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Responses of the Indian Stock Market to Financial Crises

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Abstract - This research analyzes the Indian stock market's behavior during periods of financial crises and investigates how these economic downturns affect market performance and investor reactions. Financial crises frequently result in substantial market volatility and uncertainty, presenting challenges for both investors and financial institutions. By examining stock price fluctuations, trading volumes, and the responses of different investor categories—such as retail, institutional, and foreign investors—this study strives to offer a thorough understanding of market dynamics during crises. Additionally, the research delves into the influence of investor risk profiles on their investment choices during financial stress. Insights gained from this study can aid policymakers, investors, and financial advisors in formulating effective strategies for managing risks and making informed investment decisions during times of economic instability. The results enhance the comprehension of how financial crises affect the Indian stock market, providing essential guidance for navigating potential future economic downturns.

I. INTRODUCTION:

1.1 INTRODUCTION:

The Indian stock market, similar to other global markets, has encountered numerous challenges, especially in times of financial crises. Such crises, often instigated by factors like economic recessions, banking failures, or geopolitical issues, can significantly influence investor sentiment and market stability. This report intends to explore the historical responses of the Indian stock market to financial crises. By scrutinizing significant events, market trends, and government interventions, we aim to uncover the elements that have shaped India's resilience while identifying possible vulnerabilities. Through this investigation, we aspire to offer valuable insights for investors, policymakers, and researchers interested in the workings of the Indian stock market and its capacity to endure future economic shocks. Fig 1.1 illustrates the impact of crises on financial markets.

1.2 Industry overview

The Indian stock market, like others globally, has faced fluctuations in response to international financial crises. Historically, these crises have resulted in notable market declines, marked by abrupt drops in stock values, heightened market volatility, and investor anxiety. Nevertheless, the Indian market has exhibited resilience, often recovering and, in the long term, even surpassing global markets. Several factors account for the Indian market's reactions to financial crises. Firstly, the nation's strong economic fundamentals, which include a large domestic market, a burgeoning middle class, and a relatively stable political environment, have provided protection against global shocks. Secondly, the Indian government has enacted numerous measures to alleviate the effects of crises, such as monetary policy adjustments, fiscal stimulus packages, and regulatory reforms. Thirdly, the increasing integration of the Indian economy with the global market has rendered it more vulnerable to external influences, yet it has also presented opportunities for diversification and growth.

1.3 Global scenario

Historically, India's stock market has displayed strong resilience during global financial upheavals. For example, in the 2008 Global Financial Crisis, the Indian market saw a major downturn but recovered more swiftly than many developed countries. This resilience stems from several factors, including a robust domestic economy, a relatively low foreign debt-to-GDP ratio, and government interventions. As we move into 2024, the global economic environment remains precarious, presenting several potential threats that could affect India's stock market. Ongoing geopolitical tensions and trade conflicts may disrupt global supply chains, elevate commodity prices, and dampen investor confidence. Central banks around the globe are currently facing inflationary pressures, leading to interest rate hikes aimed at cooling down their economies. Such actions could result in a slowdown in economic growth, consequently impacting corporate profits. A considerable amount of debt has been accumulated by various nations and corporations. An increase in interest rates, coupled with a global economic decline, could heighten the risk of debt defaults and financial instability.

Should global financial conditions worsen, India's stock market may face enhanced volatility. Investors might become increasingly risk-averse and move their resources into safer assets. A depreciation of the Indian rupee against key currencies could affect the competitiveness of Indian exports while raising import costs. Negative sentiments globally could result in a decline in foreign investment flows into India's stock market. The Indian government's response to these global economic challenges will be critical. Utilizing fiscal and monetary policies can help cushion the impact of external shocks on the domestic economy.

1.4 Indian scenario

The Indian stock market has historically proven to be resilient during global financial crises. This trend persisted in 2024, as the market navigated various obstacles, including geopolitical issues, economic uncertainties, and market fluctuations. India's strong economic growth, paired with a relatively stable banking sector, offered a solid groundwork for the market. The government's proactive initiatives, such as fiscal stimulus and regulatory measures, played a significant role in mitigating the adverse effects of crises on the market. The diverse nature of India's economy, encompassing sectors like technology, agriculture, and manufacturing, provided a level of protection against shocks affecting any single industry. In spite of global uncertainties, investor optimism about India's long-term growth potential remained, resulting in continued investment inflows into the market.

Although the Indian stock market has shown impressive resilience, it is crucial to understand that no market is without its risks. Future financial crises could present substantial challenges, and investors should remain cautious and diversify their portfolios to effectively manage risks.

1.5 Industry Framework

The Indian stock market has shown resilience despite global financial upheavals. While it can be affected by external disturbances, strong underlying factors and government actions have frequently alleviated the effects. With India's varied economy, which includes sectors like agriculture, manufacturing, services, and technology, the impact of crises on particular industries has been buffered. Although the Indian banking sector encounters challenges, it generally upholds stability, ensuring sufficient credit availability for businesses. The government has been

instrumental in offering stimulus packages, implementing regulatory measures, and providing liquidity support during crises. In spite of global uncertainties, India's long-term growth potential has drawn significant foreign investment, enhancing market confidence. Nevertheless, the Indian stock market has its vulnerabilities. Elements such as geopolitical issues, changes in domestic policy, and international economic conditions can affect its performance.

LITERATURE REVIEW

Agus, Fabrizio Rossi., A study from January 2023 investigates how markets reacted to the World Health Organization (WHO) declaring the novel coronavirus disease 2019 (COVID-19) as a global pandemic, focusing on emerging equity markets in comparison with developed markets. This research also contrasts the market reactions to the COVID-19 pandemic with those observed during the 2008 global financial crisis. It concludes that the COVID-19 pandemic exerted a significantly more adverse effect on stock markets in emerging economies than in developed ones, with a more significant negative impact on firms with smaller market capitalizations and on growth-oriented stocks.

Sanjeev Kumar, Jaspreet Kaur. In 2021, this study analyzes the reaction of stock markets during the COVID-19 pandemic across major stock markets in the BRICS countries, comparing it with the 2008 financial crisis utilizing the GARCH and EGARCH models. Initially, it assesses differences in the average and variance of stock returns before and after the pandemic using t-tests and F-tests. Moreover, OLS regression is utilized to examine how COVID-19 affects the standard deviation of returns, incorporating daily data of total cases, total deaths, and index returns from the date of the first reported case until June 2020. Subsequently, GARCH and EGARCH models are used to compare stock market volatility impacts from COVID-19 and the 2008 financial crisis, analyzing respective stock index data from 2005 to 2020. The findings indicate that the rising number of COVID-19 cases and fatalities negatively impacted the stock markets of the five countries, with the exception of South Africa regarding the latter. The results from the GARCH and EGARCH models demonstrate that the 2008 financial crisis led to greater stock volatility in India and Russia, whereas the stock markets of China, Brazil, and South Africa exhibited higher volatility during the COVID-19 pandemic. This study offers practical insights for investors, portfolio managers, institutional investors, regulatory bodies, and policymakers, enhancing their understanding of stock market behavior amid significant global crises and aiding in decision-making regarding associated risks.

Roni Bhowmik, Gouranga Chandra Debnath, Nitai Chandra Debnath, and Shouyang Wang. September 13, 2022 This research examines the Granger causal relationships among six emerging stock markets in Asia and the US market from 2002 to 2020, considering various crisis periods. The pairwise Granger causality tests reveal significant bi-directional and uni-directional causal relationships in these markets, indicating an increasing level of international integration following each crisis. An exception is Bangladesh, which shows minimal significant short-term causal relationships with other markets. To understand how financial connections enhance the effects of volatility spillover, we utilize the GARCH-M model and discover that volatility and return spillovers exhibit an inverse relationship over time. However, market connections are weak prior to crisis periods but become notably strong during financial crises and periods of US-China economic policy uncertainty. The US market emerges as a key player during the financial crisis and COVID-19 periods. Further examination with the VAR model indicates that a significant portion of the forecast variance of Asian emerging stock markets is influenced by the S&P 500, with market shock noticeably increasing from periods one to ten. The overall results could offer important policy insights for the six countries studied concerning hedging, trading strategies, and financial market regulation.

Santanu Pal, Ajay K Garg, and Damir Tokic. April 25, 2019 This study investigates the influence of surprises in monetary and macroeconomic policy on Indian stock market indices. By using event analysis and a VAR model, the research finds that surprises in monetary policy have a significant impact on the stock market, while other macroeconomic variables also contribute. The study emphasizes the effects of industry and size, aligning with the CAPM model. While earlier studies have concentrated on monetary policy surprises within developed markets, this research provides a distinct view on the concurrent impacts of both monetary and macroeconomic surprises in India. The results are pertinent for investors, policymakers, and professionals in corporate finance, as they can aid in shaping hedging strategies, evaluating policy effectiveness, and guiding decision-making.

Saji T.G. This paper conducts an empirical analysis of both short-term and long-term relationships between the Indian stock market and major developed markets worldwide from 2005 to 2013. The aim of this analysis is to determine if the financial recession of 2008 offers enhanced diversification benefits for global investors interested in equity investments in India. The empirical findings from the Granger causality test indicate causality flowing from developed markets to the Indian market in the short term during both pre- and post-crisis periods. However, the Johansen cointegration methodology fails to demonstrate evidence of price integration among markets after the recession, suggesting that the long-term price movements in the Indian stock market are not influenced by factors common to other markets. These results further validate the potential for diversification for global investors through equity investments in India.

Prakash Tiwari and Monika Mehrotra, 2012 The aim of this research paper is to explore the performance and connections of various investor groups, specifically Foreign Institutional Investors, Domestic Institutional Investors, and Individual Investors, utilizing daily net flows in the Indian equity market. We focus on analyzing investor behavior before, during, and after the 2008 financial crisis. The Augmented Dickey-Fuller tests were applied, revealing that all net inflows are stationary at their original level, while market returns become stationary at the first difference. The causal relationships among the different investor groups were examined using the Granger Causality test and VAR across different phases: pre-crisis, during the crisis, and post-crisis periods. The results indicate that the behavior of all groups does not change across all phases of the crisis, except for the performance of the domestic investor group. The Engle–Granger Co-integration test further demonstrated that there is no cointegration among the various investor groups.

III. PROFILE OF THE STUDY

3.1 Topic of the Study

“Reactions of the Indian Stock Market to Financial Crises”

3.2 Purpose of the Study

The primary aim of this study is to assess the Indian stock market during financial crises and how these crises affected market performance. This research investigates market behavior in response to crises, focusing on downturns, sudden fluctuations, movements, and volatility. The findings will assist in analyzing market responses in similar future situations and in making informed decisions during such events.

3.3 Statement of the Problem

Financial markets are extensive and intricate, making it vital to comprehend how financial crises impact market behavior and investor reactions. Predicting future movements in financial markets is challenging, leading to

difficulties in making informed decisions. The study primarily seeks to evaluate the effects of crises on stock markets in various countries, with a focus on India and its stock market. By conducting this research, we aim to gain a deeper insight into financial markets and their behaviors, which will aid in minimizing risks and boosting confidence in financial markets.

3.4 Objectives and Scope

3.4.1 Objectives of the research

- Analyze the Effects of Financial Crises
- Identify Major Factors Influencing Market Response
- Evaluate Sector-Specific Vulnerabilities
- Offer Policy and Investment Recommendations

3.4.2 Scope of the research

The research scope centers on the analysis of the stock market concerning global financial crises. It specifically examines the impact on market performance and volatility while considering other aspects such as sector differences and government interventions. The study provides insights into possible variations in financial markets due to crises, helping equip us for potential future crises.

3.4.2 Research Scope

The scope of this investigation primarily concentrates on examining the stock market in relation to global financial crises. It specifically evaluates the effects on market performance and volatility while also considering factors like sector variations and government interventions. This research provides insights into potential changes in financial markets during crises, equipping us to respond effectively should such crises occur.

3.5 Research Topic Background

The Indian stock market is recognized as the fastest-growing market globally. In recent years, it has experienced notable fluctuations in reaction to global financial emergencies, such as the crisis of 2008 and the COVID-19 pandemic, alongside various other factors contributing to market crashes. These crises highlight both market volatility and economic growth. This investigation will examine market responses and pinpoint the elements that drive behavioral changes during crises, offering guidance on managing future disruptions. In the last few decades, we have observed considerable shifts in the stock markets characterized by irregular fluctuations, which impact investor confidence, leading to hesitation in market investments. Thus, this study seeks to identify the critical factors affecting markets during crises and provide insights for analyzing potential future disruptions.

3.6 Research Methodology

Methodology in a study typically outlines the techniques, processes, and methods used to analyze a specific issue. It comprises two types of data utilized in this research:

1. Primary Data

2. Secondary Data

3.6.1 Primary Data

Primary data refers to firsthand information acquired through direct investigation into the subject. It is gathered via surveys and questionnaires. The collection of primary data can be labor-intensive and costly. Statistical analysis of the gathered data will employ percentage methods, with the results visually represented through graphs.

3.6.2 Secondary Data

Secondary data consists of information collected from previously conducted research, thereby incurring lower costs and being easier to gather. This type of data is sourced from books, journals, websites, reports, newspapers, articles, and e-journals, often derived from surveys, experiments, or research conducted by prior researchers.

3.6.3 Sample Design

In this study, secondary data will be utilized to evaluate the responses of the Indian stock market to different financial crises. The sampling strategy will focus on selecting data from significant historical financial crises, concentrating on stock market indices and specific sector indices within India. This non-probabilistic approach relies on purposive sampling to ensure that the data reflects significant financial occurrences.

3.6.4 Research Population

The focus population for this study includes all trading days of the Indian stock market, represented by key market indices such as:

- BSE Sensex (Bombay Stock Exchange)

- NSE Nifty 50 (National Stock Exchange)

3.6.5 Sampling Frame

The sampling frame consists of historical stock market data surrounding the major Global Financial Crisis of 2008, which had a substantial impact on both global and Indian markets.

3.6.6 Sample Size

The size of the sample will be established based on the availability of stock market data from a period of five months prior to and five months following each crisis for the short term, and five years for the long term. This duration will facilitate the examination of both the immediate impact and the recovery stage of the stock market.

Data Collected as Follows:

Period Start Date End Date Duration

Short-term Pre-crisis April 15, 2008 September 14, 2008 5 months

Short-term Post-crisis September 16, 2008 February 15, 2009 5 months

Long-term Pre-crisis September 15, 2003 September 14, 2008 5 years

Long-term Post-crisis September 16, 2008 September 15, 2013 5 years

3.6.7 Data Sources

The stock market index data will be sourced from:

- Closing prices of NSE India and BSE India obtained from the Yahoo Finance website for historical data.

- Closing prices from the historical data of the DOW JONES Composite Index.

3.6.8 Sampling Period

The research will concentrate on specific crisis periods, generally characterized by:

- The date when the crisis begins (the first notable decline in the market).

- Short term data – Pre-crisis period and Post-crisis (Five months leading up to and following the crisis)

- Long term data – Pre-crisis and post-crisis period (5 years preceding and following the crisis).

3.7 Hypothesis and Data Analysis

This segment will analyze the relationship between the Indian stock markets (BSE Sensex and NSE Nifty 50) and the DOW JONES during the 2008 Global Financial Crisis through hypothesis testing and regression analysis. The evaluation will include both short-term (5 months before and after the crisis) and long-term (5 years before and after the crisis) to determine how closely the Indian markets reflected the performance of the DOW JONES.

3.8 Regression Analysis:

Regression Analysis is a statistical tool used for the estimation of relationship between the Indian stock indices and Dow Jones during the short term and long term period.

- **Short-Term Regression Analysis of NSE Nifty 50 During the 2008 Financial Crisis:**

  Hypothesis 1: Regression between Nifty 50 and DOW JONES

- Null Hypothesis (H_0): There is no significant relationship between the Nifty 50 and the DOW JONES during the short-term pre and post-crisis.
- Alternative Hypothesis (H_1): There is a significant relationship between the Nifty 50 and the DOW JONES during the short term pre- and post-crisis.

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Regression Statistics	
Multiple R	0.957207
R Square	0.916246
Adjusted R Square	0.90694
Standard Error	275.8542
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	7492147.386	7492147	98.4571	3.81731E-06
Residual	9	684859.9703	76095.55		
Total	10	8177007.356			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-879.089	470.9830112	-1.8665	0.094827	-1944.5261	186.349085	-1944.5261	186.3490848
X Variable 1	0.449469	0.045297741	9.922555	3.82E-06	0.346998719	0.55193994	0.34699872	0.551939936

Interpretation:

Regression analysis between the Dow Jones index and the NIFTY between April 2008 and February 2009 shows a high correlation between the two indices, with a Multiple R of 0.9572, indicating a very strong positive link. According to the R Square value of 0.9162, changes in the Dow Jones account for about 91.6% of the fluctuation in the NIFTY, with only 8.4% leaving room for other causes. This suggests that within this time frame, the Dow Jones is a reliable indicator of the NIFTY's performance. A moderate degree of prediction inaccuracy is shown by the model's average deviation of predictions, which is displayed by the Standard inaccuracy of 275.85.

The NIFTY's value when the Dow Jones is zero is indicated by the coefficients' intercept of -879.09, but this number has no practical significance because the Dow Jones did not drop to zero at this time. With an X Variable 1 coefficient of 0.4495, the NIFTY is predicted to rise by roughly 0.4495 points for every point that the Dow Jones rises. Strong proof that the association between the two indices is not the result of chance is provided by this statistically significant coefficient, which has a very low p-value of 3.82E-06. The regression model's high reliability is further supported by the ANOVA table, which shows an F-statistic of 98.46 and a Significance F value of 3.82E-06.

All things considered, the regression analysis demonstrates that the Dow Jones is a very substantial and trustworthy predictor of the NIFTY, accounting for the majority of its fluctuations throughout this time frame. Despite its robustness, the model leaves some fluctuation unexplained, indicating that factors other than the Dow Jones may have an impact on the NIFTY.

- **Short-Term Regression Analysis of BSE Sensex During the 2008 Financial Crisis**

  Hypothesis 2: Regression between Sensex and DOW JONES
- Null Hypothesis (H_0): There is no significant relationship between the Sensex and the DOW JONES during the short-term pre and post-crisis.

- Alternative Hypothesis (H_1): There is a significant relationship between the Sensex and the DOW JONES during the short term pre- and post-crisis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.964349251
R Square	0.929969479
Adjusted R Square	0.92218831
Standard Error	865.7596463
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	89581540.04	89581540	119.5154	1.69592E-06
Residual	9	6745857.887	749539.8		
Total	10	96327397.92			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-3561.31938	1478.165101	-2.40928	0.039295	-6905.161149	-217.47761	-6905.161149	-217.477607
X Variable 1	1.554197357	0.142165509	10.93231	1.7E-06	1.232596634	1.8757981	1.232596634	1.875798081

Interpretation:

Regression analysis between the Dow Jones index and the SENSEX between April 2008 and February 2009 shows a considerable and robust correlation. An extremely strong correlation between the two indexes is indicated by the Multiple R value of 0.9643, which implies that changes in the Dow Jones can account for a sizable amount of the variance in the SENSEX. The R Square value of 0.93 indicates that the Dow Jones's movements account for roughly 93% of the SENSEX's fluctuation, with only 7% coming from other sources. The model has a very high degree of explanatory power.

By taking into consideration the number of variables and showing that the association between the two indices is still strong even after correcting for possible overfitting, the Adjusted R Square of 0.9222 significantly improves the model's explanatory ability. A comparatively small level of inaccuracy in the regression model's predictions is indicated by the Standard inaccuracy of 865.76, which is the average difference between the observed values of the SENSEX and those predicted by the model.

According to the coefficients, the estimated value of the SENSEX when the Dow Jones index is zero is represented by the intercept of -3561.32; however, since the Dow Jones never fell to zero during this time, this value is not practically significant. The SENSEX is predicted to rise by roughly 1.55 points for every 1 point increase in the Dow Jones, according to the coefficient for X Variable 1, which is 1.5542. The extremely low p-value of 1.70E-06 indicates that this link is highly statistically significant, indicating that there is very little probability that it is the result of chance. This coefficient's 95% confidence interval, which spans from 1.2326 to 1.8758, provides more evidence of the two indexes' strong correlation.

With an F-statistic of 119.52 and a Significance F of 1.70E-06, the ANOVA results demonstrate that the model is highly statistically significant, supporting the notion that the regression model fits the data well and that the Dow Jones is a highly relevant predictor of the SENSEX. The Dow Jones index, which explains almost 93% of the SENSEX's movements during this time, is a strong predictor of the index, according to the regression study. The reliability and statistical significance of the link indicate that the two indices typically move in tandem, with the Dow Jones significantly influencing the SENSEX's performance.

- **Long-Term Regression Analysis of NSE Nifty 50: A Five-Year Perspective Pre- and Post-Crisis**

Hypothesis 3: Regression between Nifty 50 and DOW JONES (Long-term).

- Null Hypothesis (H_0): There is no significant relationship between the Nifty 50 and the DOW JONES during the long -term pre and post-crisis.
- Alternative Hypothesis (H_1): There is a significant relationship between the Nifty 50 and the DOW JONES during the long term pre- and post-crisis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.59581955
R Square	0.35500094
Adjusted R Square	0.34953484
Standard Error	1173.53599
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	89442771.91	89442771.9	64.946	7.0405E-13
Residual	118	162508033.1	1377186.72		
Total	119	251950805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1726.4471	736.8591768	-2.3429811	0.020805	-3185.6289	-267.26535	-3185.62891	-267.2653492
X Variable 1	0.51133434	0.06344958	8.05890826	7.04E-13	0.3856869	0.6369818	0.385686899	0.636981783

Interpretation:

The information includes the monthly closing prices for the Dow Jones Industrial Average (U.S. stock market) and the Nifty Index (Indian stock market) from October 2003 to September 2013, as well as the findings of a regression study conducted to determine how the two relate to one another. With a Multiple R value of 0.5958, the correlation between the Nifty and the Dow Jones is moderate, suggesting a favourable but not perfect relationship between the two indices. According to the R Square value of 0.355, the change in Dow Jones prices accounts for about 35.5% of the fluctuation in Nifty prices, with other factors influencing the remaining 64.5%. With a high F-statistic of 64.95 and a very low Significance F value, the regression model itself is statistically significant, indicating that the link between the two indices is not the result of chance. With a coefficient of 0.5113 for the Dow Jones (X Variable 1), the Nifty is predicted to rise by roughly 0.5113 points for every point that the Dow Jones increases. Even while the two indices typically move in the same direction, there are other factors that affect the Nifty, thus the link is not perfect. The lower R Square value, which shows that factors other than the success of the US stock market also affect the Nifty, lends further credence to this. The information also demonstrates that both indices saw notable swings during the 2008 financial crisis but have since mostly continued their upward trajectory, with the Dow Jones and Nifty both rebounding and rising until 2013. Overall, the data points to a moderate correlation between the Nifty and Dow Jones; nevertheless, while evaluating the Nifty's performance, investors should take into account aspects other than the U.S. market.

- **Long-Term Regression Analysis of BSE Sensex: A Five-Year Perspective Pre- and Post-Crisis**
  Hypothesis 4: Regression between Sensex and DOW JONES (Long-term)
- Null Hypothesis (H_0): There is no significant relationship between the Sensex and the DOW JONES during the long -term pre and post-crisis.
- Alternative Hypothesis (H_1): There is a significant relationship between the Sensex and the DOW JONES during the long term pre- and post-crisis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.600834157
R Square	0.361001685
Adjusted R Square	0.355586445
Standard Error	3955.845338
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1043206129	1.04E+09	66.66402	4.02363E-13
Residual	118	1846548056	15648712		
Total	119	2889754185			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*pper 95.0%*
Intercept	-6251.32655	2483.861563	-2.51678	0.013186	-11170.04867	-1332.6044	-11170.049	-1332.6
X Variable 1	1.746294158	0.213880721	8.164804	4.02E-13	1.322752101	2.1698362	1.3227521	2.169836

Interpretation:

From October 2003 to September 2013, the data shown displays the monthly closing prices of the Dow Jones Industrial Average (U.S. stock market index) and the SENSEX (Indian stock market index). To investigate the connection between the two indexes, a regression analysis was performed. With a Multiple R of 0.6008, the results show a moderately positive correlation, indicating that movements in the Dow Jones are somewhat correlated with changes in the SENSEX. With a R Square value of 0.3610, changes in the Dow Jones account for about 36.1% of the volatility in the SENSEX, with other factors influencing the remaining 63.9%.The F-statistic of 66.6640 and the extremely low Significance F of 4.02E-13 demonstrate that this link is statistically significant. According to the regression coefficients, the SENSEX should rise by roughly 1.7463 points for every point that the Dow Jones rises. Even if the relationship is minimal, it is evident that the SENSEX is also impacted by other national and international issues. Both indices saw notable drops during the 2008 financial crisis, but they have largely maintained an upward trend in the years since. This implies that a wider range of market and economic factors drive the SENSEX, even though the US market has an impact. As a result, even though the regression indicates a strong link, investors should take into account other factors while evaluating the SENSEX than the performance of the US market.

IV. FINDINGS AND RECOMMENDATIONS

4.1 Findings

-Strong Short-Term Correlation:

The regression analysis conducted on the Indian stock indices (BSE Sensex and NSE Nifty 50) and the DOW JONES during the 2008 Financial Crisis reveals a robust and statistically significant correlation in both the short-term (five months before and after the crisis). The R^2 values for both indices are notably high (92.99% for Sensex and 91.62% for Nifty 50), signifying that a substantial portion of the variability in the Indian stock indices can be attributed to fluctuations in the DOW JONES. This indicates that, during the crisis, the Indian markets closely tracked the performance of the U.S. market.

Moderate Long-Term Correlation:

In the long-term analysis (five years prior to and following the crisis), the correlation between the Indian stock indices and the DOW JONES is reduced (R^2 values of 36.10% for Sensex and 35.50% for Nifty 50). Although the relationship remains statistically significant (with p-values approximately equal to zero), it is not as strong as the short-term correlation. This indicates that while the global financial crisis had a prolonged impact on the Indian markets, local factors played a more dominant role in influencing long-term market performance.

Statistical Significance:

Both the short-term and long-term analyses indicate very low p-values, affirming that the regression relationships between the Indian indices and the DOW JONES are statistically significant.

DOW JONES Coefficient:

The coefficients reveal that for every 1-point increase in the DOW JONES, the Sensex rises by 1.5542 points in the short term and 1.7463 points in the long term. In contrast, for the Nifty 50, a 1-point increase in the DOW JONES leads to a 0.4494 point rise in the short term and 0.5113 points in the long term. This illustrates that the BSE Sensex is more responsive to changes in the DOW JONES compared to the Nifty 50, particularly in the short term.

SUMMARY OUTPUT

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Total	119	251950805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1726.447	736.85918	-2.343	0.0208	-3185.63	-267.265	-3185.629	-267.2653
X Variable 1	0.511334	0.0634496	8.05891	7E-13	0.385687	0.636982	0.3856869	0.6369818

4.2 Suggestions

Incorporate Additional Factors:

While the regression analysis sheds light on the connection between the Indian stock markets and the DOW JONES, it is essential to factor in other elements (such as domestic economic indicators, political occurrences, or sector-specific information) that could influence the Indian markets, especially in the long term. Including these variables in a multi-factor model could enhance the explanatory power and provide more thorough insights.

Broaden the Analysis:

Consider broadening the analysis to encompass other global crises, like the 2020 COVID-19 pandemic, to assess how the relationship between Indian markets and global indices changes during various types of financial crises.

Investor Strategy Insights:

The findings indicate that Indian markets tend to reflect global trends during periods of crisis; however, the strength of the correlation weakens in the long run. Investors aspiring to comprehend how the Indian stock market may respond to future global crises should pay close attention to short-term global market movements while also taking local economic factors into account for long-term investment decisions.

Risk Management:

Given the significant connection between the DOW JONES and Indian stock indices, it is vital for investors and policymakers to closely observe global market developments, especially during times of financial instability, to anticipate potential repercussions on the Indian stock market.

4.3 Conclusion

• The assessment indicates a notable short-term correlation between the Indian stock markets (Sensex and Nifty 50) and the DOW JONES during the 2008 Global Financial Crisis, suggesting that the Indian market closely reflected global trends right after the crisis. The strong short-term relationship points to the significant and direct impact that global factors, such as movements in the U.S. market, can exert on Indian markets during times of crisis.

• However, over the long run, this correlation diminishes, showing that local factors, including domestic economic policies, company performance, and investor sentiment, play a more substantial role in shaping the Indian markets over time. Although the statistical significance between the Indian indices and the DOW JONES persists, the explanatory strength decreases significantly in the long term.

• This research emphasizes the need to take into account both global and local factors when analyzing stock market behavior, particularly during and following a financial crisis. For investors, this implies that while global market trends can provide useful insights in the short term, long-term market performance is more heavily influenced by domestic factors.

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