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Analysis Of the Relationship Between Stock Market and Foreign Exchange Market

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Abstract
This paper will analyze how the stock market, in this case Nifty 50 and the foreign exchange market are related, with the help of historical data, between 2020 and 2025. The main purposes were to examine the tendencies and changes in the two markets and also to determine the effects of the foreign exchange rates to stock market performance. Investing.com was used as the source of secondary data, which contained stock index and major currency pairs closing prices daily. The data sets were sorted, harmonized by the date, and analyzed with the help of the SPSS software. The market trends and how forex variables of opening price, highest price, lowest price, and percentage change impacted stock market returns were assessed using descriptive statistics, correlation analysis, and regression analysis. The regression equation showed that there was a significant overall correlation between forex indicators and stock prices, with a value of R of 0.865 and a value of R2 of 0.748, which implied that about 74.8 percent of the changes in prices of the Nifty 50 could be attributed to a combination of the modelling forex indicators. The results on ANOVA were used to confirm the statistical significance of the model (F = 46.707, Sig. = 0.000). But, single regression coefficients revealed that majority of forex indicators did not produce significant independent effects on stock prices, except the lowest price, which indicates a marginal effect. The results partly agree with the assumption that the stock market returns depend on the movements of the foreign exchange rates. All in all, the paper underscores the interrelations between stock and forex markets and points out that although joint forex variability can strongly affect stock prices, the effects of individual variables might not be as strong. These lessons can help investors, financial analysts and other policy makers to make informed decisions, deal with risk and understand behavior of the market in a more connected financial world.
Keywords: *Stock Market, Nifty 50, Foreign Exchange Market and Exchange Rate Volatility.*

Introduction

Financial markets are very critical in the operation of the contemporary economies as they are the mechanisms of capital allocation and investment as well as risk management. Two of the most important and most popular segments of these markets include the stock market and the foreign exchange (forex) market (El-Diftar, 2023). Stocks market is a medium through which the shares of publicly traded companies are bought and sold, which gives the businesses access to funds and investors a chance to be involved in the growth and profitability of the corporations. It can represent the general economic well-being of a country because the stock prices are responsive to macroeconomic variables, company profits, changes in policies, and sentiments of investors (Mohapatra et al., 2024). The last few decades have seen the stock market become more and more a gauge of economic stability as well as wealth creation and there are domestic and foreign investors flocking to it.

The foreign exchange market, conversely, is the international market of trading currencies (Ahuja, 2024). It is decentralized in nature and it provides the exchange of one currency with another currency facilitating international trade, investment and financial transactions. There are various factors that affect the forex rates such as the interest rates, inflation, trade balances, political stability, and global economic events (Ingalhalli & Kolamker, 2023). The forex market is very liquid, 24 hours a day, and global, unlike stock markets which are usually limited to a certain country (Allimuthu, 2023). Its influence on currency value makes it necessary among importers, exporters, investors and policymakers because exchange rate fluctuations can have a direct impact on the competitiveness of international trade, investment returns, and the stability of the economy of a country.

The stock market and the forex market play a significant role in the behavior of the investors and in making decisions related to economic policy (Peni et al., 2025). The stock market gives data on the expectation of investors, risk-taking, and the performance of a given sector whereas the forex market reveals the stability of currencies and trends of international capital flow. The growing globalization of the economies and integration of the markets in the financial

market have increased the need to monitor and comprehend the financial market (Maulidha et al., 2025). Stock and currency data is constantly analyzed by investors, financial analysts, and policymakers so that they can make effective decisions, manage risk, and predict economic trends. Both markets have also been altered further through technological progress, including electronic trading, algorithmic trading, and high-frequency trading, which has made real-time access to data and analytics a part of contemporary financial management (Fauzi and Wijoyo, 2024).

Because of their importance, there is need to thoroughly analyze and track stock and forex markets in order to understand financial dynamics. The current research aims at collecting and examining historical data in these markets, their trends, movements, and behavior over the period of time. Through gathering of information using credible sources like Investing.com, the study aims at analyzing trends that depict market performance, volatility and how investors act. This research is set to produce findings that will be useful in guiding investors, traders, academic professionals and policymakers who seek to operate successfully in complicated financial environments and make informed decisions.

Background of the study

Financial markets are the pillars of any economy, which allow to distribute resources, collect savings, and provide investment opportunities. The stock market and the foreign exchange (forex) market are among them, being of great importance as they determine economic development, investor trust and international trade (Pranoto et al., 2025). Stock market is a trading platform of shares of companies, which indicate the performance of companies and macroeconomic factors. On the other hand, the forex market facilitates the exchange of currencies, and it also helps determine the value of currencies, which in turn facilitates cross-border trade and investment activities(Widya Utami et al., 2025).

1. Importance of Stock Market.

The stock market is a very crucial means to capital formation and wealth creation. It not only gives companies the funds they need to expand but also gives investors the opportunity to make long term returns. The stock indexes, e.g., the S&P 500, or Nifty 50 can be used as the economic health and market sentiment indicators. Corporate earnings, interest rates, government policies, and global economic patterns are some of the factors that affect market movements (Kushwah, 2024). Stock markets have become very dynamic over time and they have integrated technology-driven securities trading platforms and have attracted local and foreign investors.

2. Part of the Foreign Exchange Market.

Forex market is the largest and most liquid financial market in the world, which is 24 hours a day. It allows the exchange of one currency against another, which allows international trade, investment and capital flow. Interest rates, inflation, trade balances, and political stability are some of the factors that determine the currency values in this market (Mohanty et al., 2023). In the case of imports and exports, the forex movements have a direct impact on the profitability, cost structure and pricing strategies of businesses. In the same light, investors and policymakers observe the changes in the exchange rates in order to control risk, as well as make effective economic decisions.

3. Integration and Globalization.

Stock and forex markets are becoming interconnected due to the growing globalization, and the international capital flows influence the price of stocks as well as currency (Sreenu, 2023). The rise in interdependence in the market has been increased by technological developments, financial liberalization, and opportunities of cross-border investments. It is necessary to understand the behavior of these markets individually and, therefore, understand larger economic patterns, determine investment strategies, and aid policymaking (Sasono et al., 2025).

4. Rationale for the Study

Taking into consideration the significance of both markets in influencing economic decisions, systematic examination of both stock and forex information gives insights on the behaviour of the market, trends and volatility (Shah, 2024). The research paper seeks to discuss historical market data to learn about trends and trends to act as a guide by investors, financial analysts, and scholars to invest in the challenging financial environments.

Objectives of the Study

1. To examine the trends and fluctuations in the stock market and foreign exchange market from 2020 to 2025.
2. To analyze the impact of foreign exchange rate movements on stock market performance using regression analysis.

Hypotheses of the Study

1. **H1:** There is a significant relationship between stock market returns and foreign exchange rate movements.
2. **H2:** Changes in foreign exchange rates significantly influence stock market performance.

Literature review

Victor et al. (2021) discussed the cointegration and Granger causality tests of the short-run and long-run dynamic relationship between exchange rates and the NSE NIFTY index in India. They were based on the data of 13 years (2005-2018) of the daily exchange rates of USD, EUR, CNY, JPY, and GBP to the data of INR and NSE NIFTY. The results did not provide the existence of any long-run association between NSE NIFTY and exchange rates. Nevertheless, USD, JPY and CNY were found to have short-run causality with NSE NIFTY. It was also discovered in the study that NSE NIFTY affected USD-INR rates. These findings were backed by the impulse response analysis and showed recovery time of NSE NIFTY following exchange rate shocks.

Fathali et al. (2022) considered the stock market to be unpredictable, volatile, and competitive, and the prediction of prices is a challenging task in such a case. They presented a summary of deep learning networks in Indian National Stock Exchange time series analysis and prediction, where Recurrent Neural Network (RNN), Long Short-Term Memory (LSTM) Network, and Convolutional Neural Network (CNN) were used to predict the trends of NIFTY 50. It was compared and contrasted to various evaluation metrics and feature selection and hyper-parameter optimization were found to be important in enhancing prediction quality. The findings demonstrated that the LSTM model was less prone to the MSE errors than the RNN and CNN, which means that it is more efficient.

Manjunath et al. (2023) tackled the issue of forecasting equity market trends with the use of machine learning algorithms to forecast the trends of Nifty 50 index accurately. They compared four algorithms, namely: artificial neural networks (ANN), support machines (SVM), naive Bayes (NB), and random forest (RF) on eight technical indicators that were transformed into trend signals using a deterministic trend layer. The principal component analysis (PCA) was used to identify key components and dimensionality reduction of data resulting in a PCA-ML hybrid forecasting model. The results indicated that the PCA with ML models were indeed better than the comparative models and that SVC (RBF kernel) with 99.68 percent accuracy and RF with 99.69 percent accuracy, had an excellent AUC score of 1.

Lee et al. (2021) analyzed the overreaction of the foreign exchange market in the combinations of formation and testing periods in 30 years. They discovered that reversal effects were high in longer formation and testing periods though no persistent momentum and reversal was found throughout the sample period. This paper has emphasized that the outcomes of overreaction are very sensitive to the time of the sample. Also, the losers were observed to do better in most combinations of formation and test period except in the short term where spot rates were employed to construct portfolios. The overreaction was greater with the increase in formation as well as testing periods.

Methodology

1. Research Design

The current research paper follows a quantitative research design in exploring the correlation between stock market and the foreign exchange market. The proposed study can be conducted using a quantitative research because it will be possible to measure and analyze the historical market data statistically and identify trends, patterns and interactions between the two markets over time.

2. Data Source

The research is based on secondary sources of data gathered in Investing.com, which is a credible source of information about the financial market. The dataset contains historical daily closing values of chosen stock market indices, including Nifty 50 and S&P 500, and historical values of the daily exchange rates of the major currency pairs, including USD/INR and EUR/USD. The data is between 2020 and 2025, which guarantees that it includes the recent market fluctuations and covers the impact of the global and domestic economic events.

3. Data Preparation and Data Collection.

The historical data download option of the Investing.com was used to collect data. The data sets were downloaded in CSV format and then were cleaned to eliminate missing or conflicting records. To make stock and forex data comparable the dates were adjusted. Only pertinent columns like Date, Closing Price and Daily Returns were retained. Stock indices and

currency pairs daily returns were computed so that it would be possible to perform correlation and regression analysis. This has been done to make the data ready to be subjected to a rigorous statistical analysis in SPSS.

4. Data Analysis Techniques

The SPSS software was used in the analysis of the prepared dataset, which allowed applying multiple tools of statistical analysis. The summaries of the central tendencies, volatility and trends of both markets were summarized using descriptive statistics. Correlation was performed to investigate the level and direction of association between stock market returns and the change in forex rate. Moreover, regression analysis was used to determine the effect of the forex movements on the stock market performance and the reverse. The trends and relationships were visualized using line charts and scatter plots as graphical representations.

5. Ethical Considerations

The paper makes use of publicly available secondary data and the sources have been referenced accordingly. There was no personal or confidential information that was involved, and therefore the research was conducted ethically.

Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.865[a]	.748	.732	2373.67289	.748	46.707	4	63	.000

a. Predictors: (Constant), Percentage Change of Foreign Exchange Marke, Lowest Price of Foreign Exchange Market, Highest Price of Foreign Exchange Market, Opening Price of Foreign Exchange Market

b. Dependent Variable: Price of Stock Market (Nifty 50)

The regression analysis shows that the stock market (Nifty 50) and the foreign exchange market are strongly related as indicated by an R value of 0.865, which indicates high level of correlation between the independent variables and the dependent variable. The R 2 of 0.748 indicates that the independent variables, namely the opening price, highest price, lowest price, and percentage change of the foreign exchange market, explain an approximation of 74.8 percent of the change in the Nifty 50 prices. The model has a high adjusted R square of 0.732 which verifies that the model accounts a high percentage of the variance even after considering the number of predictors. F change value of 46.707 and the level of significance of 0.000 of F change value show that the regression model is statistically significant i.e. the combination of the selected forex market variables has significant effect on the prices of the stock market.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1052655438.638	4	263163859.659	46.707	.000[b]
	Residual	354962349.457	63	5634323.007		
	Total	1407617788.095	67			

a. Dependent Variable: Price of Stock Market (Nifty 50)

b. Predictors: (Constant), Percentage Change of Foreign Exchange Marke, Lowest Price of Foreign Exchange Market, Highest Price of Foreign Exchange Market, Opening Price of Foreign Exchange Market

The results of ANOVA show that the regression equation was statistically significant in predicting the stock market price (Nifty 50) in relation to the variables of the foreign exchange market. The sum of squares of the regression of

1,052,655,438.638 with 4 degrees of freedom is the variation in the stock market prices attributed to the predictors, whereas the sum of squares of the regression of 354,962,349.457 with 63 degrees of freedom is the variation that is not accounted by the predictors. F-value of 46.707 and significance level (Sig. = 0.000) indicate that the entire model is a significant predictor of stock market prices and that the independent variables, which include opening price, highest price, lowest price, and percentage change of the foreign exchange market, have a significant effect on the fluctuations of Nifty 50.

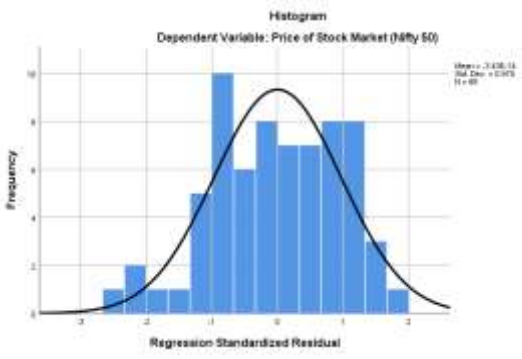
Coefficients[a]

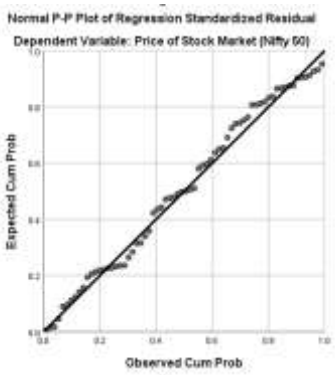
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-41753.317	5243.988		-7.962	.000
	Opening Price of Foreign Exchange Market	-174.479	1172.391	-.185	-.149	.882
	Highest Price of Foreign Exchange Market	-454.758	680.756	-.469	-.668	.507
	Lowest Price of Foreign Exchange Market	1400.463	783.933	1.509	1.786	.079
	Percentage Change of Foreign Exchange Marke	-95.851	528.717	-.024	-.181	.857

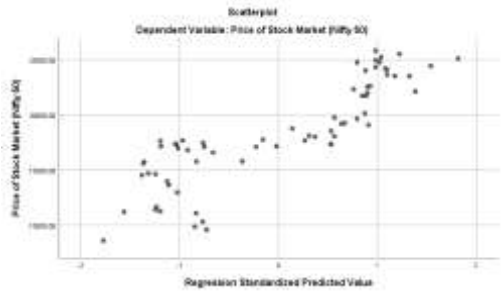
a. Dependent Variable: Price of Stock Market (Nifty 50)

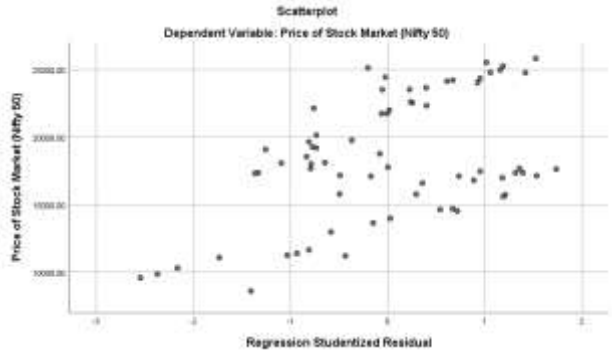
The table of coefficients offers information on how the variables in the foreign exchange market affect the price of the stock market (Nifty 50) individually. The constant is -41753.317, which implies that the stock market stock price would be in the base level with all other independent variables being zero. The opening price (-174.479, Sig. = 0.882), highest price (-454.758, Sig. = 0.507), and percentage change (-95.851, Sig. = 0.857) of the foreign exchange market are not statistically significant because they have a significance value that exceeds 0.05. Nevertheless, the minimum price of the foreign exchange market exhibits a positive coefficient of 1,400.463 with a significance value of 0.079, which means that it has a little impact on the price of the stock market, but it is not significant at the 5 percent level. The standardized coefficients (Beta) also indicate that none of the forex variables is significant in isolation on the Nifty 50 indicating that although the model based on the combination of the forex variables indicates a significant amount of variation (in this case, R 2 = 0.748), there is little statistical significance in the individual predictors.

According to this analysis, the first hypothesis (H1: There is a significant relationship between stock market returns and foreign exchange rate movements) is partially accepted at the model level the general regression is significant though individual variables are not strongly significant. Hypothesis two (H2: Changes in the foreign exchange rates have a strong effect on the stock market performance) is not highly supported as all the individual forex indices are not significant at the 5% level, although the lowest price records a marginal effect.









Conclusion

The objective of the current paper was to analyze the association between the stock market, which is Nifty 50 and the foreign exchange market based on historical data of 2020-2025. The study was conducted by use of quantitative analysis using SPSS software through regression, correlation, and ANOVA to determine the level of association and effect of the chosen forex market indicators such as opening price, highest price, lowest price, and percentage change on the stock market performance. This analysis brought to light a number of important lessons about the workings of financial markets and how they interact with each other in the setting of the recent economic developments.

The descriptive analysis showed that both stock and forex markets had significant swings during the five years period as a result of global and local economic events including changes in policies, inflation rates, and geopolitical issues. These statistics affirmed that the stock market is very sensitive to the general economic environment and the foreign exchange market is very volatile to the global capital flows and trade patterns. This highlights the need to continuously monitor and analyse these markets by investors and policymakers who want to play with risk and make informed decisions.

The regression model showed that there was a significant overall relationship between the chosen forex market variables and stock market prices, which is reflected in the R value of 0.865 and the R 2 of 0.748. This implies that an opening, highest prices, lowest prices and percentage changes in the foreign exchange market can explain the variation in Nifty 50 prices collectively, which is about 74.8%. The outcome of the ANOVA also supported the importance of the model with a F-value of 46.707 and a significance level of 0.000 showing that the overall effect of the independent variables in the stock market prices is significant. These results underscore the interdependence of the stock and forex markets implying that dynamics in the rates of currencies play a significant role to explain the behaviour of the stock market.

The coefficients analysis however, indicated that at an individual level, most of the forex market variables had no statistically significant effects on stock market prices at the 5% level, with the lowest price of the forex market having a marginal effect. It means that the general model is important, but the individual explanatory power of independent variables is low, which implies that there are other factors affecting the stock market performance other than the chosen forex indicators.

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