

Exploring The Influence Of Diverse Technical Parameters On Share Price Returns: A Case Study Of The Banking Sector's

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Abstract

The primary aim of the current research endeavour was to investigate the profound influence of various technical parameters on the share prices of carefully selected companies within the Nifty Banking Index, as listed on the National Stock Exchange (NSE). Furthermore, this study sought to shed light on the notable disparities observed in the Moving Average (MA) of share prices across different banks that were specifically chosen for this analysis. The dataset utilized in this study was meticulously collected from NSE-listed banking sector companies, ensuring a comprehensive and relevant sample.

To gauge the impact of the diverse technical parameters on share price returns over a subsequent one-month period, a logistic regression model was employed. The findings revealed a commendable degree of accuracy in the model, as evidenced by a 63% correct classification rate for share price returns based on the data at hand. This outcome underscores the efficacy and precision of the logistic regression model developed for both the banking sector and the broader market.

By capturing and analysing the intricate relationship between technical parameters and share price movements, this research provides valuable insights into the dynamics of the banking industry. The results showcase the potential predictive power of the logistic regression model, enabling investors and stakeholders to make informed decisions based on the identified patterns and trends. Moreover, the observed disparities in Moving Averages among the selected banks highlight the distinctive performance and market dynamics unique to each institution.

Overall, this study contributes to a deeper understanding of the factors influencing share prices within the Nifty Banking Index. It underscores the efficacy of employing logistic regression analysis as a valuable tool for forecasting share price returns, demonstrating its accuracy and reliability. These findings offer valuable guidance to investors, analysts, and market participants, empowering them to navigate the complexities of the banking sector with increased confidence and precision.

Keywords: Nifty Index, Share Price Return, Banks, NSE.

Introduction

Share prices are influenced by a multitude of factors, including economic conditions, industry trends, investor sentiment, market psychology, news and events, and the interplay of demand and supply for shares. Of these factors, demand and supply serve as vital determinants of share prices, as they are influenced by the other aforementioned factors. Given that technical analysis is built upon the foundations of demand and supply, this study aims to examine the impact of various technical parameters on share price returns.

To achieve this objective, seven key technical indicators—namely Exponential Moving Average, Relative Strength Index, Moving Average Convergence Divergence, Rate of Change,

Stochastic Oscillator, and Volume Trading—were employed as predictor variables. Their influence on the market price of shares was rigorously assessed within the formulated model. Banks, as critical entities within the economy and financial system, play a pivotal role in offering essential services to individuals, businesses, and governments. Acting as intermediaries between savers and borrowers, banks collect deposits from individuals and businesses while providing necessary loans and credits to those in need. Moreover, banks possess the unique ability to create credit by extending loans, which contributes to supporting economic activity and enabling individuals and businesses to finance projects, expand operations, and fulfill their financial requirements. Notably, banks also play a significant role in capital formation by mobilizing savings and channeling them into productive investments. As the banking sector has witnessed a transition from traditional to e-banking and m-banking, researchers have directed their attention toward analyzing this sector to explore how various technical parameters influence the market price of shares.

This study stands out by delving deep into the interplay between technical parameters and share price returns, with a specific focus on the banking sector. By examining the intricate relationship between these parameters and market dynamics, this research aims to enhance our understanding of how technical analysis can inform investment decisions in the banking industry. The unique contribution of this study lies in its comprehensive analysis of technical indicators and their impact on share prices, offering valuable insights for investors, financial analysts, and market participants navigating the ever-evolving banking sector.

Rationale of the study

The rationale behind conducting this study on the impact of technical parameters on share price returns in the banking sector stems from several key factors.

Firstly, share prices are influenced by a multitude of factors, both fundamental and technical. While fundamental factors such as economic conditions and industry trends are commonly studied, the role of technical parameters in shaping share price movements deserves thorough examination. Technical analysis, which is based on analysing historical price patterns and market data, provides valuable insights into short-term price movements and market sentiment. By exploring the impact of technical parameters on share price returns, this study aims to

contribute to a more comprehensive understanding of the factors driving share prices in the banking sector.

Secondly, the banking sector plays a crucial role in the economy and financial system. Banks act as intermediaries, mobilizing savings from individuals and businesses and channelling them into productive investments through loans and credits. As the banking industry continues to evolve, with advancements in technology and the emergence of digital banking, it is essential to assess how these changes affect share price dynamics. Understanding the influence of technical parameters on share prices in the banking sector can provide valuable insights for investors, financial institutions, and policymakers, enabling them to make informed decisions and adapt to the evolving landscape.

Lastly, by focusing on the banking sector, this study addresses a specific area of interest within the broader financial market. The unique characteristics of the banking industry, including regulatory frameworks, risk management practices, and the interconnectedness of banks, necessitate a specialized analysis. By conducting an in-depth exploration of the impact of technical parameters on share price returns in the banking sector, this study aims to provide industry-specific insights and contribute to the existing body of knowledge in finance and investment research.

Overall, the rationale behind this study lies in the need to comprehensively understand the role of technical parameters in driving share price movements within the banking sector. By shedding light on this relationship, the study aims to provide practical implications for investors, financial institutions, and regulators operating in the dynamic banking industry.

Objectives of the Study

- To find out different technical parameters used by traders/investors.
- To measure the relationship between technical parameters and share price return.
- To examine the significant difference of Moving Average (MA) of share among different banks selected for the study.

Review of Literature

The research study titled "Exploring the Influence of Diverse Technical Parameters on Share Price Returns: A Case Study of the Banking Sector" delves into the relationship between various technical parameters and share price returns within the banking industry. To provide a comprehensive analysis, the study draws upon relevant literature from previous research in this field. The review of literature highlights key findings and insights from previous studies, contributing to the understanding of the subject matter.

In their seminal work, Prof. Nada Petrusheva and Igor Jordanoski (2016) conducted a comparative analysis between fundamental and technical analysis of stocks, revealing notable distinctions between the two approaches. Their findings underscored differences in time horizons, functioning, and execution methods employed in these analyses.

Han, Yang, and Zhou (2013) conducted a study emphasizing the superiority of moving average strategy compared to other forms of technical analysis. Their research demonstrated the strategy's ability to outperform buy-and-hold strategies, attributing this advantage to market timing, investor sentiment analysis, and insights into default and liquidity risks.

Mohd Naved (2013) explored the application of technical parameters, such as Moving Averages (MA), MA rules, and Moving Averages Convergence and Divergence, in the context of Nifty stocks. The study highlighted the objectivity of technical analysis and its ability to assist investors in making timely decisions amidst volatility and news flow.

Archana Mishra (2013) emphasized the importance of individual comfort and understanding when choosing between technical and fundamental analysis tools. While event studies and technical charts can be helpful, it is crucial to avoid biased interpretations and recognize the limitations faced by retail traders in making informed decisions.

Krollner et al. (2010) identified frequently used technical indicators for predicting stock market trends, including Simple Moving Average (SMA), Exponential Moving Average (EMA), Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), and rate of change (ROC). These indicators have been extensively studied and applied in the field of technical analysis.

Shahid Ahmed (2008) delved into the relationship between aggregate economic variables and stock markets in India. Analysing quarterly data from March 1995 to March 2007, the study examined the causal links between stock prices and key macro variables representing the real and financial sectors of the Indian economy.

By incorporating the insights and methodologies from these existing studies, the present research aims to build upon their findings and contribute unique perspectives to the understanding of the impact of technical parameters on share price returns in the banking sector.

Overall, the literature review provides a comprehensive understanding of the existing research and insights related to technical parameters and share price returns in the banking sector. The reviewed studies highlight the differences between fundamental and technical analysis, the superiority of moving average strategies, the practical application of technical parameters, the importance of individual preferences, and the relevance of frequently used technical indicators. This collective knowledge serves as a foundation for the present study's exploration of technical parameters and their impact on share price returns within the banking sector.

Sources of Data

The present study is based on the secondary data source. Secondary data consists of the daily share price data of the different banks selected for the study. The secondary data was collected from NSE websites, and Yahoo Finance website. The daily data commencing from January and ending with December of past ten years from 2009 to 2020 have been taken for the study. The data collected from this source has been converted to monthly format so that all periods for share price returns are mutually exclusive. The data collected have been compiled and used with due care as per the requirement of the study

Methodology

Table 1: Population & Sample

Sampling Unit	Nifty Banking Index
Universe/Population (N)	Nifty Banking Index = 12
Sample Size (S)	Nifty Banking Companies = 06
Sample Selection Criteria	Market capitalization more than INR 500 billion
Sampling technique	Judgment sampling

In this particular research study, the focus was on the Nifty Index of the Banking sector. The Nifty Index comprises a total of 12 banks listed on the National Stock Exchange. Using the Krejcie & Morgan formula for determining the sample size, a purposive sampling technique was employed to select a subset of companies from the Nifty Index of the Banking sector. Specifically, the study included six banks from the Nifty Banking Index as the sample.

To ensure the sample's representativeness, a criterion of selecting companies with a market capitalization exceeding INR 500 billion was applied. By setting this threshold, the study aimed to include banks with significant market presence and financial strength. This approach allowed for a focused analysis of larger banks within the Nifty Banking Index, providing valuable insights into the impact of technical parameters on share price returns in this specific subset of the banking sector.

By employing a purposive sampling technique and incorporating the criterion of market capitalization, the study aimed to ensure that the selected sample companies would effectively represent the larger banking sector within the Nifty Index. This approach contributes to the uniqueness of the study, as it narrows down the analysis to a subset of influential banks, enabling a more focused examination of the relationship between technical parameters and share price returns in the context of the Indian banking industry.

Variables for the Study

Dependent Variable: 30 Day Share Price Return (SPR)

Independent Variables

Relative Strength Index (RSI),

Moving Average Convergence Divergence (MACD),

Moving Average: 50 Day SMA – 200 Day SMA (MA),

Stochastic Oscillator (SO),

Rate of Change: Preceding 30 Day price return (ROC),

Volume Trading: Daily Traded Volume in millions (VT),

Model for the Study

$$\text{Logit}(p) = \ln \left(\frac{p}{1-p} \right) = b_0 + b_1 \text{RSI} + b_2 \text{ROC} + b_3 \text{VT} + b_4 \text{MA} + b_5 \text{EMA} + b_6 \text{MACD} + b_7 \text{SO}$$

Period of Study

The period of the present study was twelve years commencing from the year 2009 to year 2020.

Scope & Limitations of the Study

This research study focuses exclusively on the banks listed in the National Stock Exchange's Nifty Banking Index. The selection of these banks is based on their adherence to the financial reporting norms established by the Securities and Exchange Board of India (SEBI). Therefore, the analysis is limited to the selected banks listed on the National Stock Exchange. It is important to note that the study acknowledges and operates within the inherent limitations associated with financial data.

Hypothesis of the Study

H0: Current Market price of Share is not dependent on Change in Technical Parameters

H1: Current Market price of Share is dependent on Change in Technical Parameters

H0: Moving Average (MA) of Share is not significantly different among different banks selected for the study.

H1: Moving Average (MA) of Share is significantly different among different banks selected for the study.

Analysis and Findings

Goodness-of-fit Test of Logit Model

In logistic regression, the initial stage entails evaluating the appropriateness of the model's fit to the data. This is typically achieved through the utilization of statistical tests such as the

Table 2: Hosmer and Leme show Test

Chi-Square	Df	P-Value
12.11	6	0.06

Hosmer Leme show test. The null hypothesis assumes that the model adequately fits the data, whereas the alternative hypothesis suggests otherwise. In this particular study, the goodness of fit was evaluated using the Hosmer-Lemeshow test. The obtained results, presented in Table 2, indicated that the null hypothesis could not be rejected (p -value = 0.06). Consequently, it was concluded that the model effectively fits the data within a 5% significance level.

Logistic Regression Model Formulation

Initially, the logit model was formulated with all six predictor variables. Table 3 presents the estimated regression coefficients, standard errors of the regression coefficients, Wald statistics, and odds ratios. However, the results in Table 3 revealed that only three predictors, namely MACD, MA, and ROC, significantly contributed to the logit model at a significance level of 5%. Subsequently, the logit model was simplified by excluding insignificant predictor variables, and the outcomes are displayed in Table 4. H0: Market price is not dependent on Change in Technical Parameters H1: Market price is dependent on Change in Technical Parameters

Table 3: Initial Model Results

Initial model results	b	Standard Error	Wald Statistic	e ^b
RSI	0.011	0.010	1.279	1.011
SO	0.003	0.004	0.612	1.003
MACD	-0.043***	0.012	12.437	0.958
MA	-0.002**	0.001	3.780	0.998
ROC	-3.492**	1.717	4.138	0.030
VT	-0.004	0.003	1.413	0.996
Constant	-0.333	0.465	0.513	0.717

*** Significant at 1%, ** Significant at 5%

Source: - Logistic Regression output

Table 4: Final Model Results

Final model results	b	Standard Error	Wald Statistic	e ^b
MACD	-0.048***	0.012	15.586	0.953
MA	-0.003***	0.001	7.419	0.997
ROC	-2.642**	1.138	5.387	0.071
Constant	0.400	0.075	28.321	1.491

*** Significant at 1%, ** Significant at 5%

Based on table 4, in the final logit model, all the predictors demonstrate significance at the 1% level, indicating their importance in predicting the category of stock movement. The model can be expressed as follows:

$$\text{Logit}(p) = \ln\left(\frac{p}{1-p}\right) = +0.400 - 0.048MACD - 0.003MA - 2.642ROC$$

The e^{bi} represents the odds ratio for the predictor variables, indicating the relative increase in the odds of stock movement going up or remaining unchanged when the odds ratio value of MA and ROC increases by 1 unit. Conversely, the odds of stock movement decrease when the odds ratio value of MACD and MA & ROC RSI increases by 1 unit.

Accuracy of the Model

By employing logistic regression, the objective of the analysis is to assign observations to specific groups. This classification process involves estimating the probabilities associated with each group, which can be calculated using logistic regression. The classification table in Table 5 indicates that the percentage of accurately classified stock market movements is 63%.

Table 5: Classification Table

		Predicted Group		Percentage Correct
		0	1	
Observed Group	0	127	246	63.8%
	1	72	414	62.7%
Overall Percentage Correct				63.0%

H0: Moving Average (MA) of Share is not significantly different among different Banking companies selected for the study.

H1: Moving Average (MA) of Share is significantly different among different Banking companies selected for the study.

Table 6: ANOVA Output

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1568141	5	313628.3	12.0613	0.00	2.224611
Within Groups	22154442	852	26002.87			
Total	23722583	857				

Source: - ANOVA Output

The analysis of the data presented in the table reveals a significant finding. The calculated p-value of 0.00 is lower than the critical p-value of 0.05, leading to the rejection of the null hypothesis. This indicates that the moving average of share prices significantly differs among the various banking companies included in the study. The results provide strong evidence to support the notion that there are notable variations in the moving average values among the selected banking companies, emphasizing the importance of considering individual bank performance when examining share prices. This unique finding highlights the distinctiveness of each bank's share price trends and further underscores the significance of the study's focus on the banking sector.

Findings

Six technical parameters consist of Relative Strength Index (RSI), Moving Average Convergence Divergence (MACD), Moving Average: 50 Day SMA – 200 Day SMA (MA), Stochastic Oscillator (SO), Rate of Change: Preceding 30-Day price return (ROC), Volume Trading: Daily Traded Volume in millions (VT), have been identified to know the impact on share price return of different banks selected for the study. In case of Banking, out of these technical factors, only three factors namely MACD, MA & ROC are having significant impact on the future share price return of shares of Banks selected for the study. The coefficients of MACD are -0.048, MA is -0.0026, ROC is -2.642 and constant is 0.399 respectively.

Conclusion

This study effectively develops a logit model utilizing logistic regression to forecast stock market trends. Through the implementation of logistic regression, the study identifies the key technical indicators for predicting stock market movements based on historical data spanning from January 2009 to December 2020, which are MACD, MA, and ROC. The validation results demonstrate an accuracy rate of 63%, which is satisfactory. The validation results indicate that the formulated logit model demonstrates satisfactory performance, as it correctly classifies more than half of the data. The stock market holds significant value by offering distinctive advantages and services to businesses, individual investors, and governments. This research aims to provide valuable insights to individuals engaged in the stock market. It is crucial to identify the primary factors that exert influence on stock price fluctuations in order to achieve

desired profits. This knowledge will aid in enhancing or sustaining the performance of price movements and attaining target profits. This paper focuses solely on utilizing the statistical logistic regression approach for predicting stock market movements. However, to enhance the accuracy of forecasting with recent stock data and more significant technical indicators, it is advisable to explore alternative approaches such as discriminant analysis and multiple regressions. By incorporating these approaches, a broader range of methods can be utilized to improve the accuracy of stock market movement predictions.

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