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Volatility in the Equity Stock Market in India from 2019 to 2024: An Empirical Analysis

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Abstract: This research investigates the volatility and fluctuations in the Indian equity stock market from 2019 to 2024, a period characterized by unprecedented global and domestic challenges. The Indian stock market, like many emerging markets, experienced heightened volatility due to a confluence of events, including the COVID-19 pandemic, geopolitical tensions, economic reforms, and shifts in global financial conditions. The study employs advanced econometric models, including GARCH (Generalized Autoregressive Conditional Heteroskedasticity) and event study analyses, to capture the time-varying nature of market volatility and to identify the key factors driving these fluctuations.

Our findings reveal that the COVID-19 pandemic triggered the most significant spikes in volatility, particularly during the early months of 2020, as uncertainty regarding the pandemic's impact on the economy led to sharp market corrections and investor panic. Additionally, the study highlights the influence of macroeconomic variables such as GDP growth, inflation, and monetary policy changes on market behavior. The paper also explores the role of investor sentiment and market liquidity in exacerbating volatility during crisis periods.

The results provide valuable insights into the dynamics of the Indian equity market, offering implications for investors seeking to manage risk and for policymakers aiming to enhance market stability. The study underscores the need for robust risk management strategies and proactive regulatory measures to mitigate the adverse effects of such volatility, especially in an increasingly interconnected global financial environment.

Keywords: Equity Stock Market, Volatility, India, COVID-19, Economic Reforms, 2019-2024

1. Introduction

1.1 Background

The Indian equity stock market has witnessed substantial volatility from 2019 to 2024, a period marked by significant economic disruptions and rapid changes in the global and domestic landscapes. Volatility, which refers to the degree of variation in stock prices over time, is a critical measure for investors and market participants, as it directly impacts the risk and return profiles of investment portfolios. The higher the volatility, the greater the uncertainty in the market, which can lead to sharp fluctuations in asset prices. Understanding the causes and implications of this volatility is essential for investors, policymakers, and researchers, especially in an emerging market like India, where economic and financial conditions can be more susceptible to external shocks.

The period between 2019 and 2024 has been characterized by a series of unprecedented events that have significantly influenced market dynamics. One of the most notable events was the COVID-19 pandemic, which emerged in late 2019 and rapidly escalated into a global health crisis by early 2020. The pandemic's impact on the global economy was profound, leading to widespread economic lockdowns, disruptions in global supply chains, and a sharp contraction in economic activity. These factors created an environment of extreme uncertainty, which was reflected in the stock markets worldwide, including India.

In addition to the pandemic, other global and domestic factors also contributed to the heightened volatility in the Indian equity market during this period. Geopolitical tensions, such as the ongoing trade disputes between major economies and regional conflicts, added to the uncertainty. Changes in monetary policy, both in India and globally, played a significant role in influencing investor sentiment and market behavior. The Reserve Bank of India's (RBI) monetary policy actions, particularly in response to the pandemic, had a direct impact on market liquidity, interest rates, and investor confidence.

Economic reforms implemented by the Indian government during this period also had a notable effect on the equity market. For instance, the introduction of structural reforms aimed at improving the ease of doing business, liberalizing foreign direct investment (FDI) policies, and enhancing the digital economy were intended to boost long-term economic growth. However, these reforms also introduced short-term volatility as the market adjusted to the new regulatory and economic environment.

1.2 Objectives

Given the backdrop of these significant events and their impact on the financial markets, the primary objective of this study is to analyze the volatility patterns in the Indian equity stock market from 2019 to 2024. This research aims to provide a comprehensive understanding of the key drivers of volatility during this period, focusing on the following specific goals:

1. Identifying the Key Drivers of Volatility: The study seeks to identify and quantify the major factors contributing to market volatility. These factors may include global economic events, domestic policy changes, macroeconomic indicators, and investor behavior.
2. Assessing the Impact of Major Events on Market Behavior: A particular focus will be on analyzing how specific events, such as the COVID-19 pandemic, geopolitical tensions, and monetary policy shifts, influenced market volatility. The study will examine the immediate and long-term effects of these events on stock prices and investor sentiment.
3. Providing Recommendations for Managing Market Risk: Based on the findings, the study aims to offer practical recommendations for investors and policymakers to better manage market risk in the face of high volatility. This includes strategies for risk management, portfolio diversification, and policy interventions to stabilize the market.

1.3 Research Questions

To achieve the objectives outlined above, this research will address the following key questions:

- What were the key factors contributing to volatility in the Indian equity market during this period? This question seeks to identify the primary sources of market fluctuations, including economic, political, and social factors, as well as the role of market participants and investor psychology.
- How did specific events, such as the COVID-19 pandemic, influence market volatility? This question aims to explore the causal relationship between major events and market behavior, focusing on how these events triggered or amplified volatility in the stock market.
- What are the implications of this volatility for investors and policymakers? This question addresses the broader impact of market volatility on investment strategies, risk management practices, and regulatory

policies. The study will consider how investors and policymakers can respond to and mitigate the effects of volatility in the future.

2. Literature Review

2.1 Introduction to Market Volatility

Market volatility is a critical aspect of financial markets, reflecting the extent of price fluctuations over a period of time. In the context of the equity stock market, volatility is often used as a measure of the risk associated with investment returns. The study of volatility is crucial because it affects both the risk-return trade-off for investors and the broader stability of financial markets. The literature on market volatility is extensive, covering a range of theories, empirical findings, and methodologies.

2.2 Volatility in Emerging Markets

Emerging markets, including India, tend to exhibit higher volatility compared to developed markets due to a variety of factors such as economic instability, political uncertainty, and lower market liquidity. Studies have shown that volatility in emerging markets is often driven by external shocks, such as changes in global financial conditions, and internal factors, including domestic economic policies and political events.

References:

- **Bekaert, G., & Harvey, C. R. (1997). Emerging equity market volatility. *Journal of Financial Economics*, 43(1), 29-77. Link**
- **Aggarwal, R., Inclan, C., & Leal, R. (1999). Volatility in emerging stock markets. *Journal of Financial and Quantitative Analysis*, 34(1), 33-55. Link**

2.3 Impact of COVID-19 on Global and Indian Equity Markets

The COVID-19 pandemic has been one of the most significant global events in recent history, with profound effects on financial markets. The pandemic induced a high level of uncertainty, leading to unprecedented market volatility. Several studies have analyzed the impact of the pandemic on global financial markets, with a focus on the rapid sell-offs and subsequent recoveries. In the Indian context, the COVID-19 pandemic led to sharp declines in stock prices during the early months of 2020, followed by a period of recovery as markets adjusted to the new economic realities.

The literature highlights the pandemic's impact on various sectors, with some sectors (e.g., technology, pharmaceuticals) benefiting from the crisis, while others (e.g., travel, hospitality) were severely affected. The response of monetary authorities, including interest rate cuts and liquidity injections, played a crucial role in stabilizing markets.

References:

- **Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). COVID-induced economic uncertainty. *NBER Working Paper No. 26983*. Link**
- **Zaremba, A., Kizys, R., Aharon, D. Y., & Demir, E. (2020). Infected markets: Novel coronavirus, government interventions, and stock return volatility around the globe. *Finance Research Letters*, 35, 101597. Link**
- **Narayan, P. K., Phan, D. H. B., & Liu, G. (2021). COVID-19 lockdowns, stimulus packages, travel bans, and stock returns. *Finance Research Letters*, 38, 101732. Link**

2.4 Geopolitical Tensions and Market Volatility

Geopolitical tensions are another significant driver of market volatility, particularly in emerging markets. Events such as trade wars, regional conflicts, and political instability can lead to increased uncertainty and risk aversion among investors, resulting in sharp movements in asset prices. The literature on geopolitical risk and financial markets suggests that such events often lead to short-term spikes in volatility, followed by a period of normalization as markets digest the new information.

In the Indian context, geopolitical events such as the India-China border tensions and global trade disputes have had noticeable effects on market behavior. These events contribute to risk-off sentiment, where investors seek safety in less risky assets, leading to increased volatility in the equity market.

References:

- **Caldara, D., & Iacoviello, M. (2018). Measuring geopolitical risk. *FRB International Finance Discussion Paper No. 1222*. Link**
- **Antonakakis, N., Chatziantoniou, I., & Filis, G. (2014). Dynamic spillovers of oil price shocks and economic policy uncertainty. *Energy Economics*, 44, 433-447. Link**
- **Bekaert, G., Hoerova, M., & Lo Duca, M. (2013). Risk, uncertainty, and monetary policy. *Journal of Monetary Economics*, 60(7), 771-788. Link**

2.5 Role of Monetary Policy in Influencing Market Volatility

Monetary policy, particularly in the form of interest rate changes and liquidity injections, has a significant impact on market volatility. In the aftermath of the COVID-19 pandemic, central banks worldwide, including the Reserve Bank of India (RBI), implemented aggressive monetary easing to support economic recovery. The literature indicates that such policy measures can reduce market volatility by providing liquidity and boosting investor confidence. However, sudden changes in monetary policy, such as unexpected rate hikes, can lead to increased volatility as markets adjust to the new interest rate environment.

In India, the RBI's actions, including rate cuts and targeted long-term repo operations (TLTROs), were aimed at maintaining financial stability and supporting economic growth. The literature explores the effectiveness of these measures in stabilizing the market and mitigating the impact of external shocks.

References:

- **Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy*, 39, 195-214. Link**
- **Clarida, R., Galí, J., & Gertler, M. (2000). Monetary policy rules and macroeconomic stability: Evidence and some theory. *The Quarterly Journal of Economics*, 115(1), 147-180. Link**
- **Bhoi, B. B., & Mathew, S. K. (2020). COVID-19 and financial stability in India. *RBI Bulletin*, July 2020. Link**

2.6 Economic Reforms and Stock Market Volatility in India

Economic reforms can have both stabilizing and destabilizing effects on financial markets, depending on how they are perceived by investors. The literature on economic reforms in emerging markets suggests that while reforms aimed at improving economic efficiency and growth potential can enhance market confidence in the long term, they may also lead to short-term volatility as markets adjust to new regulations and policy changes.

In India, the period from 2019 to 2024 saw several significant reforms, including changes to taxation policies, labor laws, and initiatives to boost the digital economy. These reforms were part of the government's broader strategy to improve the ease of doing business and attract foreign investment. However, the initial implementation of these reforms led to market uncertainty, contributing to short-term volatility as investors reassessed their investment strategies in light of the new regulatory environment.

References:

- **Aghion, P., & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica*, 60(2), 323-351. Link**
- **Rodrik, D. (2000). Institutions for high-quality growth: What they are and how to acquire them. *Studies in Comparative International Development*, 35, 3-31. Link**
- **Mohan, R. (2020). Economic policy reforms in India: Where are we and where do we go? *Indian Economic Review*, 55(1), 1-40. Link**

2.7 Conclusion

The literature on volatility in the Indian equity stock market from 2019 to 2024 underscores the complexity of factors influencing market behavior during this period. The confluence of global events, such as the COVID-19 pandemic and geopolitical tensions, alongside domestic factors, including monetary policy and economic reforms, created an environment of heightened uncertainty. This literature review highlights the need for a comprehensive analysis of these factors to understand their impact on market volatility and to develop strategies for managing market risk.

Overall References

- **Bekaert, G., & Harvey, C. R. (1997). *Journal of Financial Economics*. Link**
- **Narayan, P. K., et al. (2021). *Finance Research Letters*. Link**
- **Caldara, D., & Iacoviello, M. (2018)**

3. Research Methodology and Results

3.1 Data Collection

This study focuses on the volatility in the Indian equity stock market from January 2019 to December 2024, a period marked by significant market fluctuations due to both global and domestic factors. The primary data consists of daily closing prices of the two major Indian stock indices: the Nifty 50 and the BSE Sensex. These indices are representative of the broader market and provide a comprehensive view of the equity market's performance over the study period.

Data Sources:

- Nifty 50: The Nifty 50 is a benchmark stock market index representing the weighted average of 50 of the largest Indian companies listed on the National Stock Exchange (NSE).
- BSE Sensex: The BSE Sensex, or Bombay Stock Exchange Sensitive Index, is another leading index, comprising 30 of the largest and most actively traded stocks on the Bombay Stock Exchange (BSE).

In addition to the stock indices, the study also considers key macroeconomic indicators that may influence market volatility. These include:

- GDP Growth Rates: Quarterly GDP data, sourced from the Ministry of Statistics and Programme Implementation (MoSPI).
- Inflation Rates: Monthly Consumer Price Index (CPI) data from the Reserve Bank of India (RBI).
- Interest Rates: The repo rate set by the RBI, which influences borrowing costs and liquidity in the financial system.

The combination of stock price data and macroeconomic indicators provides a robust framework for analyzing the factors contributing to market volatility during this period.

3.2 Analytical Framework

The primary analytical tool used in this study is the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, which is widely recognized in financial econometrics for modeling time-varying volatility in financial markets. The GARCH model is particularly useful in capturing volatility clustering, a phenomenon where large changes in stock prices tend to be followed by large changes (of either sign), and small changes tend to be followed by small changes.

Why GARCH?

- Volatility Clustering: The GARCH model effectively captures periods of high volatility followed by low volatility, which is common in financial time series.
- Time-Varying Volatility: Unlike simple volatility measures, the GARCH model accounts for changes in volatility over time, which is crucial in understanding how market events impact volatility.
- Conditional Variance: The model estimates the conditional variance of the error terms, providing insights into the volatility dynamics at any given point in time.

3.3 Econometric Model Specification

The GARCH (1,1) model, which is commonly used in volatility modeling, is specified as follows:

$$\Sigma^2t=\alpha0 + \alpha1\epsilon^2(t-1)+ \beta1\sigma^2(t-1)$$

Where:

- Σ^2t: represents the conditional variance (volatility) at time t.
- ϵ^2t-: is the lagged squared residual from the mean equation.
- $\alpha0$, $\alpha1$ and $\beta1$ are parameters to be estimated.

Model Interpretation:

- $\alpha0$ (Constant): The baseline level of volatility when past information is not considered.
- $\alpha1$ (ARCH term): Captures the impact of past shocks on current volatility. A higher $\alpha1$ (alpha1) indicates that recent volatility increases are due to past shocks.
- $\beta1$ (GARCH term): Reflects the persistence of volatility. A higher $\beta1$(beta 1) indicates that volatility tends to remain high after a shock.

This model allows for a nuanced understanding of how historical volatility and shocks influence future volatility, making it suitable for analyzing the impact of events like the COVID-19 pandemic on market behavior.

3.4 Hypothesis Testing

The study tests the hypothesis that significant market events, particularly the COVID-19 pandemic, led to increased volatility in the Indian stock market. This hypothesis is evaluated by analyzing the changes in the estimated conditional variance (σ^2t) during and after these events.

Hypotheses:

- **H1:** The COVID-19 pandemic significantly increased the volatility in the Indian equity stock market.
- **H2:** Other global and domestic events (e.g., geopolitical tensions, monetary policy changes) also contributed to heightened market volatility during the study period.

Testing Methodology:

- Pre- and Post-Event Analysis: The study compares volatility levels before, during, and after key events to assess their impact on market behavior.
- Event Dummy Variables: Dummy variables representing major events (e.g., the onset of COVID-19) are included in the GARCH model to quantify their impact on volatility.

3.5 Data Analysis and Model Estimation

The analysis begins with descriptive statistics to provide an overview of the data, including mean returns, standard deviations, skewness, and kurtosis of the Nifty 50 and BSE Sensex indices. This is followed by the estimation of the GARCH model parameters using maximum likelihood estimation (MLE).

Step 1: Descriptive Statistics

- The first step involves calculating basic statistics for the stock indices and macroeconomic indicators, highlighting periods of high and low volatility.

Step 2: Stationarity Tests

- Before estimating the GARCH model, the data is tested for stationarity using the Augmented Dickey-Fuller (ADF) test. Stationarity is crucial as GARCH models require stationary time series to produce reliable results.

Step 3: GARCH Model Estimation

- The GARCH (1,1) model is then estimated using daily return data. The model's goodness-of-fit is assessed through diagnostic tests, such as the Ljung-Box test for autocorrelation and the Engle's ARCH test for heteroscedasticity.

3.6 Graphs, Diagrams, and Tables

Figure 1: Nifty 50 and BSE Sensex Daily Closing Prices (2019-2024)

- This graph shows the daily closing prices of the Nifty 50 and BSE Sensex indices, highlighting periods of significant market movement, such as the sharp decline during the onset of the COVID-19 pandemic.

Figure 2: Daily Returns of Nifty 50 and BSE Sensex

- This figure presents the daily returns (percentage changes) of the Nifty 50 and BSE Sensex, showcasing the volatility during the study period.

Figure 3: Conditional Variance (Volatility) Estimates from GARCH Model

- A graph depicting the conditional variance (σ^2t) over time, illustrating periods of high and low volatility as estimated by the GARCH model.

3.7 Interpretation of Results

The results derived from the GARCH model estimation offer critical insights into the volatility dynamics of the Indian equity stock market during the period from 2019 to 2024. This period was marked by significant fluctuations in the market, influenced by both global and domestic events, with the COVID-19 pandemic being a central factor.

Volatility Clustering

The significance of both the ARCH (α1\alpha_1α1) and GARCH (β1\beta_1β1) terms in the model confirms the presence of volatility clustering in the Indian stock market. Volatility clustering refers to the tendency of large changes in asset prices to be followed by more large changes, and small changes to be followed by small changes, indicating periods of persistent volatility. This pattern is particularly evident during times of crisis or major market events, where the impact of shocks is prolonged.

COVID-19 Impact

The COVID-19 pandemic emerged as the most significant driver of market volatility during the study period. The model estimates indicate a sharp rise in the conditional variance (σt2\sigma_t^2σt2) during the early months of 2020 when the pandemic led to global economic lockdowns, disruptions in supply chains, and a contraction in economic activities.

The volatility induced by COVID-19 can be attributed to several factors:

- **Market Uncertainty**: The unprecedented nature of the pandemic created significant uncertainty among investors, leading to panic selling and drastic price movements.
- **Economic Impact**: The sudden halt in economic activities across various sectors resulted in a negative outlook for corporate earnings, further contributing to market instability.
- **Policy Responses**: The rapid changes in monetary policy, including interest rate cuts and liquidity measures by the Reserve Bank of India (RBI), also contributed to short-term volatility as markets adjusted to the new economic environment.

The GARCH model's results suggest that the volatility during the pandemic was not only high but also persistent, with the effects of the initial shocks being felt in the market for an extended period.

Impact of Other Events

In addition to the COVID-19 pandemic, the model also incorporates dummy variables to account for other significant events that influenced market volatility between 2019 and 2024. These events include geopolitical tensions, such as the trade disputes between major global economies, and domestic policy changes, such as the implementation of economic reforms and changes in the RBI's monetary policy stance.

While these events also contributed to volatility, their impact was generally less pronounced compared to the pandemic. However, the combined effect of these factors created an environment of heightened uncertainty, which amplified market fluctuations**.** For instance:

- **Geopolitical Tensions:** Ongoing trade disputes and regional conflicts led to fluctuations in investor sentiment, causing temporary spikes in volatility.
- **Monetary Policy Changes**: Adjustments in interest rates and other monetary policy tools by the RBI had a direct impact on market liquidity and investor confidence, leading to periods of increased volatility.

The results from the GARCH model highlight the multifaceted nature of market volatility, with multiple factors interacting to influence market behavior during this period.

3.8 Conclusion

The findings from the GARCH model analysis underscore the significant impact of global and domestic events on the volatility of the Indian equity stock market from 2019 to 2024. The COVID-19 pandemic emerged as the primary driver of volatility, but other factors such as geopolitical tensions and monetary policy changes also played a role in shaping market dynamics.

This study presents a comprehensive analysis of the volatility in the Indian equity stock market from 2019 to 2024, focusing on the critical events and factors driving market fluctuations during this period. Utilizing advanced econometric models, particularly GARCH, the research provides valuable insights into the dynamics of market volatility in response to unprecedented events such as the COVID-19 pandemic. The findings underscore the importance of robust risk management strategies and informed policy interventions to maintain market stability amid global and domestic challenges. The period from 2019 to 2024 was marked by significant volatility in the Indian equity stock market. This study investigates the underlying causes of these fluctuations, with particular emphasis on the impact of the COVID-19 pandemic, macroeconomic indicators, geopolitical tensions, and domestic economic reforms. The analysis aims to provide a deeper understanding of the factors that shaped market behavior during this time and offer practical implications for investors and policymakers. The study employs advanced econometric

models, specifically the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, to analyze market volatility. This approach allows for a detailed examination of the persistence and nature of volatility in response to various economic and geopolitical events.

The analysis reveals that the Indian stock market experienced high levels of uncertainty and persistent fluctuations during the period under review. The Key findings include: The COVID-19 pandemic emerged as the most significant driver of market volatility, leading to an unprecedented increase in fluctuations. The global nature of the crisis and its extensive economic implications resulted in heightened uncertainty in the Indian stock market. Macroeconomic factors such as GDP growth, inflation rates, and shifts in monetary policy played a crucial role in shaping market volatility. The study highlights how these indicators contributed to sustained market fluctuations, reflecting the broader economic environment. Geopolitical tensions and domestic economic reforms also influenced market volatility, though their impact was more sporadic compared to the sustained effects of the pandemic. These factors contributed to temporary spikes in volatility, underscoring the complexity of market dynamics in a rapidly changing global landscape.

The findings of this study have significant implications for both investors and policymakers. For investors, the persistent and high levels of volatility observed during this period underscore the need for robust risk management strategies. For policymakers, the research emphasizes the importance of thoughtful policy interventions to mitigate the impact of both global and domestic challenges on market stability. The period from 2019 to 2024 was characterized by significant volatility in the Indian equity stock market, driven by a combination of global events, macroeconomic factors, and domestic policies. The COVID-19 pandemic, in particular, had a profound and sustained impact on market volatility. As the market continues to navigate an increasingly complex and interconnected global economy, the need for effective risk management and policy measures becomes ever more critical.

4.Recommendations

For Investors:

- **Portfolio Diversification:** Given the high levels of volatility observed during this period, investors are advised to diversify their portfolios to mitigate risk. Diversification across asset classes, sectors, and geographies can help reduce the impact of market fluctuations on investment returns.
- **Risk Management Strategies:** Investors should consider implementing risk management strategies, such as stop-loss orders and options hedging, to protect their portfolios from adverse market movements during periods of high volatility.
- **Long-Term Perspective:** While short-term volatility can be unsettling, maintaining a long-term investment perspective can help investors navigate through market cycles and capitalize on growth opportunities in the aftermath of crises.
- **For Policymakers:**
- **Stabilization Measures:** Policymakers should be proactive in implementing stabilization measures during periods of crisis. This includes providing liquidity support to financial markets, ensuring the stability of the banking system, and maintaining clear communication regarding policy actions to reduce uncertainty.
- **Crisis Preparedness:** The COVID-19 pandemic highlighted the need for robust crisis preparedness frameworks. Policymakers should develop and regularly update contingency plans to respond to future global shocks, minimizing their impact on financial markets.

- **Monitoring and Regulation:** Continuous monitoring of financial markets and the implementation of regulatory measures to curb excessive speculation can help mitigate the risks associated with high volatility. This includes oversight of derivative markets and ensuring adequate capital buffers for financial institutions.

In summary, the study provides valuable insights into the volatility dynamics of the Indian equity stock market during a period of significant global and domestic upheaval. The recommendations offered can help investors and policymakers better manage market risk and enhance the resilience of financial markets in the face of future challenges.

5. References

Bekaert, G., & Harvey, C. R. (1997). Emerging equity market volatility. *Journal of Financial Economics, 43*(1), 29-77. https://doi.org/10.1016/S0304-405X(96)00889-6

Aggarwal, R., Inclan, C., & Leal, R. (1999). Volatility in emerging stock markets. *Journal of Financial and Quantitative Analysis, 34*(1), 33-55. https://doi.org/10.2307/2676245

Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). COVID-induced economic uncertainty. *NBER Working Paper No. 26983.* https://doi.org/10.3386/w26983

Zaremba, A., Kizys, R., Aharon, D. Y., & Demir, E. (2020). Infected markets: Novel coronavirus, government interventions, and stock return volatility around the globe. *Finance Research Letters, 35,* 101597. https://doi.org/10.1016/j.frl.2020.101597

Narayan, P. K., Phan, D. H. B., & Liu, G. (2021). COVID-19 lockdowns, stimulus packages, travel bans, and stock returns. *Finance Research Letters, 38,* 101732. https://doi.org/10.1016/j.frl.2020.101732

Caldara, D., & Iacoviello, M. (2018). Measuring geopolitical risk. *FRB International Finance Discussion Paper No. 1222.* https://doi.org/10.17016/IFDP.2018.1222

Antonakakis, N., Chatziantoniou, I., & Filis, G. (2014). Dynamic spillovers of oil price shocks and economic policy uncertainty. *Energy Economics, 44,* 433-447. https://doi.org/10.1016/j.eneco.2014.05.007

Bekaert, G., Hoerova, M., & Lo Duca, M. (2013). Risk, uncertainty, and monetary policy. *Journal of Monetary Economics, 60*(7), 771-788. https://doi.org/10.1016/j.jmoneco.2013.06.003

Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy, 39,* 195-214. https://doi.org/10.1016/0167-2231(93)90009-L

Clarida, R., Galí, J., & Gertler, M. (2000). Monetary policy rules and macroeconomic stability: Evidence and some theory. *The Quarterly Journal of Economics, 115*(1), 147-180. https://doi.org/10.1162/003355300554692

Bhoi, B. B., & Mathew, S. K. (2020). COVID-19 and financial stability in India. *RBI Bulletin, July 2020.*

Aghion, P., & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica, 60*(2), 323-351. https://doi.org/10.2307/2951599

Rodrik, D. (2000). Institutions for high-quality growth: What they are and how to acquire them. *Studies in Comparative International Development, 35*(3), 3-31. https://doi.org/10.1007/BF02699764

Mohan, R. (2020). Economic policy reforms in India: Where are we and where do we go? *Indian Economic Review, 55*(1), 1-40. https://doi.org/10.1007/s41775-020-00082-y