Impact of Economic Policy Uncertainty on the Indian Stock Market : An Empirical Investigation

Naman Kalra¹ Gaurav Gupta²

Abstract

Purpose : This study examined the impact of economic policy uncertainty on the Indian stock market. Economic policy uncertainty showed that uncertainties persist in the economy and may affect economies, industries, and companies. The stock market of any economy is very volatile, and it can be easily affected by any small changes in the economy on a national and international level. We argued that EPU also significantly affected the Indian stock market.

Design/Methodology/Approach : We analyzed the relationship of economic policy uncertainty with stock prices and market volatility using linear and logarithmic regression.

Findings : Our study found that economic policy uncertainty had a positive correlation with market volatility and a significant negative relationship with returns on the Indian stock market. Further, EPU had negative impacts on the performance of firms. We also found that economic policy uncertainty did not have a similar impact on every sector. Sectors dealing with discretionary products and services like automobiles were more negatively impacted than sectors like fast-moving consumer goods and pharmaceuticals.

Practical Implications : An investor must understand the impact of uncertainties on equity investments and different sectors to make sound decisions during such times. This information can be used both by firms and retail investors to act accordingly when the future trajectory of the economy is uncertain. Also, the authorities should try to reduce such risks as these can negatively impact the economic growth of a country.

Originality/Value : This study contributes to the existing literature by examining the impact of economic policy uncertainty on the Indian stock market. Further, this study stated that economic policy uncertainty could be used as a predictive variable in addition to other macroeconomic variables in stock prediction models, making this study unique.

Keywords : economic policy uncertainty, stock market, emerging markets

JEL Classification Codes : D80, E60, G1

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The present state and the near future outlook of the economy and the likelihood of change in economic policies can impact the participants in the economy to rethink their decisions regarding consumption, savings, and investment. They lack confidence during such times and find it difficult to make investment decisions when they are not sure about the likely trajectory of economic policies. Economic Policy Uncertainty (EPU) is a type of economic risk under which the future course of action taken by

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¹*Rating Analyst,* CRISIL Limited, Gurugram, Haryana. (Email: naman.xd@gmail.com)

² Assistant Professor (Corresponding Author), FORE School of Management, Adhitam Kendra, B-18, Qutub Institutional Area, New Delhi - 110016. (Email : gaurav22lbs@gmail.com ; gaurav.gupta@fsm.ac.in)

the government or institutions of a country is unknown. EPU shows that uncertainties persist in the economy and may affect the economies, industries, and companies. The stock market of any economy is very volatile, and it can be easily affected by any small changes in the economy on a national and international level. We argue that EPU also significantly affects the Indian stock market. In the context of stock markets, EPU can be a major source of risk. The stock market participants are one of the most sensitive participants of the economy who quickly react to macroeconomic-level uncertainties. If people believe that there will be a change in the country's economic policy shortly, it might create fear in the minds of individuals and may cause them to delay their spending and investments. Economic or political shocks might also affect the operations, costs, and sales at the firm level. Such uncertainties affect the firms' environment and might lead to a change in their investment activities.

The stock markets are forward-looking and fairly unpredictable. Investors quickly react to news available in the market. Several studies have been carried out to study the impact of EPU on variables like firm profits, corporate investments, cash flows, interest rates, employment inflation, etc. Such factors are also expected to impact stock prices through different channels. A major determinant of a firm's stock price is its capital cost. The overall cost of capital shows a significant percentage of the cost of equity, which is affected by various economic factors. Given all of this, one can expect these factors to impact stock prices through different channels. Also, these factors can be expected to influence the investment behavior of firms as well as retail investors.

As per the Gordon Growth Model (GGM), the price of a stock is simply the present value of its probable future dividends. These dividends are discounted at the cost of equity (K_e) of the respective company. Such economic uncertainties in the environment should change the investors' required returns as the environment is perceived to be riskier. Also, it might make companies retain their earnings rather than pay excessive dividends. Similarly, the capital asset pricing model (CAPM) explains the cost of equity as a function of the risk-free rate, market return, and beta. Such economic uncertainty would also increase systematic risk (beta) and equity risk premiums in the market, increasing the cost of equity. Therefore, it is of great interest to study the effect of EPU on the stock market.

However, it is not easy to predict the probable changes in economic policies. This gap has been removed by Baker et al. (2016) by providing an EPU Index for India. This index is also referred to as the BBD-EPU index. This index measures economic uncertainty based on news articles posted by the major newspapers of India. The seven newspapers included are – the *Hindustan Times, Times of India, Economic Times, Statesman, Indian Express, Hindu, and Financial Express.* These newspapers were scanned to look for key terms like uncertainty, economy, monetary policy, government policy, legislation, central bank, fiscal policy, regulation, deficit, tax, etc. These articles were then scaled by counting the number of articles with such keywords in the same newspaper. The same was repeated for other newspapers, and these scores were normalized. This process was repeated month by month to compute the monthly value of the EPU Index of India. A high value indicates high uncertainty shortly.

Over the years, the EPU Index of India has shown resistance at the value of 50 (Figure 1). For most of the years, it has been range-bound between 50 and 150. It can be observed that the index is mean-reverting over time. Covariance stationarity can be witnessed in the diagram. Although, in some years, it has shown a diversion from its usual range. There have been peaks during the periods when the uncertainty regarding the future likelihood was too high. For example, in 2004, Congress won the elections by a small margin, which led to a significant increase in EPU. During 2007–09, there were fears about the U.S. recession. The global crisis had a last longing impact. Also, the Mumbai 2008 attacks might have contributed to uncertainty during that period. All of these can be considered the reasons for the spikes during that period. We can say that these peaks could be seen during black swan events like the 2007–08 financial crisis and the 2020 COVID-19. The EPU score of India moved with the Global Index till about 2015 (Figure 2).

At the beginning of 2015, divergence could be witnessed between the Indian and global EPU indices. We can say that the economic uncertainties of India have decreased drastically as compared to the rest of the world since





2015. The weight of the countries in the EPU Index is as per their respective GDPs. This means that the global index is heavily dependent on countries like China and the U.S. Over the years, trade tensions have been increasing between these two countries. Therefore, to the best of our knowledge, we can say that the tensions between the U.S. and China could be one of the reasons for the divergence between the Indian and Global EPU indices. Apart from this, Brexit can also be another reason for the divergence.

Economic policy uncertainty is an inevitable part of the economy. No matter how much the government and institutions try, economic risk cannot be eliminated. It not only affects the economic growth of the country but also the mindset of the people. We will focus on the effect of such uncertainties on equity investments. This study is important to ascertain whether the conventions held in the minds of stock market participants are held during such

times or not. This study will help us analyze the effect of EPU on the stock market and learn which industries are more sensitive to it. This will further help us to make sound investment decisions when the expected future EPU is high. There are competing reasons for EPU to be linked to the stock market.

The objective of this study is to investigate the predictability of EPU to stock market returns and market volatility. We will analyze the spillover effects of policy uncertainty on stock markets. Also, we analyze its effect on different sectors to see which industries are more prone to future economic uncertainties. Therefore, the objective of this study is to understand the economic policy uncertainty in India using the 'EPU Index.' Further, we also study and quantify the impact of EPU on the Indian stock market and volatility in the market, and last, we analyze the impact of EPU on stocks of different industries.

Our study finds that EPU has a positive correlation with market volatility and a significant negative relationship with returns in the Indian stock market. Further, EPU has negative impacts on the performance of firms. We also find that EPU does not similarly impact every sector. Sectors dealing with discretionary products and services like automobiles are more negatively impacted than FMCG and pharmaceuticals. An investor must understand the impact of uncertainties on equity investments and different sectors to make sound decisions during such times. It must be noted that the list of sectors that we considered is not exhaustive because investing during such events is an enormous topic. That being said, these results can give us an idea of how to proceed with our stock investments when future uncertainties are high. In addition to all of this, investors must keep in mind which industries may patronize more if such events impact their earnings. One final recommendation for investors is to understand that sectors that may not do well during such times may perform better than others when the economy recovers, and vice-versa. That being said, the participants in the economy should keep all of this in mind while constructing their portfolios and making investment decisions. Therefore, EPU can be used as an additional predictive variable in addition to other macroeconomic variables in stock prediction models. It can significantly improve their forecasting ability.

Literature Review

The EPU Index has been gaining importance over the years. It has been a popular choice for research studies in countries outside India. Most research papers discuss its impact on firm-level investments, corporate profits, firm cash holdings, M&As, and the volatility index. In this study, we contribute to the literature by particularly focusing on the Indian stock market. The fact that the EPU affects macroeconomic variables and firm-related factors, it should ideally significantly impact the stock market as well. EPU impedes the growth of a firm through different channels. It plays a significant role in slowing down an economy and leads to unemployment as well. It affects the GDP and fixed investment in the Indian market. Also, it increases a firm's capital cost, negatively impacting its budgeting decisions. As a result, the firms defer investment in new projects and stop hiring employees when the EPU is high (Bhagat et al., 2016).

A significant relationship exists between EPU and macroeconomic conditions for firm-level investments (Gupta et al., 2022; Gupta, 2022; Gupta & Mahakud, 2019, 2020; Wang et al., 2014). More specifically, it has been found that the EPU significantly affects the firm's investment decision and makes them delay their investments. It has a significant long-term negative effect (Kang et al., 2014). Firms delay their investments during economic uncertainties. A strong positive relationship exists between EPU and a firm's cash holdings. Such uncertainties have a detrimental effect on the economy as a whole (Phan et al., 2019).

It also impedes the growth of a firm through mergers & acquisitions. Evidence shows that it has a negative relationship with M&A deals of a firm. This is true, especially for firms whose products and stock returns are highly sensitive to economic policies (Bonaime et al., 2018). Although this uncertainty does not affect very large firms, evidence shows that small firms are more vulnerable to uncertainty than big ones. Overall, uncertainty has a

negative effect on investment, and this effect increases even more during a financial crisis (Panagiotidis & Printzis, 2020). EPU exhibits a negative correlation, especially with small-cap growth companies. It can also increase financing and production costs for a company. Moreover, high EPU reduces confidence in the minds of individuals for policymakers. It has been suggested to have a more robust and transparent policy system to avoid the spillover effects of uncertainties (Paule-Vianez et al., 2020).

Apart from affecting firms, such uncertainties can alter the decisions of people to consume, spend, and invest. These shocks influence financial markets and the real GDP growth of India. A higher EPU leads to a slowdown in GDP growth and investment activities. Financial markets account for upcoming uncertainties in advance (Priyaranjan & Pratap, 2020). Financial markets are sensitive to national uncertainties because they influence macroeconomic variables like output, GDP, employment, interest rates, production, and capital inflows/outflows. All of these impact the economy as a whole and the outlooks of the economic agents and, therefore, the expected stock returns. The momentum effects in the stock market are negative when EPU is high. The evidence shows a significant relationship between economic uncertainty and investor sentiment. It leads to an increase in fear in the minds of investors (Rehman & Apergis, 2019).

Excess stock returns increase when EPU is high. There is a direct linkage between EPU and the downside risk of stocks as well as the volatility. This has been tested for Asian stock markets (Chiang, 2019). For India and the U.S., EPU affects stock returns from different channels, including cash flow and discount factors. Although the discount rate factor shows the most significant impact, the impact is asymmetrical. It does not impact every country in a symmetric way (Phan et al., 2018). In addition to its impact on stock prices, a higher EPU value leads to greater volatility in the stock markets. The predictability of stock market movements can be significantly improved if EPU is taken as a factor in addition to the common macroeconomic variables generally considered for forecasting.

Further, the increase in volatility leads to a higher cost of equity (Liu & Zhang, 2015). Several studies talk about the positive relationship between EPU and volatility in the financial markets. There is evidence of persistent volatility whenever there are spikes in the EPU Index. Apart from stock markets, it also significantly affects the commodity market. It impacts gold, crude oil, and crops significantly. In addition to this, it also impacts interest rate volatility, as economic uncertainty is directly linked to monetary policy (Shaikh, 2019). Apart from impacting stock prices and volatility, EPU also affects liquidity in the market. It plays a crucial role in determining liquidity during uncertain times. The reason behind this can be attributed to the effect of uncertainty in investors' minds (Debata & Mahakud, 2018). Other studies highlighted the changes in stock market behavior due to firm-specific and macroeconomic factors (Ashwani & Sheera, 2018; Ashraf & Baig, 2019; Jha et al., 2019; Kanojia & Malhotra, 2021; Pandey & Pattanayak, 2018; Parthasarathy, 2019; Srivastava et al., 2022).

Data and Variables

Data

In this paper, the proxy for EPU has been taken as the 'EPU Index' of India from www.policyuncertainty.com. This index was built for India from 2003 onwards. We sourced monthly data from the official website for the period from 2003–2021. This is the main variable for our study. The proxy for stock prices has been taken as the 'Nifty 100' index and has been directly sourced from the official website of the National Stock Exchange (NSE). The stock returns (%) were calculated by taking the closing prices of the Nifty 100 Index. Similarly, the proxy for stock returns for different industry sectors has taken their respective thematic indices provided by Nifty. Nifty has a sectoral index for different industry sectors. Another variable in our study is market volatility. The proxy for that has been taken as the India VIX (NIFVIX). It measures participants' expectations of the market of volatility in the



next 30 calendar days. The adjusted monthly data for NIFIVX has been sourced from Thomson Reuters' database.

Variables

Regression analysis will be conducted for the following variables. It must be noted that EPU is a lagged variable. Therefore, the EPU Index value for (t-1) i-e the immediately preceding month has been taken to conduct the analysis. Figure 3 shows the main variables of this study.

Hypothesis Formation

During times of future economic uncertainty, investors lack confidence as they are not sure about the likely trajectory of the economic policies. This forces them to hold back their savings and impacts their investment decisions. Also, investors might likely pull their money from the markets during such times. The rationale behind taking stock prices as a variable is to analyze the impact of EPU on stock prices directly. Considering this argument, this study proposes the following hypotheses :

- Solution Hotel and stock returns.
- Solution Hal: There exists a significant negative relationship between EPU and stock returns.

Apart from affecting the stock prices, future economic uncertainty is also expected to increase volatility in the market as investors might be unsure of how to react to the news. It is well known that stock markets quickly react to news-based facts. So, ideally, future possible economic uncertainty should lead to an increase in volatility in the market. Moreover, several studies talk about the linkage between liquidity and EPU. This compels us to believe that there is a relationship between MV and EPU, and this study proposes the following hypotheses :

by **H02**: There is no relationship between EPU and market volatility (MV).

Solution Ha2: There exists a significant positive relationship between EPU and market volatility (MV).

We'll further analyze the impact of EPU on stock returns of different company sectors (Figure 4). To facilitate the same, a similar regression analysis will be conducted with a log-linear model. This time, the dependent



variable will be the respective Nifty Sector Index (NSI) of the sector being analyzed. Nifty has different indices for each company sector. To quantify the impact of EPU on each sector, its respective Nifty index has been considered. The different sectors being analyzed are represented in Figure 4.

The data for the same has been sourced from the Thomson Reuters database. Some of the sectoral indices are old; whereas, some came into existence in the latter half of 2011. To draw a fair comparison, it is essential to have a common period for all sectors. Only then can the individual impact of EPU on the stock returns of each of them be compared. So, the data for all sectors have a period beginning from January 2012 till April 2021. The regression analysis for this is similar to what we did earlier for SR and MV and proposes the following hypotheses :

Solution Ho3: EPU is not expected to impact different sectors differently.

Ha3: EPU is expected to impact different sectors differently.

Model and Methodology

The primary purpose of this research is to analyze the effect of EPU on the stock market through different channels. To facilitate the same, we adopted a qualitative approach. For this, we'll analyze the relationship of EPU with stock prices and market volatility using regression analysis. To assess the relationship between the variables, various statistical techniques have been adopted. The regression analysis has been used to find evidence for a significant relationship between the variables complemented by their respective correlations with EPU and scatter plot diagrams. The validity of the hypothesis has been tested with a conventional p-value test. For the same, we will be assuming a confidence interval of 95%. This means we'll be expecting a p-value that is less than 0.05. To adopt these methods, the following assumptions have been taken into account :

Solution There exists a linear relationship between EPU and the other variables.

- Sepusition of the second secon
- ♦ The expected value of the residual term is zero.
- Solution The variance of the residual term will be constant for all data points and is independently distributed.
- ✤ The distribution of the residual terms is normal.

Regression Equation

There exists a high-scale difference between our variables. If we simply conduct regression with absolute values of the EPU Index and dependent variables, it would be model misspecification. This might give us unreliable results. A natural log regression model has been used to soothe the high scale difference. This will also allow us to draw a fair comparison between variables and compare them in terms of percentage rather than absolute terms. The general form of the regression equation that will be used further in our study is as follows :

 $\ln(Y) = b_0 + b_1 \ln(X) + E$ (1)

where, $\ln(Y) = \text{Natural log of dependent variable}$, $b_0 = \text{Intercept}$, $b_1 = \text{Coefficient of } X$, $\ln(X) = \text{Natural log of independent variable}$, E = Residual (error term).

The regression equation to examine the relationship between EPU and stock returns is as follows :

$$\ln(SR_{t}) = b_{0} + b_{1}\ln(EPU_{t-1})$$
(2)

where, SR is the stock return.

The regression equation for testing the relationship between EPU and market volatility is as follows :

 $\ln(MV_{t}) = b_{0} + b_{1}\ln(EPU_{t-1})$ (3)

The regression equation to examine the impact of EPU on different sectors is as follows :

$$\ln(NSI_t) = b_0 + b_1 \ln(EPU_{t-1}) \tag{4}$$

where, Nifty Sector Index (NSI) will be replaced by the index of the respective sector being analyzed.

Analysis and Results

The regression results provided in Table 1 of hypothesis 1 are significant as the *p*-value is negligible. A negative correlation exists between EPU and stock market returns; 64.68% of the variation in stock market prices can solely be explained by the EPU, which can be inferred by the equation in Table 1. When the EPU Index increases by 1%, Nifty Index falls by approximately 0.43%. This is most likely because when participants of the economy are uncertain about the future course of action that the government and other institutions will take up, they delay their investments or even withdraw money from the markets. This negative relationship can also be witnessed in the scatter plot diagram (Figure 5). It shows that our model is a good fit as the data points are very close to the regression line (curve, in this case, as we have used logarithmic regression). The regression line is downward sloping, which signifies a negative relationship. Therefore, the results presented in Table 1 confirm that H01 is rejected and Ha1 is accepted.

$\ln(SR_t) = 5.7617 - 0.4394 \ln(EPU_{t-1})$								
Regress	Intercept	SR _t						
Multiple <i>R</i>	0.646849	Coefficients	4.7617314	-0.4394418				
R Square	0.418413	Standard Error	0.0885073	0.0449242				
Standard Error	0.10854	t - Stat	53.80045	-9.7818602				
Observations	135	<i>p</i> -value	3.917	2.349				

Table 1. Regression Output for SR and EPU



Table 2. Regression Output for MV and EPU

$\ln(MV_{t}) = 0.828652 + 0.21648\ln(EPU_{t-1})$								
Regression	Intercept	MV _t						
Multiple R	0.37893	Coefficients	0.8286516	0.21648				
R Square	0.143588	Standard Error	0.0903178	0.045843				
Standard Error	0.11076	t - Stat	9.1748458	4.722192				
Observations	135	<i>p</i> -value	7.55	5.84				

Further, the regression results of the second hypothesis are significant as the *p*-value is negligible and presented in Table 2. There exists a positive relationship between market volatility and EPU Index. When the latter falls by 1%, MV increases by 21.64%; the EPU Index can explain a 14.35% variance in MV and can be inferred by the equation in Table 2. We have statistically proven that the upcoming uncertainty in economic policies increases stock market volatility. The scatter plot diagram can also show this significant relationship (Figure 6). This time, the regression line is upward-sloping, unlike what we saw in Figure 5. This signifies the positive relationship between MV and EPU. Overall, the results presented in Table 2 confirm that H02 is rejected and Ha2 is accepted.



Table 3. Regression Output for Different Nifty Sectors and EPU

Sector	R ²	Multiple R	Coefficient	Intercept	Std. Error	<i>p</i> -value	Significant?
							(α = 0.01)
Automobile	0.628695	0.792903	-0.55208	4.930865	0.093496	2.79	Yes
Banks	0.406929	0.63791	-0.50344	5.242253	0.125229	5.08	Yes
Financial Services	0.355218	0.596001	-0.50348	4.869267	0.139768	5.17	Yes
FMCG	0.359185	0.5993205	-0.37276	5.060633	0.102588	3.67	Yes
IT	0.301156	0.5487771	-0.40468	4.8328	0.127018	4.52	Yes
Media	0.431346	0.6567693	-0.4205	3.63688	0.099481	5.23	Yes
Pharmaceutical	0.349104	0.5908501	-0.32716	4.582975	0.092047	8.71	Yes
Energy	0.215384	0.4640948	-0.28718	4.583929	0.112936	2.89	Yes

The results in Table 3 further imply the linkage between the stock market and EPU. Different sectors are impacted differently by EPU. Assuming a confidence interval of 99%, we can say that all Nifty Sectoral Indices have a significant relationship with EPU Index as the *p*-value is less than 0.01 for all. The individual impact of EPU on different sectors can be observed by looking at their respective *R*-square values and the magnitude of the coefficient. As expected, all of them have a negative coefficient. This is due to the negative relationship between market returns and EPU. It can be observed that some sectors are impacted more than others ; whereas some revolve around the same range. The automobile sector has the highest R^2 and negative coefficient of 62.86% and -0.55208; whereas, FMCG and pharma have coefficients of -0.37276 and -0.32716, respectively. This proves that EPU most heavily impacts the auto sector. This also makes logical sense as automobile consumption is highly discretionary. They have a relatively high elasticity of demand.

In times of any crisis, usually, the auto sector is the first one to take a hit. When times are uncertain, any individual will postpone consuming such discretionary products rather than something like FMCG or

pharmaceutical products. The logic behind this is obvious, we need healthcare to survive, and we are very much less likely to avoid pharmaceutical products even when the economy declines. The same applies to FMCG products. This is the reason that both of them have comparatively low R^2 and coefficient values. This same logic can be applied to the energy sector as well. Oil and gas are other crucial commodities. These products are essential for daily survival and business. Therefore, these firms are characterized by price inelasticity as opposed to the automobile sector. Another sector with a relatively high negative coefficient is the banking sector.

The banking sector has the second highest negative coefficient, -0.50344, with an R^2 of 40.69%. This is another sector that is heavily impacted by EPU. The most likely reason behind this is monetary policy involvement in EPU. When there is an imbalance in the economy, the central bank might resort to meddling with the monetary policy. This might impact the banks directly. Also, during uncertain times, people might withdraw their savings or might default on loans. We have seen in the past how financial firms have been left devastated by events like the 2008 recession and several banking scams. Finally, the results presented in Table 3 confirm that H03 is rejected and Ha3 is accepted.

Conclusion

Our findings suggest that EPU has a strong ability to predict stock returns and market volatility. We have empirically tested this relationship and quantified its impact using logarithmic regression analysis. EPU can be considered a useful source for understanding the stock market dynamics. We also find that EPU affects different industries differently. An automobile company stock has a stronger negative relationship with EPU than FMCGs and pharmaceuticals. This study suggests that participants of the markets should consider this additional risk and use it to form diversification strategies or events to speculate in the markets. For example, shorting automobile stocks might be a good idea if an investor anticipates upcoming policy uncertainty. People may not stop consuming FMCG products, but they might switch to cheaper alternatives. Therefore, it's a good idea to bet on discount retailers as people might switch to discounted alternatives to the current essentials used by them. Although, it must be noted that different uncertainties or crises might affect these sectors differently. All such events are unique and may not have the same suggestions. For example, food and beverages are less likely to suffer during uncertain times because people need them, just like healthcare and FMCG products. But, during the COVID-19 pandemic, even food and restaurants suffered losses. During the 2008 recession, banks and financial services suffered as it was a financial crisis, but this may not be the case with other events. Therefore, every event is unique with different implications and should be analyzed separately.

Managerial and Theoretical Implications

Our empirical results are relevant for both investors and policymakers. Regulators of the economy may consider these results to reduce unnecessary uncertainties in the minds of economic agents as they can be useful to maintain stability in financial markets. Transparency in policies will lead to less fear in people's minds, leading to less market volatility, and will not impede the economy's growth. Also, practitioners can use these results to assess and study the future performance of stock markets. In addition to all of this, investors must keep in mind which industries may patronize more if such events impact their earnings. One final implication for investors is understanding that the sectors that may not do well during such times may perform better than others when the economy recovers and vice-versa. That being said, the participants of the economy should keep all of this in mind while constructing their portfolios and making investment decisions. Therefore, EPU can be used as an additional predictive variable in addition to other macroeconomic variables in stock prediction models. It can significantly improve their forecasting ability.

Limitations of the Study and Scope for Further Research

The major limitation of this study is that it does an aggregate analysis of EPU and the Indian stock market. Therefore, this study can be extended by separating the sample based on the crisis period and the COVID period to examine the effect of EPU on the Indian stock market in different periods.

Authors' Contribution

Dr. Gaurav Gupta and Naman Kalra mutually initiated the idea to examine the effect of EPU (economic policy uncertainty) on India's stock market. Dr. Gaurav Gupta explored the methodology and data collection sources. Mr. Naman Kalra and Dr. Gaurav Gupta extracted research papers to figure out the research gap and justify the need for this study with a strong literature review. Dr. Gaurav Gupta verified the analytical methods and supervised the study. Naman Kalra performed the empirical analysis and wrote the results. He wrote the manuscript under the supervision of Dr. Gaurav Gupta.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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About the Authors

Naman Kalra is working as a Rating Analyst at CRISIL Limited, Gurugram, Haryana. He has completed his PGDM from FORE School of Management, New Delhi. He has a strong inclination toward the field of finance, and some key areas of his interest encompass business valuation, credit risk assessment, and investment management, to name a few.

Gaurav Gupta is an Assistant Professor of finance and accounting at the FORE School of Management, New Delhi. Earlier, he was an Assistant Professor of finance and accounting at the Vellore Institute of Technology, Vellore. He has pursued a PhD from the Indian Institute of Technology, Kharagpur. His areas of interest include finance, economics, and accounting. He has published several research papers in reputed national and international journals. Dr. Gaurav Gupta is the corresponding author of this paper.