes from 10 newspapers. Second component of the index is displaying the tax code provisions that are listed in reports. Last component of the index applies to the dispersion among the predictions of the forecasters. The

index shows the country-level data for the years between 2010-2019 for better analysis and high/low index numbers will show the level of high/low uncertainty in a particular country.

In other words, EPU in its high levels affects the financing ability of the firms in a way that companies face problems with external financing which also increases costs. Building on this idea, firms tend to disclose less information to the outside which, in turn, decreases synchronicity (Neifar and Ajili, 2019). Since the main goal of the study is to show the correlation between EPU and SYNCH through some influencing factors, this independent variable is crucial for understanding its various impacts.

Total Assets

Another control variable used in the model is the total assets of the companies. Total assets represent property owned by the company for a specified period, including tangible assets, intangible assets, financial investments, cash and liabilities. Total Assets must be equal to Total Liabilities + Equities. For commercial companies, Total Assets can be divided into Current Assets and Fixed Assets. It is important to take control of this measure since an asset is a resource with economic value that a company has with the expectation that it will provide future benefits. Therefore, taking control of this measure is important because it is related with the ongoing operations of the firms and their profitability. Profitable firms are more prone to disclose relevant and transparent information which will affect the synchronicity of stock prices.

Leverage

This is another control variable that should be taken into account which determines the financial risk of a company. Financial leverage ratio is also one of the liquidity situation analysis ratios, as it is frequently used by analysts who make financial analysis in company evaluations. The financial leverage ratio is also called the debt ratio. Mitton (2002) mentions the negative correlation between leverage and stock returns in emerging markets. In other

words, it gives information about debt ratios of businesses, and it will be measured by the ratio of total debts to total assets in this model.

Growth in Assets

Another important control variable to consider in the model is the growth in assets. This variable explains at what rate the company is growing its assets and is calculated as a percentage change over a given period of time. This measure as the total assets of the company addresses the growth in company's assets and is related with the profitability and decision-making of firms which will eventually reflect itself in the information disclosure by firms.

Analyst Coverage

Another important control variable that is used in the regression model of the study is the analyst coverage. Analyst coverage explains the number of analysts who monitor a certain stock or a security. This variable is a crucial measure to consider since it adds value to the companies by conveying information about the performance of firms. Moreover, visibility of the companies is increased to investors even if no new information is available (Mola, Rau, & Khorana, 2013). Companies are pursuing the analyst coverage continuously since it is directly related to the information environment of the firms which eventually reflects itself in the stock prices. In other words, this measure is used in the model for its connection with the stock returns of the companies and the SYNCH.

Firm Size

This independent variable is considered to have a considerable effect on the stock price synchronicity. In other words, smaller firms tend to face more problems with financing and suffer from uncertainties due to information asymmetry (Mitton, 2002). Firm size is measured by using log of firms' total assets.

Dividend

Dividend variable used in the model is the dividend yield and it is calculated by the ratio of dividends paid per share to price per share. It is essential to control for this measure since literature suggests that dividend payment policy of the companies can have an impact on their stock returns. To elaborate, companies are not willing to decrease dividends significantly from one period to another since it will result in a decrease in stock price, while firms not paying dividends can be also classified as companies with profitable investment options (Adam H., 2022). Therefore, firms paying dividends tend to face less agency problems which is directly linked with the information asymmetry. If information disclosure by firms are more transparent, stock price synchronicity will be higher.

Growth

This independent control variable is also considered crucial since growth prospects of a company is a significant part of corporate finance decisions made. It is measured by the ratio of market-to-book value ratio of the company. A high market-to-book value ratio is linked to improved investor confidence which is assumed to help dividend policy of the firms. Since it affects the dividend policy, high growth means less agency problems and increased informativeness of stock prices.

Earnings Per Share

The model also controls for profitability of the firms considering the earnings per share (EPS). It is measured by a ratio of net profit to the outstanding number of shares of the company. When comparing companies, the company with higher earnings per share is considered stronger. Compared to the company's current performance in the past, an increase in earnings per share indicates increased profitability. It is important to take EPS as a control variable since it directly shows the earnings for each share of the company and the stock price synchronization will be indirectly affected by its existence and dynamics. (Eriostis and Vasiliou, 2003) found

that firms with high EPS figures tend to pay more dividends which reduces agency problems and information asymmetry.

Loss

Loss in the model is a dummy variable that takes the value of 1 for the loss-making firms, and 0 for profit-making firms. Existing literature also supports that the loss-making firms are more prone to risks, and they are not paying dividends which is in a negative correlation with the price informativeness of the stocks.

Legal Authority

Legal authority is a dummy variable in the model that takes the value of 1 for common law countries and 0 otherwise. This variable is chosen because of its possible impact on synchronicity. In other words, legal authority of a country means how legal measures are taken into account in the firms' operations. Depending on the legal authority, firms may choose different information disclosure strategy which will eventually reflect itself in the informativeness of the earnings in the stock market.

GDP

Gross domestic product is the indicator that covers a certain period and represents the monetary equivalent of goods and services produced within the national borders of the country. The important point here is that the goods and services produced by foreigners are included in the GDP. GDP of a country is highly linked with the firms' profitability and dividend policy. As mentioned before, dividend policy is highly correlated with the agency issues and information environment of firms. Calculation is as below:

GDP = Consumption (C) + Investment (I) + Government Spending (G) + Net Exports (NX)

GDP is this model is the log of GDP of the country.

Democracy

It measures the level of democracy in the country. The variable ranges from 0 to 10 where 0 is least democratic and 10 most democratic. Democracy in a country is also linked with the firms' daily operations. Meaning, democracy indirectly affects the economic growth by having an impact on the human capital of a country. Democracy is also linked with higher economic freedom where companies will choose to operate transparently. When firms operate transparently and disclose right information to the market, it will affect the stock price synchronicity positively by increasing the informativeness of the earnings.

GDP Growth

It measures the one-year growth in the GDP of the country and calculated by dividing the difference between the years by the previous year. This variable is as important as the GDP itself since it shows the growth which is also an indicator of the firms' profitability and ease of doing business in the country. When it is high, firms tend to pay more dividends and face less agency problems which will improve the informativeness of the stock prices. Eventually, synchronicity will be higher.

Human Capital

It measures the human capital of the country. Human capital is highly linked with the economic growth of the country. Since it is about the knowledge, skill and experience of the workers, it is highly correlated with the companies' operations. Highly skilled people will drive the firms to increase their profitability and operate more transparent which will reduce the agency problems and information asymmetry.

Rule of Law

It measures the rule of law and includes several indicators which measure the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability

of contracts. Together, these indicators measure the success of a society in developing an environment in which fair and predictable rules form the basis for economic and social interactions and the extent to which property rights are protected. When economic and social interactions are in good shape and property rights are well protected in a country, firms will tend to operate transparently and disclose right information to the markets which will increase the informativeness of the stock prices.

Press Freedom

The Press Freedom index measures the amount of freedom journalists, and the media have in each country and the efforts made by governments to see that press freedom is respected. It ranges between 0 (total press freedom) and 100 (no press freedom). Countries with high press freedom are the ones where firms operate in a free trade environment and competition is high. In other words, those firms are more likely to face less agency problems and pay higher dividends which will eventually affect the firms' information disclosure positively. When information disclosure are transparent and correct, stock price synchronicity will be higher as well since the stock prices will reflect all the information.

4.2. Data Findings – Descriptive Statistics

Panel A of Table 1 describes the average values of synchronicity, R-square and economic policy uncertainty across 20 countries where the EPU index is applicable to. It is obvious from the table that the highest R-square is in Chile while Canada has the lowest R-square. In other words, since the synchronicity is the logarithmic value of R-square, Canada also has the lowest synchronicity value which means the stock prices are less informative in Canadian firms. Moreover, the highest EPU index is in France, while the lowest number for EPU index is in Mexico. While Japan has the highest number of observations (27415), Ireland has the lowest number of observations in this study.

[Insert Table 1 – Panel A here]

Panel B of Table 1 is also the average values available for the sample period. To be more precise, EPU index is the highest in year 2016 and 2019 which can also be explained by a COVID-19 pandemic through the end of the year. Highest R-square are observed in year 2011 which shows the EPU index of 162.28 in the same year, while the lowest R-square value of 0.1147 in 2017 also resulted in the lowest synchronicity of the stock prices in that year. Highest number of observations are obtained in 2018 where synchronicity, R-square and EPU values are -1.6534, 0.2140, and 141.6885 respectively.

[Insert Table 1 – Panel B here]

Table 2 is the descriptive statistics of firm-specific and country-specific control variables that are used in the model. It is seen from the table that, the average EPU index is 148.0052 and synchronicity is -1.9310. In a sample of 69239 observations, approximately 20% of the firms are making losses, which means the in average, 80% of the firms are making profit in this case. In addition, median firms are not making any losses in this observation. Moreover, average number of analyst tracking the stock prices is 3.7211 from the sample of 71082 observations. Building on this measure, table shows that the median firms are not followed by any analyst. Growth in assets is 10.4% on average and capital expenditures account for the 4% percent of the total assets. Additionally, 19.33% of the firms are holding more cash on average which is also related with the rising economic policy uncertainty that creates constraints for firms. Table also indicates the leverage values which is the debt to assets ratio in companies. On average, leverage ratio is 1 to 20.71 which can also be explained by the external financing constraint of firms during high economic policy uncertainty. Furthermore, 20% of the firms from the sample

of 71082 observations are holding a common law as a legal authority. Median firms in this manner are not authorizing a common law, but other types of legal authority since this measure is a dummy variable in the model.

[Insert Table 2 here]

Table 3 is focusing on the indication of differences between the average values control variables at different percentiles and shows if there is a significant difference that should be considered. Firstly, firms with high EPU index are bigger than the firms with lower EPU index and the correlation indicates a significant difference which necessitates to consider the "SIZE" as a control variable in the model. Moving on, there is also crucial difference between the firms with their market to book value ratio. More precisely, firms with lower EPU index has higher market to book value ratio which means the market value of firms facing with lower economic policy uncertainty have greater market value compared to the their book value which may also incorporate differences in the information asymmetries of those firms. Moreover, "LOSS" is another control variable that should be considered because of an important difference between the firms making losses. In other words, on average 23% of the firms with low EPU index is making losses, while 12% of the firms with high EPU index is making losses which causes a difference between those firms. This idea is also related with the "SIZE" variable in a way that bigger firms are making fewer losses than the relatively small firms. Additionally, table indicates that the firms with lower EPU are on average followed by more analysts than the firms with higher EPU. This can be explained by a reason that, higher EPU affects the information disclosure of firms negatively, which means the stock price of firms are not well incorporated with the relative information. "CASH" is another important control variable that should be in consideration since the table displays that the firms with higher EPU are holding more cash than the firms with lower value of EPU. Some other country-specific control

variables such as “GDP”, “Rule of Law”, “Press Freedom” should also be considered because of the significant difference they create for the firms with different levels of EPU.

[Insert Table 3 here]

Table 4 is the indications of the correlations between the variables. The results of this correlation matrix are positive in a way that those control variables can be used in any regression equations because the correlation figures are not very high. Moreover, variables such as “EPU”, “MBR”, “LOSS”, “ASSETGROWTH”, “GDPGROWTH” indicates a negative correlation with the dependent variable, “SYNC”. On the other hand, “SIZE”, “DIVIDEND”, “DEMOCRACY” and “PRESS” have a relatively positive correlation with the dependent variable.

[Insert Table 4 here]

5. Analysis and Discussions

Table 5 is the baseline analysis showing the correlation between economic policy uncertainty and stock price synchronicity. A pooled OLS regression model used in this table since the collected data is not well-balanced. Meaning, since the data is for the period from 2010 to 2019, some firms that are available in a year may not be available to get information for the next year. Overall, four OLS regression models are used in this table in order to reveal more comprehensive and individual impacts between variables. Regression model (1) is considering the synchronicity (SYNCH) as a dependent variable and economic policy uncertainty (EPU) as an independent variable and the model is as below:

$$\text{SYNCH} = \alpha + \beta_1(\text{EPU}) \quad (1)$$

Results of the first model report a significant negative correlation between the EPU and SYNCH. In other words, a 1 unit increase in EPU causes SYNCH to decrease by 0.0032 units which is considered a significant correlation. To interpret, we can argue that economic policy uncertainty is significantly negatively affecting the stock price synchronicity which is consistent with the mentioned hypothesis in the literature review part. This negative correlation between EPU and SYNCH is also supported by the existing literature. Sharad A., Rachana K. (2020) examined the impact of economic policy uncertainty on the reactions of market participants and managers by collecting a sample of 2973 firms between years 1990-2016. Study results indicate that high economic policy uncertainty lowers the managers' confidence in earnings, and they tend to disclose less or false information that will be incorporated into stock prices. Since the synchronicity is defined as the price informativeness of the stocks, when the disclosed information is less than before, synchronicity will decrease. In addition, high economic policy uncertainty means the increased risks for the company since those firms will find it hard to predict future happenings. Therefore, the ability of the firms to interpret and disclose information will go down as a result of an increase in EPU. Since firms with less stock price synchronicity have less informative stock prices than other firms, EPU will negatively affect the stock price synchronicity of firms because of its negative impact informativeness of stock prices (Dasgupta et al. 2010). Negative correlation between EPU and SYNCH can be supported with more literature relatively. In other words, increasing economic policy uncertainty can be linked with the problems with the firm governance which is an important factor affecting the synchronicity. Events such as inclusion in S&P 500 index increases the governance environment of firms cause synchronicity to go up as well (Barberis et al., 2005). Building on this idea, since economic policy uncertainty adversely impacts the stock markets and indexes, it is hard for firms to improve their governance environment and include

themselves in highly rated indexes when they are facing high economic policy uncertainty. To support the findings in model (1), we can argue that the firms often operate with a waiting strategy, delay their decision-making procedures, prefer not to pay dividends because of the unpredictability of the future periods during the times of high economic policy uncertainty. Firms not paying dividends are more prone to face agency problems which will eventually result in improper information disclosure by managers. Synchronicity, under this circumstance, decreases as a result of poor informativeness of the earnings. To elaborate more in this manner, it can be argued that when firms face higher economic policy uncertainty, they tend to hold more cash as a part of their capital structure. The reason for holding more cash can be explained by the unpredictable future events and increased risks for the companies. Increased risks for a company mean that the agency problems are more likely to happen in that environment. As explained before, increased agency problems

The study is extended by adding another model (2) which is considering some firm-specific control variables such as SIZE, DIVIDEND, MBR, LOSS, ANALYST, ASSETGROWTH, CAPEX, CASH and LEVERAGE. Proposed regression model is as below:

$$\text{SYNCH} = \alpha + \beta_1(\text{EPU}) + \beta_2(\text{SIZE}) + \beta_3(\text{DIVIDEND}) + \beta_4(\text{MBR}) + \beta_5(\text{LEVERAGE}) + \beta_6(\text{LOSS}) + \beta_7(\text{ANALYST}) + \beta_8(\text{ASSETGROWTH}) + \beta_8(\text{CAPEX}) + \beta_9(\text{CASH}) + \varepsilon \qquad (2)$$

Results of the second regression model also report the significant negative correlation between EPU and SYNCH. Precisely, 1 unit increase in EPU causes a 0.0031 decrease in SYNCH. Interestingly, firm-specific control variables that are used in this regression model show positive and negative correlation which can be linked with one another. For instance, SIZE variable indicates a positive correlation with SYNCH in a way that 1 unit increase in SIZE results in the increase by 0.2803 in SYNCH. To analyze this result, when the firms get bigger, the ability of those firms to collect more information and disclose also increases. When firms

are able to disclose more information to the market, price informativeness of the stocks will also go up and this, in turn, will result in the increase of synchronicity. In addition, DIVIDEND measure in the second model indicates a positive significant correlation with SYNCH variable which means that a 1 unit increase in dividend yield will cause 0.0118 units of increase in SYNCH. This correlation can also be analyzed from different perspectives. For example, the positive correlation figure means that firms paying higher dividends will face relatively higher synchronicity. This can be interpreted in such a way that when firms pay higher dividends, they observe less agency problems. Since agency problems negatively affects the informativeness and transparency of stock prices, prices will reflect more and correct information when there are less agency problems in the company (Fang-Nan L., Xiao-Li J., 2019). LOSS in the model is a dummy variable that appoints 1 for the loss-making firms and 0 otherwise. This variable shows a negative correlation with SYNCH by implying that when more firms are making losses, the ability of those firms to mitigate risks and predict the future events goes down. When these events happen, the informativeness of the stock price will also start to demolish. In other words, high EPU means riskier situation for the firms which increases their chances to fail that will result in low price synchronicity as explained. On the other hand, ANALYST in the model is also indicating a positive correlation with SYNCH. We can analyze this correlation such that the analyst following is considered as a proxy for governance environment of firms. Moving on, when firms are followed by more analysts, it means the governance of those firms are more developed which makes it probable for firms to incorporate more information in stock prices. Besides, ASSETGROWTH and CAPEX indicates a negative significant correlation with the SYNCH, while LEVERAGE shows a positive significant correlation.

Model (3) of the regression includes country-specific factors and measures their impact on stock price synchronicity. Regression model built is as below:

$$\begin{aligned}\text{SYNCH} = \alpha + \beta_1(\text{EPU}) + \beta_2(\text{LEGAL}) + \beta_3(\text{GDP}) + \beta_4(\text{DEMOCRACY}) \\ + \beta_5(\text{GDPGROWTH}) + \beta_6(\text{HCAPITAL}) + \beta_7(\text{RULELAW}) + \beta_8(\text{PRESS}) + \varepsilon\end{aligned} \quad (3)$$

Results of the regression model (3) is also in line with our main hypothesis that economic policy uncertainty negatively affects the stock price synchronicity. Precisely, a 1 unit increase in EPU results in 0.0010 decrease in SYNCH. This model also reveals some interesting results by incorporating the country-specific variables. To explain, GDP variable shows a considerable positive correlation with SYNCH and a unit increase in GDP results in 0.1725 units increase in synchronicity. In other words, countries with higher GDP figures tend to have more synchronicity in stock prices. Moreover, higher GDP figures can also be related with the less firms making losses in the country which gives them ability to disclose more information transparently that causes informativeness of stock prices to rise. EPU, on the other hand, is believed to have a considerable effect on the economies of the since the uncertainty is directly related with the economy. In other words, high EPU implies the low efficiency of the markets, declined investment by external investors, reduced exports, less government spending because of a "wait and see" strategy etc. (Bernake, 1983; Dixit and Pindyck, 1994). These events in total impact the GDP of the country to deteriorate. Interestingly, LEGAL variable has a negative significant relationship with SYNCH. Meaning, when number of countries authorizing common law increases by 1 unit, synchronicity decreases by 0.4689 units. This correlation can be explained by saying that countries that apply common law practices tend to face higher uncertainty which makes it challenging for firms to disclose more information. As a result, stock price synchronicity decreases because of a decline in informativeness of stock prices. Another interesting point to discuss is about the rule of law in the countries. High rule of law means more predictable economic and social interactions, protection of property rights, predictability of judicial system etc. Regression model (3) reveals that an increase of 1 unit in rule of law measure results in 0.4207 units of increase in stock price synchronicity. To analyze,

countries with high EPU tends to observe more risks regarding economic and social interactions and rule of law is less in high EPU countries. Gladyson B., Patricia B. (2015) studied the impact of EPU on the information environment of firms with the sample of Brazilian firms. The study revealed that the higher uncertainty increases the financial constraints of firms, causing the companies to delay their decisions because of the uncertainty regarding the future economic events. Increased information asymmetry makes firms to face more agency problems and most of the information is not transparent during that period which results in a decreased stock price synchronicity.

Regression model (4) reveals more comprehensive approach by combining both firm-specific and country-specific variables.

$$\begin{aligned} SYNCH = \alpha + \beta_1(EPU) + \beta_2(SIZE) + \beta_3(DIVIDEND) + \beta_4(MBR) + \\ \beta_5(LEVERAGE) + \beta_6(LOSS) + \beta_7(ANALYST) + \beta_8(ASSETGROWTH) + \\ \beta_9(CAPEX) + \beta_{10}(CASH) + \beta_{11}(LEGAL) + \beta_{12}(GDP) + \beta_{13}(DEMOCRACY) + \\ \beta_{14}(GDPGROWTH) + \beta_{15}(HCAPITAL) + \beta_{16}(RULELAW) + \beta_{17}(PRESS) + \varepsilon \quad (4) \end{aligned}$$

After controlling for all the variables that were defined before, the model again indicates a negative impact of EPU on SYNCH. By numbers, when EPU increases by 1 unit, SYNCH decreases by 0.0012 units relatively. The variables that were indicating positive and negative significant correlation with SYNCH are active in this model as well with small moderations. Specifically, when all the factors are included, CAPEX from firm-specific factors and HCAPITAL from country-specific factors became irrelevant to show the correlation.

[Insert Table 5 here]

5.1. Additional Findings

This study is extended by adding more analysis by using Robustness checks and this contributes to the validity of the research and hypothesis that was built. Table 6 is the findings

of the regression model that used the World Uncertainty Index (WUI) as a proxy measure of EPU. The reason behind this rationale is because the EPU is not measured from single source. In other words, EPU index constructed from 3 sources: newspaper coverage of policy-related uncertainty, lists of temporary tax code provisions and measure of difference between the predictions of the forecasters about Consumer Price Index, Federal Expenditures, State and Local Expenditures that are used to construct the index. However, it is always recommended to use some alternate measures to observe if there is a significant difference between the variables. Therefore, World Uncertainty Index, that is computed by the count of "uncertain" word in the country reports, is used in this model (6) to reveal more comprehensive approach to the topic. Since this index is constructed only from single source, it is more differentiable than EPU. Consistent with the expectations, results of the table (5) confirm the negative impact of economic policy uncertainty on stock price synchronicity. One of the interesting findings here is that the correlation coefficients on model (1) and model (4) is very high. Regression model (1) consists of one independent variable which is the WUI (proxy of EPU) and one dependent variable, synchronicity. Regression results indicate that a 1 unit increase in WUI will result in 0.9480 decrease in synchronicity which means a very significant negative relationship between these variables (t-value -31.05). In addition, regression model (2) is built by controlling for the firm-specific variables. This model is also consistent since it reveals a negative correlation between WUI and synchronicity. SIZE, DIVIDEND, ANALYST, CASH and LEVERAGE are observed to positively impact the synchronicity, while MBR, LOSS, ASSETGROWTH and CAPEX have a negative correlation with the stock price synchronicity. To analyze, companies facing high growth in their assets relative to the companies with more stable growth are more prone to risks. When firms are under risky circumstances, their ability to interpret more transparent information goes down. As a result, informativeness of stock prices again decreases which causes stock price synchronicity to decrease as well. Moreover,

regression model (3) is constructed by including only country-specific variables. Another interesting point to stress out is that when only country-specific variables are included to control for the differences, the correlation coefficient shows stronger connection. To be more precise, when WUI increases by 1 unit, synchronicity decreases by 0.4827 units which is considered a significant relationship. Last regression model is built by controlling for differences both in firm and country-specific variables. The result of this regression is also consistent with the expected outcomes and revealed a negative correlation between WUI and synchronicity. To elaborate, when both firm and country control variables are added in the model (4), the negative correlation becomes stronger than the ones with single source control variables. Correlation coefficient in this model implies that when WUI increases by 1 unit, synchronicity will go down by 0.8544 units.

[Insert Table 6 here]

Additional test results that have been revealed are presented in Table 7. This time we tried to find the correlation between economic policy uncertainty and future stock price synchronicity by using one period ahead measure. Future synchronicity is considered to check for the reverse causality problem which says that the correlation sometimes may not be as expected despite the expected results. In other words, there may be a scenario where synchronicity may impact the economic policy uncertainty. However, by taking relevant measures results indicate the expected results consistent with the previous findings. All 4 models are the same in structure as before only the dependent variable is the measure of future synchronicity. All the regression results shows that the EPU significantly negatively affects the synchronicity.

[Insert Table 7 here]

In order to enhance the understanding of the relationship between economic policy uncertainty and stock price synchronicity, some interaction terms are added to the model and reason for

this is to see how the impact of EPU on SYNCH will differ based on firms with different characteristics. Results of the Table 8 are in line with the proposed expectations that economic policy uncertainty negatively affects the stock price synchronicity of firms. The table reports the results of firm-specific factors' impact on the correlation between EPU and SYNCH. To analyze some of the results, SIZE variable, that is measured as the size of the companies in dollar terms (log of the total assets of a firm), is believed to have a positive impact on the correlation. Specifically, when we fix the firm-specific factors in the model, we are able to see the exact impact of EPU on SYNCH with the same types of companies. For instance, for the 2 firms with the same size, the one with the higher EPU tends to have higher synchronicity according to the regression results. In other words, if EPU*SIZE reveals a positive coefficient result, it means the impact of EPU on SYNCH will be less negative for bigger firms. Moreover, when there are 2 firms with the same dividend yield, the firm that face a higher EPU will have lower synchronicity. Since the DIVIDEND*EPU coefficient is negative, we can interpret that the impact of EPU on SYNCH will be more significantly negative for high dividend paying firms. Same applies for the market to book ratio variable where the coefficient for MBR*EPU is positive. This means that the effect of EPU on SYNCH will be relatively less negative for firms with higher market to book ratio. Analyzing the dummy variable (LOSS), it is obvious that the impact is significantly negative. Meaning, when there are 2 loss-making firms, the one having the higher economic policy uncertainty has the lower synchronicity. In addition, coefficient for ANALYST*EPU also shows a negative figure (-0.0002). We can assume that the EPU will have more negative impact on SYNCH if the firms are followed by more analysts. This assumption also aligns with the mentioned literature which mentions that analyst following increases informativeness of reported earnings in the MENA region (Farooq, 2013). Elaborating on this idea, we can assume that the stock price synchronicity is high when the informativeness of the earnings is increased. Besides, CAPEX*EPU shows a crucial positive

correlation with the synchronicity (0.0055). To analyze, EPU affects SYNCH negatively on its own, however, when interaction terms are added, firms having more capital expenditure as a part of their total assets lessen the negative impact of EPU on SYNCH. This idea can also be linked to the assumption that when the capital expenditure is high, that firm is also not planning to pay dividends but invest the amount instead which may cause agency problems. Moving on, agency problems in the company will negatively affect the stock price synchronicity by decreasing the informativeness of the earnings.

[Insert Table 8 here]

The table (9) reports the impact of country-specific factors on the correlation between EPU and SYNCH. For instance, LEGAL*EPU interaction term shows a negative coefficient (-0.0006, t value – 9.43). This means that the impact of EPU on SYNCH becomes stronger in countries which practices common law as a legal authority more. In addition, GDP*EPU interaction shows a significant negative correlation. In other words, higher GDP means that the negative impact of EPU on SYNCH strengthens more. This means that the countries with higher GDP figures tend be developed countries where uncertainty may be higher than other countries. Moreover, RULELAW*EPU indicates a negative coefficient of -0.0027 which means that the countries where property rights are well protected and investors have confidence in, the negative impact of EPU on SYNCH decreases.

[Insert Table 9 here]

5.2. Theoretical Implications

Many studies have been conducted on the economic policy uncertainty and its impact on the individuals, firms and countries. Particularly, economic policy uncertainty is believed to have an impact on almost every decision the firms take. On other hand, there are huge amount of

research that are formed to analyze the relationship of stock prices with macroeconomic/microeconomic variables. Since those variables are of a great importance when it comes to the economic environment of the countries, companies' reactions to the changes in economy are followed by the changes in their performance which eventually shows itself in the stock prices.

One of the problems with the existing literature is that there is there is only 1 research that has been conducted on measuring the impact of economic policy uncertainty on the stock price synchronicity. This study will contribute to the existing literature by adding new academic research regarding this topic which later can be referenced to improve the studies.

Another gap in the existing literature is about the boundaries of the conducted study. In other words, the research by Shen H., Xiong H. (2020) focused on only 1 country (China) and the sample period is from 2000-2017 which may create some biases since the country-specific factors may influence the results. In this manner, this study will enrich the existing literature by including 20 countries to the research and sample period from 2010-2019 to reveal a more comprehensive approach. In other words, this research paper has controlled for the country-specific and firm-specific variables. Later, Robustness tests and alternate measure (proxy for EPU) has also been included in this study for identifying the 2-sided correlation: Economic Policy Uncertainty (EPU) and Stock Price Synchronicity (SYNCH).

5.3. Practical Implications

Despite the fact that our research is likely to have more theoretical than practical implications, our findings may be useful to the market. First of all, investors who are trying to find valuable stocks and willing to invest to earn an income, can benefit from this study. In other words, they can analyze the situation in 20 countries where the EPU index is applicable to and understand the impact of EPU on the stock movements in those countries. To put it in another way, this

study reveals the correlation between the economic policy uncertainty and stock price synchronicity by including firm-specific and country-specific variables. This inclusion might help the investors and individuals interested in finance to better analyze the above-mentioned correlation and control for the differences across the variables to see the real impact. Since the impact of EPU on synchronicity is revealed by identifying how the uncertainty impacts the information environment of firms through agency problems, investment decisions and other important factors, individuals are able to see the bigger picture and logical flow between these factors.

5.4. Limitations

As for every case, this study also have its own limitations and they are pointed as below:

- Since the COVID-19 period was mainly surrounding years 2019-2021, this study did not include the data after 2019 to reveal more reliable findings.
- Only 1 study that has been conducted exactly about the relationship between economic policy uncertainty (EPU) and stock price synchronicity (SYNCH)
- Some literature suggesting the opposite arguments to the ones revealed in this study
- Another limitation of this study is the lack of time to conduct the research since this topic needs more time to analyze every point in detail
- One of the limitations of this study is that the EPU index is normally measured from 3 different sources: newspaper, tax provisions and expectations which creates a possibility of making wrong comparison. Therefore, in order to prove that a real correlation exists between EPU and SYNCH, different measures such as World Uncertainty Index was measured.
- Possibility of a reverse causality issue may be considered as another limitation of this study.

5.5. Ethical Considerations

Ethical considerations were taken into consideration while conducting this research.

6. Conclusion and Recommendations

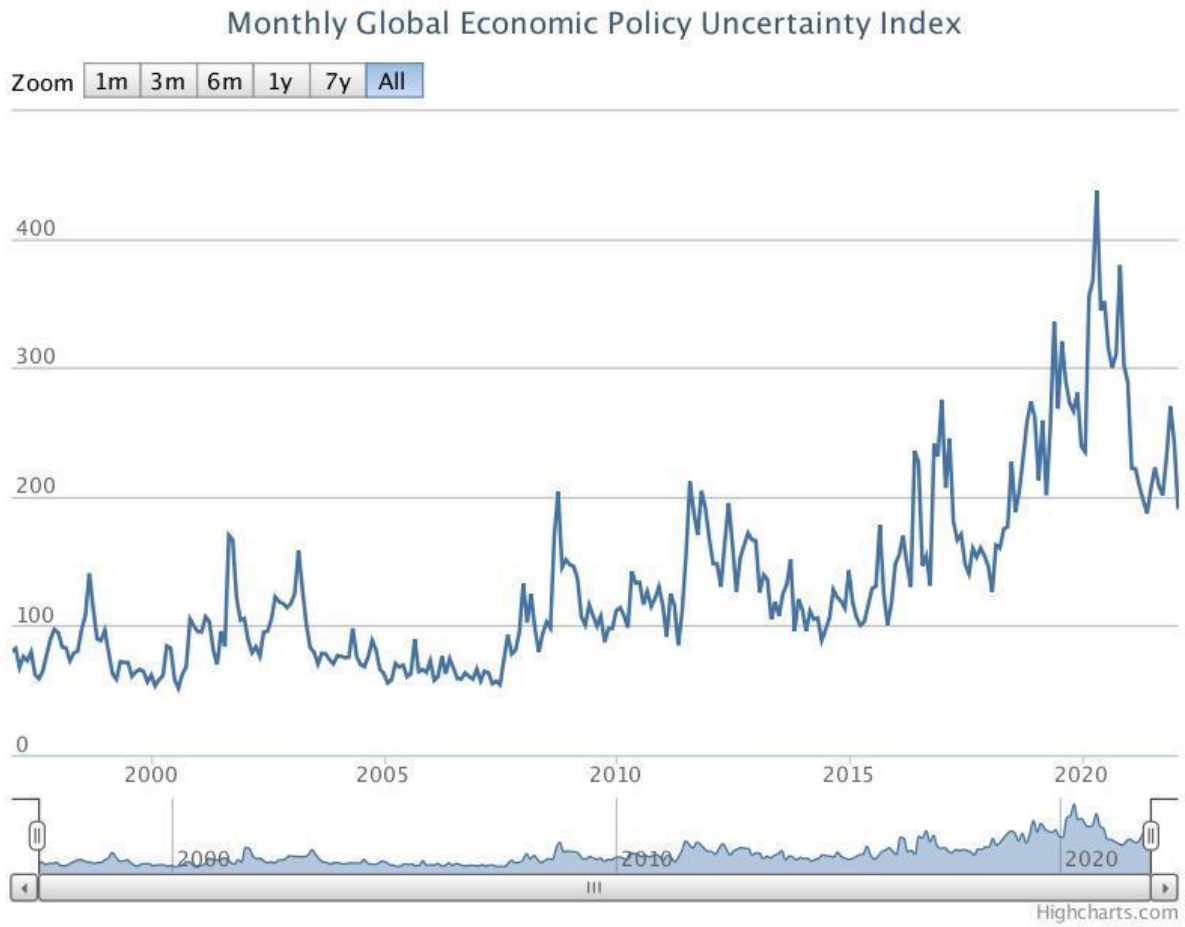
This paper documents the impact of economic policy uncertainty on stock price synchronicity during the period between 2010 and 2019. By incorporating synchronicity (SYNCH) as a dependent variable, uncertainty (EPU) as an independent variable and adding some firm-specific and country-specific variables to the model, pooled OLS regression models were run to reveal the correlation between the variables because it is possible that the data is not well-balanced. In order to reveal a more comprehensive results, 4 regression models were used in the study. Model 1 was about the correlation between EPU and SYNCH, firm-specific variables are added to the model 2, country-specific variables were added in model 3 and the last model included all the variables. The results of all the variables were in line with our expectations that the economic policy uncertainty (EPU) significantly negatively affects the stock price synchronicity (SYNCH). In order to address the topic from different perspectives, additional tests such as Robustness checks were done to measure the correlation. In other words, the World Uncertainty Index (WUI) was used in another regression model as a proxy for EPU because of the EPU index is constructed from 3 different sources. Different 4 regression models were used in this manner and the variables included are the same as the main regression models that were built in Table (5). Correlation results again align with our proposed expectations that the EPU significantly negatively affects the stock price synchronicity. Additionally, another series of regression models were constructed because of the possibility of a reverse-causality problem which mentions that the correlation may be the vice versa. However, correlation findings are in line with the main hypothesis that was built which implies that when high economic policy is in place, stock price synchronicity (SYNCH) are assumed

to be low because of the negative impact of EPU on price informativeness of the earnings. Last regression models (8 and 9) were based on the interaction terms which correlated the country-specific and firm-specific characteristics in those models. The motivation behind this rationale was to identify the impact of those control variables on the 2-sided correlation (EPU and SYNCH).

Since this research was conducted just after the COVID-19 period, future recommendations in this manner may include conducting this research for the post-COVID period in order to unveil more comprehensive approach to study by examining the uncertainties resulted during that period. Additionally, since existing literature points out two counterarguments about the informativeness of stock prices and synchronicity, doing additional research on the basis of comparing these counter-arguments would be expedient.

7. Appendices

Appendix A*: Economic Policy Uncertainty (EPU) index*



Appendix B: ***Concepts of Uncertainty and Probability***

	Probability is a property of knowledge or belief.	Probability is the property of knowledge in relation to external reality.
Uncertainty refers to a situation that can be measured as probability.	subjectivists (Savage)	rational expectations view (Muth and Lucas)
Uncertainty refers to a situation that cannot be measured as probability.	Keynes	Knight

Appendix C: Average values of synchronicity, R-square and economic policy uncertainty (Table 1).

Panel A: Synchronicity, R-square and economic policy uncertainty in each country

Countries	Synchronicity	R-Square	Economic Policy Uncertainty	Observations
Australia	-2.3932	0.1294	121.8272	4371
Belgium	-2.1713	0.1568	106.6374	570
Brazil	-1.8415	0.1882	188.2413	1451
Canada	-2.4446	0.1214	230.6422	5131
Chile	-1.4427	0.2526	119.2994	468
Croatia	-2.2273	0.1432	141.0143	257
Denmark	-2.2389	0.1469	128.3583	605
France	-2.0495	0.1757	253.6221	2946
Germany	-2.1222	0.1645	200.7407	2998
Greece	-1.5582	0.2428	132.8678	554
Ireland	-2.0505	0.1632	152.3847	105
Italy	-1.8102	0.1907	202.7495	1389
Japan	-1.4825	0.2402	115.0549	27415
Mexico	-1.9083	0.1819	57.20051	550
Netherlands	-1.5586	0.2365	99.37497	525
Singapore	-2.0733	0.1648	158.6325	1499
South Korea	-2.3172	0.1261	163.3859	13105
Spain	-1.5268	0.2426	130.0021	735
Sweden	-2.2330	0.1537	103.7474	2784
United Kingdom	-2.3242	0.1406	159.9099	3624

Panel B: synchronicity, R-square and economic policy uncertainty in each year

Year	Synchronicity	R-Square	Economic Policy Uncertainty	Observations
2010	-1.8783	0.1873	138.5187	6311
2011	-1.4684	0.2437	162.2811	6970
2012	-2.1152	0.1605	155.6116	6131
2013	-2.1298	0.1547	124.4359	6386
2014	-1.8799	0.1976	108.3807	6569
2015	-1.9705	0.1729	122.6525	7039
2016	-1.5665	0.2365	180.8355	7741
2017	-2.4865	0.1147	147.9055	7173
2018	-1.6534	0.2140	141.6885	8891
2019	-2.2509	0.1428	186.8492	7871

NOTE: The table provides the average values of synchronicity, R-square and economic policy uncertainty along with the total number of observations in each country. The sample period is from 2010 to 2019.

Appendix C (continued): Descriptive statistics (Table 2).

Variables	25th Percentile	Mean	Median	75th Percentile	Standard Deviation	Observations
SYNCH	-2.8641	-1.9310	-1.8696	-0.9829	1.2662	71082
EPU	99.7654	148.0052	130.6200	167.0333	57.0357	71082
SIZE	10.7914	12.2559	11.9512	13.5524	2.0125	71082
DIVIDEND	0	1.8003	1.4900	2.7500	1.9125	70382
MBR	0.7337	2.1513	1.2227	2.2944	3.1561	69903
LOSS	0	0.2044	0	0	0.4033	69239
ANALYST	0	3.7211	0	4	6.6135	71082
ASSETGROWTH	-1.6500	10.3923	4.4600	12.9532	33.8562	70305
CAPEX	0.0099	0.0461	0.0264	0.0564	0.0654	70120
CASH	0.0640	0.1933	0.1376	0.2630	0.1812	70980
LEVERAGE	3.7321	20.7172	17.7765	33.0544	18.3159	69798
LEGAL	0	0.2072	0	0	0.4053	71082
GDP	28.0145	28.4766	28.6027	29.2248	0.8305	71082
DEMOCRACY	9.5443	9.5399	10	10	0.9044	71082
GDPGROWTH	0.5763	1.9232	2.0002	2.9074	1.6810	71082
HCAPITAL	3.4973	3.5122	3.5506	3.6557	0.2234	71082
RULELAW	1.2366	1.4013	1.5185	1.6761	0.4294	71082
PRESS	13.3333	20.8074	24	28.6422	10.8715	71082

NOTE: The table provides the descriptive statistics of control variables. The sample period is from 2010 to 2019. All variables are as defined in Section 3.

Appendix C (continued): Difference between the average values of control variables at the 25th and the 75th percentile of economic policy uncertainty (EPU). (Table 3).

Variable	EPU < 25th Percentile	EPU >75th Percentile	Difference
SIZE	12.2239	12.3397	-0.1157***
			(-6.86)
DIVIDEND	1.7939	1.8169	-0.0230
			(-1.43)
MBR	2.1847	2.0652	0.1195***
			(4.49)
LOSS	0.2335	0.1277	0.1057***
			(31.02)
ANALYST	4.0785	2.7866	1.2918***
			(23.38)
ASSETGROWTH	10.5808	9.9019	0.67886**
			(2.38)
CAPEX	0.0482	0.0405	0.0077***
			(14.03)
CASH	0.1858	0.2127	-0.0269***
			(-17.74)
LEVERAGE	21.1698	19.5398	1.6299***
			(10.53)
LEGAL	0.2444	0.1098	0.1346***
			(40.04)
GDP	28.3569	28.7896	-0.4326***
			(-63.88)
DEMOCRACY	9.4359	9.8117	-0.3757***
			(-50.42)
GDPGROWTH	2.0441	1.6069	0.4372***
			(31.23)
HCAPITAL	3.5159	3.5024	0.0134***
			(7.19)
RULELAW	1.3738	1.4731	-0.0993***
			(-27.73)
PRESS	18.7639	26.1517	-7.3878***
			(-85.06)

NOTE: All variables are as described in Section 3. The t-values are in parenthesis. The coefficients with 1% significance are followed by ***, coefficient with 5% by **, and coefficients with 10% by *. The sample period is from 2010 to 2019.

Appendix C (continued): Correlation matrix (Table 4).

No.	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	SYNCH	1.00																	
2	EPU	-0.10	1.00																
3	SIZE	0.40	0.04	1.00															
4	DIVIDEND	0.15	-0.02	0.24	1.00														
5	MBR	-0.10	0.03	0.12	-0.14	1.00													
6	LOSS	-0.21	0.11	-0.31	-0.35	0.13	1.00												
7	ANALYST	0.28	0.13	0.75	0.17	0.08	-0.13	1.00											
8	ASSETGROWTH	-0.06	0.03	0.03	-0.07	0.14	0.00	-0.02	1.00										
9	CAPEX	-0.04	0.08	0.02	-0.06	0.02	0.10	0.06	0.15	1.00									
10	CASH	-0.09	-0.07	-0.19	-0.15	0.23	0.14	-0.17	0.13	-0.13	1.00								
11	LEVERAGE	0.05	0.04	0.09	0.03	-0.03	-0.04	0.11	-0.03	0.07	-0.43	1.00							
12	LEGAL	-0.16	0.21	0.07	0.08	0.14	0.21	0.14	0.13	0.20	-0.03	-0.10	1.00						
13	GDP	0.05	-0.13	-0.01	0.01	-0.09	-0.15	-0.09	-0.07	-0.10	0.13	-0.05	-0.27	1.00					
14	DEMOCRACY	0.09	-0.11	0.02	0.00	0.07	0.00	0.02	0.01	0.01	0.05	-0.06	-0.09	0.45	1.00				
15	GDPGROWTH	-0.15	0.00	-0.03	-0.03	0.01	0.06	0.02	0.06	0.09	-0.04	-0.02	0.18	-0.33	-0.37	1.00			
16	HCAPITAL	-0.08	0.07	-0.13	-0.09	0.00	0.04	-0.11	0.01	0.02	0.08	-0.12	0.26	0.20	-0.02	0.05	1.00		
17	RULELAW	-0.01	-0.06	-0.01	0.05	0.10	0.07	0.01	0.06	0.05	0.07	-0.15	0.42	0.09	0.28	0.01	0.55	1.00	
18	PRESS	0.01	-0.14	0.03	-0.02	-0.05	-0.12	-0.08	-0.04	-0.07	0.03	0.05	-0.13	-0.00	-0.44	-0.10	-0.03	-0.29	1.00

NOTE: The table documents the correlation between variables. The sample period is from 2010 to 2019. All variables are as defined in Section 3.

Appendix C (continued): Relationship between economic policy uncertainty and stock price synchronicity: Baseline analysis (Table 5).

Variables	Model (1)	Model (2)	Model (3)	Model (4)
EPU	-0.0032***	-0.0031***	-0.0010***	-0.0012***
	(-35.91)	(-35.94)	(-10.29)	(-13.82)
SIZE		0.2803***		0.2618***
		(80.23)		(76.85)
DIVIDEND		0.0118***		0.0243***
		(4.67)		(9.80)
MBR		-0.0509***		-0.0355***
		(-27.25)		(-21.22)
LOSS		-0.1518***		0.0089***
		(-12.34)		(0.73)
ANALYST		0.0036***		0.0048***
		(-3.77)		(5.08)
ASSETGROWTH		-0.0021***		-0.0011***
		(-16.54)		(-8.81)
CAPEX		-0.4894***		-0.0441
		(-6.92)		(-0.63)
CASH		0.2739***		0.0616**
		(9.32)		(-2.14)
LEVERAGE		0.0035***		0.0014***
		(12.87)		(5.24)
LEGAL			-0.4689***	-0.5409***
			(-32.99)	(-40.25)
GDP			0.1725***	0.0959***
			(21.17)	(12.59)
DEMOCRACY			0.0431***	0.0914***
			(4.89)	(11.02)
GDPGROWTH			-0.0625***	-0.0609***
			(-15.11)	(-15.95)
HCAPITAL			-0.4756***	-0.0206
			(-16.07)	(-0.74)
RULELAW			0.4207***	0.3640***
			(26.36)	(24.70)
PRESS			0.0239***	0.0249***
			(27.41)	(30.51)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Observations	71082	65552	71082	65552
F-Value	396.29	1017.05	561.80	1063.52
R-Square	0.0935	0.2868	0.1620	0.3385

NOTE: The table reports the relationship between economic policy uncertainty and stock price synchronicity. The t-values based on the heteroscedasticity-robust standard errors are presented in parentheses. The outcome variable is SYNCH (stock price synchronicity) and the key independent variable is EPU (economic policy uncertainty). The sample period is from 2010 to 2019. All variables are as defined in Section 3. The pooled OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

Appendix C (continued): Relationship between (alternate proxy of) economic policy uncertainty and stock price synchronicity (Table 6).

Variables	Model (1)	Model (2)	Model (3)	Model (4)
EPU	-0.9480***	-0.0031***	-0.4827***	-0.8544***
	(-31.05)	(-35.94)	(-14.43)	(-27.66)
SIZE		0.2872***		0.2632***
		(82.68)		(77.55)
DIVIDEND		0.01547***		0.0261***
		(6.10)		(10.58)
MBR		-0.0459***		-0.0330***
		(-25.68)		(-20.21)
LOSS		-0.1737***		-0.0070
		(-14.31)		(-0.58)
ANALYST		0.0051***		0.0050***
		(-5.28)		(5.26)
ASSETGROWTH		-0.0022***		-0.0012***
		(-17.61)		(-9.46)
CAPEX		-0.7021***		-0.2107***
		(-10.08)		(-3.06)
CASH		-0.2462***		-0.0963***
		(8.46)		(-3.37)
LEVERAGE		0.0032***		0.0012***
		(11.88)		(4.76)
LEGAL			-0.4356***	-0.4492***
			(-29.92)	(-32.53)
GDP			0.1723***	0.1000***
			(21.13)	(13.16)
DEMOCRACY			0.0683***	0.1285***
			(7.90)	(15.79)
GDPGROWTH			-0.0626***	-0.0613***
			(-15.03)	(-15.93)
HCAPITAL			-0.4878***	-0.0278
			(-16.42)	(-0.99)
RULELAW			0.3823***	0.2689***
			(23.45)	(17.75)
PRESS			0.0246***	0.0246***
			(29.45)	(31.00)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Observations	71082	65552	71082	65552
F-Value	377.60	1060.20	561.05	1098.19
R-Square	0.0884	0.2911	0.1631	0.3441

NOTE: The table reports the relationship between (alternate proxy of) economic policy uncertainty and stock price synchronicity. The t-values based on the heteroscedasticity-robust standard errors are presented in parentheses. The outcome variable is SYNCH (stock price synchronicity) and the key independent variable is EPU (economic policy uncertainty). The sample period is from 2010 to 2019. All variables are as defined in Section 3. The pooled OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

Appendix C (continued): Relationship between economic policy uncertainty and future stock price synchronicity (Table 7).

Variables	Model (1)	Model (2)	Model (3)	Model (4)
EPU	-0.0047***	-0.0031***	-0.0021***	-0.0023***
	(-32.25)	(-35.94)	(-12.49)	(-15.08)
SIZE		0.3911***		0.3742***
		(67.14)		(64.43)
DIVIDEND		0.0145***		0.0369***
		(3.48)		(8.77)
MBR		-0.0668***		-0.0426***
		(-21.13)		(-14.22)
LOSS		-0.3060***		-0.0856***
		(-13.56)		(-3.80)
ANALYST		-0.0136***		-0.0026*
		(-8.98)		(-1.74)
ASSETGROWTH		-0.0021***		-0.0005*
		(-7.64)		(-1.95)
CAPEX		-1.1847***		-0.5456***
		(-8.29)		(-3.85)
CASH		0.3844***		0.0831
		(7.03)		(-1.53)
LEVERAGE		0.0048***		0.0018***
		(10.34)		(3.99)
LEGAL			-0.6006***	-0.7832***
			(-22.98)	(-30.52)
GDP			0.2578***	0.1438***
			(19.68)	(11.74)
DEMOCRACY			0.0083	0.0754***
			(0.54)	(5.17)
GDPGROWTH			-0.0892***	-0.0885***
			(-13.95)	(-14.94)
HCAPITAL			-0.4945***	0.1770***
			(-9.97)	(3.7)
RULELAW			0.4478***	0.3406***
			(17.02)	(13.67)
PRESS			0.0262***	0.0269***
			(18.31)	(20.02)
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Observations	67954	63146	67954	63146
F-Value	829.92	994.45	765.43	904.27
R-Square	0.1562	0.2844	0.1974	0.3182

NOTE: The table reports the relationship between economic policy uncertainty and one-period ahead stock price synchronicity. The t-values based on the heteroskedasticity-robust standard errors are presented in parentheses. The outcome variable is SYNCH (stock price synchronicity) and the key independent variable is EPU (economic policy uncertainty). The sample period is from 2010 to 2019. All variables are as defined in Section 3. The pooled OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

Appendix C (continued): Impact of firm-level characteristics on the relationship between synchronicity and economic policy uncertainty (Table 8).

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
EPU	-0.0028***	-0.0006***	-0.0014***	-0.0016***	-0.0011***	-0.0013***	-0.0015***	-0.0018***	-0.0013***
	(-6.48)	(-5.60)	(-13.55)	(-16.11)	(-9.95)	(-14.25)	(-14.20)	(-16.40)	(-10.25)
SIZE*EPU	0.0003***								
	(-9.57)								
DIVIDEND*EPU		-0.0003***							
		(-9.11)							
MBR*EPU			0.0008***						
			(3.64)						
LOSS*EPU				-0.0856***					
				(-3.80)					
ANALYST*EPU					-0.0002***				
					(-2.62)				
ASSETGROWTH*EPU						0.0001***			
						(3.76)			
CAPEX*EPU							0.0055***		
							(4.98)		
CASH*EPU								0.0037***	
								(9.15)	
LEVERAGE*EPU									0.0001
									(0.83)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65552	65552	65552	63146	65552	65552	65552	65552	65552
F-Value	1040.95	1037.65	1040.33	904.27	1035.07	1034.77	1033.82	1038.73	1033.85
R-Square	0.3394	0.3395	0.3393	0.3182	0.3386	0.3387	0.3388	0.3393	0.3385

NOTE: The table reports the impact of firm-level characteristics on the relationship between economic policy uncertainty and stock price synchronicity. The t-values based on the heteroskedasticity-robust standard errors are presented in parentheses. The sample period is from 2010 to 2019. All variables are as defined in Section 3. The pooled OLS regression model is used. The symbols *, **, *** correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

Appendix C (continued): Impact of country-level characteristics on the relationship between synchronicity and economic policy uncertainty (Table 9).

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
EPU	-0.0010***	0.0992***	0.0155***	-0.0019***	-0.0039***	0.0024***	-0.0028***
	(-9.43)	(-5.60)	(-14.95)	(-12.50)	(-3.83)	(11.33)	(-13.68)
LEGAL*EPU	-0.0006***						
	(-3.70)						
GDP*EPU		-0.0035***					
		(-19.39)					
DEMOCRACY*EPU			-0.0017***				
			(-16.36)				
GDPGROWTH*EPU				-0.0856***			
				(-3.80)			
HCAPITAL*EPU					0.0007***		
					(2.62)		
RULELAW*EPU						-0.0027***	
						(-19.29)	
PRESS*EPU							0.0007***
							(8.20)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	65552	65552	65552	63146	65552	65552	65552
F-Value	1035.66	1064.17	1057.53	1035.72	1033.89	1058.01	1042.19
R-Square	0.3387	0.3432	0.3420	0.3389	0.3386	0.3428	0.3393

NOTE: The table reports the impact of country-level characteristics on the relationship between economic policy uncertainty and stock price synchronicity. The t-values based on the heteroskedasticity-robust standard errors are presented in parentheses. The sample period is from 2010 to 2019. All variables are as defined in Section 3. The pooled OLS regression model is used. The symbols ∗, ∗∗, ∗∗∗ correspond to $p < 0.1$, $p < 0.05$, $p < 0.01$, respectively.

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