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The Influence of Currency Fluctuations on NSE Market Capitalization: An Econometric Analysis

Suraj Prakash Singh[1], Ragi T S[2]

[1]Assistant Professor, School of Management Sciences Varanasi, Uttar Pradesh, India

[2]Assistant Professor, School of Management Sciences Varanasi, Uttar Pradesh, India

Abstract

Purpose: This study looks at how currency fluctuations affect the NSE's market capitalization. This study examines historical data from 2013 to 2023 to identify trends, underlying causes, and potential implications for investors and policymakers. The study employs econometric modeling techniques to investigate the relationship between currency exchange rate fluctuations and stock market capitalization.

Design/methodology/approach: To assess the impact of currency fluctuations on the NSE market capitalization, a quantitative research methodology was used, which included regression analysis. The study used secondary data sources such as official financial statements, exchange rate repositories, and stock market indices. The data were statistically analyzed using econometric models, ensuring robust and reliable results. The selection of principal explanatory variables was guided by literature and empirical research, ensuring a thorough assessment of currency exchange rate effects.

Findings: The analysis revealed that exchange rate fluctuations had a significant impact on the NSE's market capitalization. There was a strong correlation between the movement of the INR against primary global currencies and changes in the NSE's overall market valuation. The findings show that instances of INR depreciation are frequently associated with increased market volatility and fluctuations in investor sentiment. The study also emphasizes how macroeconomic variables such as inflation, interest rates, and foreign direct investment (FDI) influence the relationship between exchange rate fluctuations and stock market capitalization.

Practical Implications: The study provides valuable insights for investors, policymakers, and financial analysts into the impact of currency fluctuations on stock market trends. The findings emphasize the importance of exchange rate risk management strategies for investors seeking to minimize potential losses. Policymakers may use the findings to develop regulatory frameworks that promote market stability and foreign investment.

Originality/value: This study adds to the current knowledge base by conducting an empirical analysis of the effects of currency exchange rate fluctuations on NSE market capitalization. In contrast to previous studies, which primarily focus on short-term fluctuations, this study takes a decade-long perspective. The findings improve understanding of market dynamics, allowing stakeholders to make informed investment and policy decisions.

Keywords: Currency exchange rates, market capitalization, National Stock Exchange (NSE), Indian rupee (INR), regression analysis, financial markets, and economic stability.

Introduction

Financial market operations in an economy are visibly affected by changing exchange rates between different currencies. The Indian National Stock Exchange (NSE) experiences substantial market sensitivity to such currency rate movements because of its position as a major worldwide trading platform. Market capitalization of the NSE receives focused investigation from this study regarding how movements of the Indian Rupee (INR) and other major global currencies, such as USD, affect the exchange. Currency fluctuations, which describe the changing values between two currencies, operate as a key controlling element of the worldwide financial system. Various factors, such as interest rate

(Corresponding Author: Suraj Prakash Singh, Assistant Professor, School of Management Sciences Varanasi, Uttar Pradesh, India, E-mail: spsingh1621@gmail.com

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differentials, inflation, political stability, and international economic events, influence the oscillations *(Adrangi,2008)*. The ramifications of these currency fluctuations reach beyond the foreign exchange markets, affecting the broader economic landscape, especially the stock markets. The contemporary global landscape is characterized by a high degree of interconnectivity, allowing capital to move rapidly across national boundaries.

The National Stock Exchange (NSE) of India holds the position as one of the world's biggest and most energetic stock markets which influences other worldwide exchanges. The market capitalization of the National Stock Exchange (NSE) reveals the stock market health state and investor economic confidence through its measurement. All listed companies on the exchange have their worth recorded in this metric. The market capitalization remains sensitive to currency value changes that involve the Indian Rupee (INR) exchange rate compared to the dominant U.S. dollar *(Maharaja & Saravanakumar, 2014)*.

The National Stock Exchange(NSE) market capitalization stands as a fundamental indicator for examining stock market health since it measures investor sentiment toward the national economic conditions. The exchange contains all listed companies whose values comprise this total amount *(Agarwal, 2018; Singh, 2020)*. The market capitalization remains exposed to currency value changes where major fluctuations occur between the Indian Rupee and dominant currencies like the US dollar *(Patel and Joshi, 2019)*. This research investigates the essential future inquiries about discovered research gaps to understand better how changes in currency exchange rates affect stock market performance *(Kumar, 2021)*.

What are the potential implications of fluctuations in the INR/USD exchange rate on the market capitalization of the NSE? Can we elucidate the mechanics underlying these fluctuations and their impact on the diverse sectors that constitute the NSE? How do macroeconomic factors and currency fluctuations impact a company's market value in the current economic landscape? This study seeks to enhance the comprehension of the interplay between fluctuations in exchange rates and the performance of the stock market within the context of a rapidly developing nation such as India, by addressing the pertinent issues identified. This study is important for scholarly advancement and real-world applications, offering essential insights for investors, policymakers, and business strategists. Analyzing these relationships will facilitate the anticipation of market responses to currency fluctuations, enhance the quality of investment decisions, and inform the development of regulations to mitigate the negative impacts of currency volatility on the stock market *(Keshari et al., 2022)*. The market capitalization of the National Stock Exchange (NSE) reveals the stock market health state and investor economic confidence through its measurement. All companies listed on the exchange have their worth recorded in this metric. The market capitalization remains sensitive to currency value changes that involve the Indian Rupee (INR) exchange rate compared to the dominant U.S. dollar.

Review of Literature

Numerous scholarly investigations from *Aggarwal et al. (2019)* among others form the foundation of financial documentation that studies stock market fluctuations in relation to currency movements. Stock markets undergo substantial changes when exchange rates shift significantly particularly in markets where foreign investors maintain considerable investment positions according to *Aggarwal et al. (2019)*. Multiple scientific inquiries including their work form the basis of our understanding about how exchange rate movements influence stock markets. NSE of India operates as one of the largest global stock markets

which affects other stock exchanges throughout the world. Those in favor argue that market depreciation reduces the attractiveness of foreign investments in local assets appealing resulting in stock market price appreciation *(Gautam & Srivastava, 2017)*

The complex stock market relationship goes through influence from both economic performance and market sentiment but also withstands other external components. Using the GARCH (Generalized Autoregressive Conditional Heteroskedasticity) financial model *Seifert (1992)* assessed daily stock market price changes of U.S., British, German, and Japanese markets. The GARCH model reveals how changes in stock market volatility relate to modifications in exchange rates. Analyzing the data revealed strong evidence that changes in stock market performance determined the amount of exchange rate fluctuations. The results show traders need to consider the intricate way stock market achievements affect exchange rate reliability since this understanding helps identify wide-ranging effects triggered by currency movements. *Kanas (2020)* investigated how currency volatility produces uneven effects on stock markets in their research. This term signifies stock market sectors respond uniquely to currency fluctuations while they affect different industries differently. Data shows that when a nation relies heavily on exports depreciation of its currency leads to stock market value increases. The current situation presents a substantial danger to industries that depend heavily on imported products because the increased prices of imported materials could harm their business operations *(Yadav & Chakraborty, 2022).*

The Impact of Currency Fluctuations on Market Capitalization in Emerging Economies

The economic stability of India demonstrates heightened vulnerability because it depends heavily on investments from abroad and international trades. The NSE market capitalization rises when the value of the Indian rupee decreases against the US dollar according to *Singh and Bhatia (2021).* The primary rationale is that international investors perceive a depreciating currency as a chance to acquire undervalued assets, resulting in heightened capital inflows. However, the research indicates that prolonged depreciation could lead to increased inflation and a decline in investor confidence, thereby counteracting the initial enhancement in market value.

Benassy and Revil (2001) investigated the influence of exchange rates on establishing resilient monetary systems within emerging economies. The significance of exchange rate policies in drawing foreign direct investment and mitigating economic shocks was highlighted. The study highlights the critical role of sustaining a stable currency rate in fostering investor confidence and enhancing market capitalization, especially within emerging economies.

Kumar (2022) studied the effects currency rates have on diverse industrial sectors operational within the NSE. The examined sectors which rely heavily on exports namely pharmaceuticals and information technology benefit when the Indian rupee weakens. The realization of revenue earned in foreign exchange at INR results in higher profits which establishes substantial economic value. *Mishra, B. and Rahman (2009)* discussed the process of converting profits earned in foreign currency into Indian Rupees The transition to higher operative levels characterizes business performance. Companies which conduct substantial import operations face negative effects Organizations which mainly conduct business in energy and manufacturing will suffer adverse effects due to Rising costs associated with necessary raw materials and input materials occur for companies due to Indian Rupee (INR) depreciation.

The Impact of Macroeconomic Factors on Currency Volatility

A thorough analysis demonstrates that markets exhibit so much diversity that specific reviews are needed across all individual industries. A different process should be utilized to analyze distinct business elements because their unique market conditions affect currency fluctuations. capitalization changes. The stock market performance exists in a direct relationship with inflation and The changes in both interest rates and inflation rates generate movements in foreign exchange rates according to *Choudhry (2021)*. Currency Static inflation leads to depreciating currency and international market transactions at the same time. capital into stocks. The funding costs rise as inflation rates enhance borrowing rates. Market capitalization together with firm stability and profitability experience negative effects from this development. *Iqbal and Haider (2005)* conducted research to explore the impact of changes in financial and economic variables (2005) on market risks. The analysis focuses on financial and economic variables such as interest rates together with inflation rates as well as actual economic growth rates. Exchange rate volatility arises when such factors come into play according to the results of this assessment. influences stock market results. Market capitalization requires forecasting how currency fluctuations will affect it. An understanding of the complete economic conditions must be achieved through complete analysis. The worldwide economic environment plays crucial roles in shaping stock market performance according to *Bekaert and Harvey (2017)* relationships between exchange rate movements and stock market performance. New markets demonstrate increased currency volatility when global economic instability arises according to research findings. The observed reaction will lead to both increased capital outflows and lower stock market total valuation. The analysis of forex market effects on stock markets needs comprehensive methods because of their complex financial market connections.

Analyzing Currency Hedging and Associated Risks

Many businesses together with investors use currency hedging approaches to minimize the dangers related to exchange rate variations because these strategies reduce their likelihood of making financial losses. *Jorion (2020)* supports that business hedging produces both sturdy earnings stability and defense of market worth through currency exchange rate variations. Organizations succeed better during volatile currency markets through effective hedging strategies because they minimize their exchange rate exposure. Hedging strategies might generate implementation expenses, while their success depends on organizational traits and economic variables at the time. *Sivakumar and Sarkar (2008)* examined all accessible financial risk reduction strategies available to Indian enterprises in detail.

During that period, India lacked a currency futures market, which became a major challenge for businesses, causing them to rely mainly on forward contracts. The Reserve Bank of India recognized, according to *Obi (2003)*, both the need for currency convertibility and the value of introducing rupee futures for improving risk management techniques. *Lingareddy (2009)* conducted a study that analyzed Indian currency derivatives along with their future vs forward separations from September 2008 through March 2009.

The researchers conducted statistical tests that used correlation analysis and T-tests while evaluating standard deviation calculations and coefficient of variation to show currency futures created better efficiency in the foreign exchange market. The market changes in volatility stayed unchanged even with the introduction of currency futures. According to *Thunuguntla (2012)*, the Indian currency futures market exhibited significant

growth because of the major rupee depreciation during 2011. Research results demonstrate that Indian companies show limited knowledge about currency futures trading. Market efficiency improves when trading hours increase because this enables improved currency risk management.

A Review of the Impact of High-Frequency and Algorithmic Trading on Foreign Exchange Markets

High-frequency and algorithmic trading introduced new aspects into the operation of foreign exchange (FX) markets. As per *Detrixhe (2014)* the rise of high-frequency and algorithmic trading might improve the operational efficiency of the spot foreign exchange market. Stable exchange rates arise from the shortened duration of price discrepancies present in the foreign exchange spot market because of this enhancement. Improved trading procedures would adjust the currency market stock relationship through minimized volatility and increased trading fluidity.

Research Methodology

Research Design

The analysis of currency variations along with their effects on National Stock Exchange (NSE) market capitalization utilizes a statistical quantitative method in the Indian context. An empirical analysis based on historical data about exchange rates and stock market indices along with macroeconomic variables carries out this research study. The analytical strategy includes descriptive along with inferential statistical methods to study variable relationships.

Data Collection

This research extracts secondary data through a systematic collection from several information sources.

Exchange Rates:

The Reserve Bank of India and other financial databases including Bloomberg and Reuters provide the daily exchange rates between Indian Rupee and US Dollar. Exchange rate data is accessible from the Reserve Bank of India (RBI) and through Bloomberg and Reuters as well as other financial databases.

Stock Market Data:

The analysis incorporates data from the stock market about market capitalization and sector indices. Officials of the NSE can access data through their official website and more than one financial data supplier including CMIE. Prowess and Yahoo Finance.

Macroeconomic Variables:

Economic statistics including inflation rates together with interest rates and related economic markers come from data obtained from the Reserve Bank of India, the Ministry of Finance, and the International Monetary Fund.

The temporal scope of the investigation encompasses a decade, specifically from January 2013 to December 2023. The study selects this time span which contains different economic cycles to study significant currency shifts and demonstrates times of financial steadiness.

Data Analysis

Data exploration and data processing tasks unveil beneficial information that helps create decisions through conclusion-making processes. The research incorporates descriptive statistics with an econometric Model for its analytical techniques. The dataset produces statistical outcomes that present major traits using calculation methods for mean values alongside median numbers and

standard deviations along with correlation coefficient results. The introduced statistics reveal fundamental information regarding data distribution patterns as well as relationships among variables. The research analyzes NSE market capitalization data through linear regression for currency fluctuation effects assessment. This research account recognizes actual or potential weaknesses deriving from the financial records used through evaluation of their accuracy and completeness levels.

Constraints in Data and Ethical Implications

The research uses different data and different sources are used to verify information accuracy which improves the research reliability. Ethics considerations encompass the appropriate attribution of data sources and compliance with established data privacy standards.

Limitations of the Study

- The research is designed to be conducted over a specific duration of 10 years.
- The scope of the study is restricted to a select group of exchange rate currencies.
- The research primarily utilizes secondary data.
- The study considers only the NSE market capitalization rate.

Data Analysis and Interpretation

An economic study performed an analysis on how the USD/INR currency exchange rate influenced National Stock Exchange market capitalization. (NSE) market capitalization during the 2013-2023 periods through econometric analysis. An annual dataset enables extensive currency exchange effect analysis for market detection purposes. capitalization relationships.

Table 1 shows the values of Market Capitalization (MC) and USD/INR Exchange Rate (EX). MC variable represents the total market capitalization of the NSE, measured in billions of INRs. It broadly measures the total value of all listed companies on the exchange. At the same time, the EX variable denotes the average annual exchange rate between the Indian Rupee (INR) and the US Dollar (USD). It reflects the value of the INR relative to the USD.

Table No.1 Market Capitalization of NSE and US Dollar

Year	Market Capitalization (Billion)	US Dollar
2013	36842.78	43.5049
2014	51016.94	48.4049
2015	65334	45.7262
2016	61042.54	46.6723
2017	62745.6	53.4376
2018	65174.21	58.5978
2019	244505.59	61.0295
2020	95707.88	64.1519
2021	107185.06	67.1953
2022	13421.06	65.1216
2023	148106.8	70

Source: Authors own calculation

Model Specification and Estimation

We utilize a linear regression model to assess the influence of currency fluctuations on market capitalization. The model is specified as follows:

$$MCt=\alpha+\beta1EXt+\epsilon t$$

Where:

- MCt represents the market capitalization of the NSE at time tt.
- EXt denotes the USD/INR exchange rate at time tt.
- α is the intercept of the model.
- β1 is the coefficient that quantifies the impact of the exchange rate on market capitalization.
- ϵt is the error term, capturing the variability in market capitalization not explained by the exchange rate.

Table No.2 Regression Statistics

Multiple R	0.595504547151768
R Square	0.654625665678432
Adjusted R Square	0.574289769783334
Standard Error	49742.3920702362
Observations	10

Source: Authors own calculation

The above table shows a significant relationship between the dependent and independent variables in this study. As the dependent variable, market capitalization is positively correlated with the currency exchange rate. The estimated coefficient for the exchange rate reveals the direction and magnitude of the impact of currency fluctuations on market capitalization. A positive coefficient implies that a higher USD/INR exchange rate (indicating a depreciation of the INR) is associated with increased market capitalization. Conversely, a negative coefficient would suggest that a stronger INR relative to the USD negatively affects market capitalization. Also, the R-Square value of 0.6546 indicates that approximately 65.46% of the market capitalization variability is explained by exchange rate variations. This reflects a substantial portion of the variance being accounted for by the model. The Adjusted R-Square of 0.5743 adjusts for the number of predictors in the model, providing a refined measure of the model's explanatory power and accounting for potential over fitting. The standard error of 49,742.39 suggests that the model's predictions of market capitalization deviate from actual observed values by an average of this amount. This standard error represents the precision of the model's estimates, with a lower standard error indicating a more reliable prediction.

The statistical significance of the exchange rate coefficient becomes established when the p-value falls below 0.05 thereby validating currency fluctuations' influence on market capitalization. The main research question of this study's analysis produces evidence that USD/INR exchange rate movements create a notable effect on the market capitalization of the NSE.

Conclusion

The study proved that foreign exchange rate volatility affects NSE market capitalization levels significantly because of its critical implications for financial strategy management. Additional factors consisting of geopolitical risks and international trade policies should become future research topics

because of the growing worldwide integration of financial markets. Financial professionals along with policymakers should use these study results to promote resilience in their financial market systems. Between 2013 and 2023 this research investigates the way currency movement in the USD/INR exchange rates affects total stock value present on India's National Stock Exchange (NSE). The exchange rate demonstrates a strong positive connection to market capitalization based on the econometric analysis that sheds light on market value responses to currency changes. Market capitalization data demonstrates that depreciation of Indian rupee against the USD (an increase in exchange rate) leads to higher market capitalization levels. The statistical data shows that when the NSE's market capitalization grows it often leads to decreased value of the Indian rupee against the United States dollar. The analysis outcome may result from rising foreign investments and growing profitability of organizations which generate export revenues. The research outcomes demonstrate how exchange rate movements directly affect stock markets alongside investor market behavior.

Implications of the study

The results of this investigation present numerous significant implications. Declining exchange rates positively affect market capitalization values which demonstrate why investors must incorporate foreign exchange risks into their investment approaches. *Hong (2023)* demonstrates investors need to identify how currency shifts affect market value assessment. Portfolios should get adjusted to handle risks and seize investment opportunities which emerge due to currency value shifts. Exchange rate devaluation leads to changes in market capitalization that impacts economic stability by modifying financial investment choices. Market capitalization and economic stability shift together with investments as the situation requires immediate attention during proper decision making. decision making.

Future roadmaps of the study

Advancing studies about this topic should incorporate additional macroeconomic variables to create deeper understanding of market capitalization patterns. The study examines how different elements connect to exchange rate movements through their analysis. Factors such as inflation More extensive analysis may occur if economists include data such as inflation rates as well as interest rates and economic growth indicators. The research aims to increase knowledge about elements which influence market capitalization. Furthermore, broadening the scope Extended time horizons alongside new emerging markets within the analysis would provide enhanced insights to the research. deeper understanding of the mechanisms underlying currency fluctuations and their implications for financial markets. Research should explore the mechanisms which explain how currency exchange rates affect market capitalization across different markets. Scientific research must analyze market capitalization effects because of fluctuations while performing sector-specific studies to establish measurement methods. The analysis concentrates on how different industries react most significantly when exchange rates transform. This would Research efforts would help explain how currency changes differently affect disparate market sectors by developing a more extensive understanding of market reaction patterns. The research will lead to the creation of precise funding approaches and governmental intervention strategies.

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