AN IMPACT OF DIFFERENT TECHNICAL PARAMETERS ON SHARE PRICE RETURNS: A CASE STUDY OF BANKING SECTOR

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ABSTRACT

The main objective of the present study was to find out the impact of different technical parameters on share prices of selected Nifty Banking Index companies listed on NSE. The present study also highlights the significant difference in the Moving Average (MA) of share prices among different Banks selected for the study. The present study was conducted on the data collected for NSE listed Banking sector companies. The logistic regression model was used to know the impact of different technical parameters on share price returns for next one month period. The results shown that the percentage of correctly classified share price returns is 63% using our data. These percentage shows that the logistic regression model framed for both the sector is good and accurate.

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

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Introduction

Share prices can be influenced by various factors, including: economic conditions, industry trends, investor sentiment, market psychology, news and events and demand and supply for the shares. Demand and Supply is one of the vital factors in determining share prices as all of the other factors influence the demand and supply of the stock. As technical analysis uses demand and supply as its foundations, we try to study impact of technical parameters on share price returns.

In the model formulation, seven 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 to assess their influence on the market price of shares.

Banks play a crucial role in the economy and financial system, offering a wide range of services that are important for individuals, businesses, and governments. Banks act as intermediaries between savers and borrowers. They collect deposits from individuals and businesses and provide loans and credits to those in need. Banks have the ability to create credit by extending loans to borrowers. This credit creation process supports economic activity, allowing individuals and businesses to finance projects, expand operations, and meet their financial needs. Banks play a significant role in capital formation by mobilizing savings and channeling them into productive investments. The banking has witnessed increasing growth from traditional to e-banking, m-banking etc. Consequently, researchers have focused on analyzing the Banking sector to investigate how various technical parameters affect the market price of shares.

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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

Prof. Nada Petrusheva, Igor Jordanoski (2016) has made comparison between the fundamental and technical analysis of stocks. They found that fundamental and technical analysis differs in many aspects like time horizon used, functioning and execution.

Han, Yang and Zhou (2013), state that moving average strategy is superior to other types of technical analysis as it performs superior timing portfolios that outperform buy-and hold strategies (Han, Yang & Zhou, 2013). They provide advantages over other forms of analysis due to market timing ability, investor sentiment, default and liquidity risk analysis and insights, thereby giving superior advantage to competitors.

Mohd Naved. (2013) has studied Technical parameters such as Moving Averages (MA), MA rules and Moving Averages Convergence and Divergence and its application on Nifty stocks. He finds out that the objectiveness in the technical analysis helps investors in taking timely decisions on stocks without getting confused due to volatility and news flow.

Archana Mishra. (2013) the choice of trading approach depends on an individual's comfort and understanding of technical or fundamental analysis tools. While event studies and technical charts can be helpful, it is important to avoid biased interpretations and acknowledge the limitations of retail traders in making informed decisions.

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

Shahid Ahmed (2008) has investigated aggregate economic variables and stock markets in India. This study shows the nature of causal relationship between stock prices and the key macro variables representing real and financial sector of the Indian economy for the period March 1995 to March 2007 using quarterly data.

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 2011 to 2022 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

The present study was conducted by taking Nifty Index of Banking sector. A total of12Banks have been listed in Nifty Index of Banking of the National Stock Exchange. Out of Nifty index companies, total 06 banks from Nifty Banking Index have been selected for the study by applying the Krejcie & Morgan formula of determination of sample size. Purposive sample technique was used for selection of the sample companies from Nifty Index of Banking sector. The companies having more than INR 500 billion have been selected as a sample to conduct the study.

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

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

Period of Study

The period of the present study was twelve years commencing from the year 2011 to year 2022.

Scope & Limitations of the Study

The analysis of this research is confined to the selected Banks which are listed to the National Stock Exchange's Nifty Banking Index. The reason is that the listed companies are required to follow the norms set by the Securities and Exchange Board of India (SEBI) for financial reporting. This study is only limited to the selected Banks listed in the National Stock Exchange. Further, this study possesses all the inherent limitations of the 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 Hosmer-Lemeshow 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.

Table 2: Hosmer and Leme show Test

Chi-Square	Df	P-Value
12.11	6	0.06

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%

Source: - Logistic Regression output

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:

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

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

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

Source: - ANOVA Output

It has been evident from above table that, P calculated value is 0.00 which is less than the P critical value of 0.05. Hence, null hypothesis is rejected. Therefore, moving average of share is significantly different among different Banking companies selected for the study.

Findings

Six technical parameters consists 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 is -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 2011 to December 2022, 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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