

AN EMPIRICAL STUDY OF RELATIONSHIP BETWEEN MARKET INDEX AND AUTO SECTOR INDEX

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ABSTRACT

This research summarizes the relationship between market index and Auto Sector index. For analysis, NIFTY50 INDEX has been taken as a market indicator (independent variable) and NIFTY AUTO INDEX has been taken as Automobile Sector Index (dependent variable). The duration of the study was taken nineteen years from January 2003 to December 2022. To evaluate to the relationship, correlation and regression has been applied through E-views12 to understand the relationship between the market index and the automobile sector index. The Granger causality test has also been applied to check the interrelationship between these two variables. The study conclude that the nifty Auto index has strong positive relationship with the nifty fifty index , regression test result reveals fluctuation of nifty fifty index has impacted the functioning of nifty auto index and Granger causality test results predict the presence of long term bidirectional causality between variables.

Keywords: Nifty Fifty Index, Nifty Auto Index, Correlation, Regression, Granger Causality Test

INTRODUCTION

With continues growth and expansion of growing opportunities ,our Indian economy has been considered to became third largest economy in world in few years .Growth of the economy is highly correlated or depend up on the performance of Indian stock market. We have the oldest stock market which is called (Bombay stock Exchange) BSE. Stock market is a place where registered company's got chance to raise funds to expand their business or give contribution in the growth of economy. Now days stock market position gets more clear and strong in terms of saving investors from fraud and from any kind of scam that has happened in past .when many fraud brokers take the money of innocent investors by doing false marketing or by spreading rumors about market position but this all has stopped now due to digitalization of every step of share buying and selling activity. In the growth of stock market automobile industry play a very impotent role. Our automobile industry is the main pillars in the growth of Indian capital market as well as Indian economy. Indian auto sector contribution in national GDP is 2.77 per cent in 1992-1993 but it is 7.1 per cent in 2023.for future perspective India wants its auto industry to double its in size like15

lakh crores by 2024. Automobile industry contribution for the growth of Indian economy has been done by many categories like as 7.1 per cent contribution GDP, 37 million jobs are generated, 40 per cent share in global research and development and 4.7 per cent share in India's export. Automobile industry differs from other industry of India in so many terms. Thus, it creates a great prospect for investors & market players in terms of getting good return.

Nifty Fifty Index

Nifty fifty indexes came into operations on 20 April 1996. Nifty fifty Index represents weighted average of largest fifty Indian companies from different sector which are listed on the national stock exchange. NSE indices own the Nifty Fifty and manage all its operations. Top thirteen sectors of the Indian economy have been covered by the Nifty Fifty index and Nifty Fifty index offers a large managed exposure to the Indian investor in one portfolio, Nifty Fifty has allotted a weighted to all the thirteen sectors in which automobile sector has 5.84 per cent weightage.

Nifty Auto Index

Nifty Auto index is a tool of performance measure for automobile industry as automobile sector plays a pivotal role in the growth of the Indian economy. Nifty auto index consist those companies which perform best in automobile sector. From automobile sector top 15 stocks of different companies comes under Nifty auto index. Nifty Auto Index shows the behavior and movement of the automobile companies on the basis of their stocks returns.

REVIEW OF LITERATURE

This research paper "An empirical study of relationship between market index and auto sector index" has been analyzed by taking nifty fifty indexes as market index and nifty auto index as auto index. The research examined the long-term symmetrical relationship between Nifty Fifty Index and Nifty Auto Index through the application of regression, correlation and granger causality test.

Kalimuthu (2023) research for the linkage between Indian festivals and stock market returns and to do the research secondary data has been taken from (January 2016 –December 2021). Tools used for the study are descriptive statistics and paired t-test

to study the after and before effect of festivals on return of sectorial indexes and at last granger causality test applied to check the directional behavior of different indexes return towards festivals. According to the study conclusion Ramadan and Diwali are the two main festivals that have positive impact on Nifty fifty and other sectorial indexes and maximum selling and buying of product has also been done during these festivals that give positive boost to the stock market (Kalimuthu, 2023).

Alexander (2022) investigates the correlation between certain macroeconomic factors and the S&P BSE Auto index over the period of 2017 to 2019, during which the Indian automotive sector had its most significant decline in sales. The current study uses an (ARDL) technique to co-integration the data. Which finds that there was evidence of long term co integration between both the selected sectors. On the other hand, the S&P BSE auto index is shown to be significantly influenced in the short term by the crude oil price and the car index's lag values. The research comes to an end. (Alexander et al, 2022) .

Nagendra (2021) analysed the NSE NIFTY Fifty and its association with sectorial indexes by using statistical tool correlation and by taking data from (2006 -2010). This study includes sectorial indexes name as, Auto sector index, Bank Index, FMCG sector Index and Energy Index. From the study it can be suggested that NSE NIFTY influence the functioning of other sectorial indexes but PHARMA and FMCG are less influence than other sectors indexes (Marisetty, 2014).

Victor *et al.*, (2021) investigate the between different index and the NSE Nifty Fifty index. Further study 13 years of data has been taken from 2005 to 2018 for analysis daily exchange rates has been considered name as USD, JPY, and GBP to INR along with daily price movement of NSE NIFTY Fifty. Both Long –run as well as short-run relationship between NSE NIFTY and different exchange rates has been analyzed by using integration, Granger Causality Test and VAR model. At the end Research concludes that long run linkage exists between different exchanges and NIFTY FIFTY and granger causality test result indicate a causality between the variables which is bidirectional. The result implies that variations are most happened in short run as compared to long-

run so investors are advised to have watch on variation cautiously if they want to invest for short period.

Subburayan (2020) analyzed the effect of volatility exchange rate on BSE (BOMBAY STOCK EXCHANGE) sectorial indices. The present study used data from 2014 to 2018 to analyze the volatility of exchange rate by using tools like descriptive statistics ,regression correlation Johnson co –integration test and GARCH model. The research concludes that there prevail a long term symmetrical linkages in between exchange rate with the price movement which affects the Indian stock market. Through descriptive statistics jarque bera value it can be said that data does not show normality. GARCH model application shows presence of high volatility in BSE sectorial Indices. Study also suggests any fluctuation in exchange rate negatively affect the stock prices of BSE.

Katoch (2019) examine the co-relation between NIFTY 50 Index and macroeconomic dynamics. Approach of Study used ARDL (auto regressive distributed lag order) and granger causality test to study the effect of macroeconomic variable on stock price movement of NIFTY Fifty Index and for this 12 years date have been collected from (2006 to 2018). Research used total industrial production, money supply in the narrow sense. At last, this revisiting causal relationship study conclude that in a short run these macroeconomic variables have no bidirectional relationship with each other and less variation exists in movement of stocks price for short run. But consumer price index has no cause relationship with the movement of stocks price as compared to other macroeconomic variable in short run.

Prasad (2016) examines the relationship between Nifty Fifty and selected shares in NSE. Selected share in NSE is TCS, Reliance, HDFC Bank, ITC. Selected companies share price has been taken from (2012-2016) on daily basis and to analyse data coefficient of correlation statistical tool has been used. This study concludes that HDFC Bank, TCS, Reliance have strongly positive correlated with NIFTY FIFTY except ITC which have moderate positive relationship.

Naik (2013) analyses the share market reactions to macroeconomic fundamentals by doing trend analysis of data. For analysing the impression of

macroeconomic variables about the behaviour of stock market, data for study has been taken on monthly basis. Macroeconomic variables namely inflation, short-term interest rate, and other tools used to study the variables are johansen co-integration, correlation model and Granger causality. At the end it concludes that impact of money supply and industrial production has positive impact as compared to inflation which has negative impact on stocks prices.

Naik (2012) do the research to analyze the impression of macroeconomic variables on stocks prices reinvested: Evidence from Indian companies. Data for research has been taken from (1994:4-2011:06) to analyse the long-term linkage between BSE SENSEX and macroeconomic factors name as whole sale price, treasury bill rates. The result of the research concludes that stock market Index and macroeconomic factors have existence of long-term equilibrium between them.

Lu jun (2022) studied the volatility of a financial time series, the SVR-GARCH model which has a tendency to "backward eavesdrop," meaning that it will simply make the prediction by diverging from the historical volatility. To solve this sort of issue and forecast better peak or trough behaviors, researcher suggests using a blended ARCH (BARCH) and an enhanced BARCH model. The SH300 and S&P500 are two genuine data sets that are used to demonstrate the approach. The empirical findings indicate that the capacity to anticipate volatility is enhanced by the augmented and blended models.

Prabu (2021) analyzed that the COVID – 19 pandemic has a very series deterioration effects on stable functioning of economic of various countries of world. Social environment of country has a direct relationship with functioning of many industries that has been destroyed by the covid-pandemic . All the trade restriction during pandemic have disturbed the performance of automobile industry. Major source of profit for automative industry in India is based on consumers from UK,Germany and China. Hardness of pandemic interrupt the trade regulation between India and these countries. Which impact negatively on Indian automobile industry. But these negative effects are countered by huge demand of cars by Indian consumers.

Marobhe (2019) this study was conducted at Dares Salaam Stock Exchange to simulate the volatility of stock returns. Exchange (DSE) from January 2, 2012, until November 22, 2018, employing daily closing stock price indexes. Two types of modeling were used: auto regression GARCH models EGARCH models. The results demonstrate (3) models were significant in predicting the volatility of stock returns and other analyses shown that the size of volatility stocks increases with as opposed to negative news. The E-GARCH model demonstrated impact connected to stock returns that may be deteriorate the trading capital structures of businesses. P-GARCH (1,1) was discovered.

Rahman (2022) this study's primary goal is to empirically investigate the appropriate volatility models for a few chosen pharmaceutical businesses listed on the Bangladesh Stock Exchange (DSE), such as Square, Beximco, Beacon, IBN SINA, and Orion Pharmaceuticals Ltd. The information includes the daily log returns for 667 days, from January 28, 2019, to December 30, 2021, computed using the closing prices of these five chosen firms. The stylized company information for the sampled firms is shown in the first section of the analysis. Afterwards, many best-fitted models for various pharmaceutical businesses were discovered by using both symmetric and asymmetric GARCH models. GARCH(1,1) residual diagnostics and our model selection criteria, AIC, SBIC, and Log-Likelihood is thought to represent more suitable models for Square Pharmaceuticals Ltd. and Beacon Med.

NEED OF THE STUDY

It has been observed that past researches were based on the relationship and impact of macroeconomic variables with sectorial indexes and BSE SENSEX stocks prices. The bunch of these studies were conducted in India as well as foreign, to investigate the impact and spillover effect of macroeconomic variable by taking sectorial indexes name as Bank, FMCG, IT, Metal, Pharma Index except Nifty Fifty and Nifty Auto. As we all know NIFTY Fifty index represent 50 stocks portfolio and it also include stocks of Auto Sector. So, this study will analyze the relationship, impact and granger causality direction between NIFTY Fifty and NIFTY Auto index. Therefore, this study will be helpful to know whether long

term relationship exists between these two variables or whether nifty Fifty Index ups and down have impact on Nifty Auto Index and this study will also reveals that what kind of directional relationship exist between Nifty Fifty and Nifty Auto. And this study will also help investor to whether to consider or not the variation of Nifty Fifty Index before investing in Nifty Auto Sector 's Automobile companies.

OBJECTIVES FOR THE STUDY

- To analyse the relationship between Nifty Fifty and Auto Sector.
- To identify the effect of Nifty Fifty on Auto sector.
- To examine Granger cause between Nifty Fifty Index on and (Nifty Auto Index).

RESEARCH METHODOLOGY

Sample Size

- Nifty Fifty as market Index and Nifty Auto to as an Auto index represented and selection have been done.

Duration of the Study

- For the study data from January 2003 to December 2022 has been taken.

Data Used For Study

- Stocks prices of Nifty Fifty and Nifty Auto has been collected on monthly basis from National Stock Exchange (NSE) official website.

Tools for Analysis

- This study used correlation, Regression and Granger causality Test used to analyse data.

Correlation Analysis

is used to study the relationship between dependent variable or independent variable. It's a statistical analyses to review the possible linear relationship between dependent and independent variables.

Regression Analysis

In this chapter, the statistical tool Regression has been applied for analyzing the effect of the Nifty50 Index on the Nifty Auto Index. The values of the Nifty50 Index and Nifty Auto Index are based on closed prices. A regression test has been applied for analyzing the effect of the independent variable

(Nifty50Index) on the dependent variable (Nifty Auto Index) and observing how significant a difference was made in the dependent variable due to the change in the independent variable.

Granger Causality Test

Granger causality test has been put on the Nifty 50 Index and Nifty Auto Index to analyze the causal relationship and identify the direction of influence. The Granger causality test is hypothesized to know the causal relationship between selected.

Null Hypotheses

H₁: There is no significant relation between overall market index and automobile sector index

H₂: There is no relationship between Nifty Fifty Index on the Nifty Auto Index

H₃: Nifty Fifty prices does not Cause the Price of Nifty Auto Index.

H₄: Nifty Auto Index price does not Cause the Price Nifty Fifty Index.

ANALYSIS AND INTERPRETAION

Correlation Analysis

H₁: There is no significant relation between overall market index and automobile sector index

Table 1: Correlation of Nifty 50 with Nifty Auto

Adjusted R- square	0.618874
(F-statistics)	393.9614
Prob.	0.000000

Source: Researcher Computation over E-Views 12

Interpretation

The above Table 1 comprises Regression analysis for Nifty Auto Index and Nifty Fifty, in which nifty auto is taken as the dependent variable, and Nifty Fifty took as the independent variable for analyzing the relationship between Market Index and Nifty Auto. The value of the Adjusted R-square is 0.618 which indicates a 61.8 per cent Change in the dependent variable due to a change in the independent variable. It can be said that the Nifty Auto Index’s price is significantly affected by the Nifty50 Index’s price. The P-value is 0.00 which is less than 0.05 level of significance, signifying rejection of the Null Hypothesis, thus it observed that, there is a significant impact of Nifty Fifty Index on Nifty Auto Index for the selected period of the study.

Regression Analysis

H₂: There is no significant relationship between of Nifty Fifty Index on the Nifty Auto Index

Table 2: Regression Output Table

Variable	Coefficient	Standard Error	t- Statistics	Prob.
C	815.4140	531.0710	1.535414	0.012
NIFTY50PRICE	1.184370	0.059671	19.84846	0.0000
R-Square	0.620449			
	NIFTY50	NIFTY AUTO		
NIFTY50	1.0000	0.78768		
Nifty Auto	0.78768	1.0000		

Source: Researcher Computation over E-views 12

Interpretation

The above Table 2 comprises the value of Correlation. The table shows a correlation between

the Nifty50 Index and the Nifty Auto Index with a value of 0.787 indicating that Nifty Auto Index is highly positively correlated with Nifty50 Index.

Granger Causality Test Analysis

Table 3: Pairwise Granger Causality Test

Pairwise Granger Causality test			
Null Hypotheses	F-Statistic	Probability	Null Hypothesis Status
NIFTY 50 price does not Cause the Price of NIFTY AUTO INDEX	2.05491	0.0035	Rejected P- value <0.05
NIFTY AUTO price does not Cause Price NIFTY 50	2.7961	0.0412	Rejected P- value <0.05

Source: Researcher Computation over E- views 12

Interpretation: In the Above table 3 after the application of the Granger Causality test it is observed that Nifty 50 Price has a significant relationship with on the Price of Nifty Auto. The p-value is 0.0412 for the Nifty auto index and the significant probability is 0.035 for the Nifty 50, in

both pair, P-values are less than 0.05 so null hypotheses are rejected. At last, it can be suggested that the Nifty Auto price is much affected by the Nifty50 price and there is a presence of Granger cause in both cases. Which shows the presence of Bidirectional causality?

Table 4: Composite Correlation of Nifty Auto Index with Selected Automobile Companies

	Nifty Auto Price	Ashok Leyland	Bajaj	Hero	Eicher	M_m	Maruti	Tata	Tvs
Niftyautoprice	1	0.907	0.934	0.973	0.937	0.959	0.912	0.734	0.613
Ashok_leyland	0.9077	1	0.878	0.902	0.960	0.892	0.948	0.535	0.673
Bajaj	0.9343	0.878	1	0.957	0.914	0.938	0.904	0.622	0.755
Hero	0.9736	0.902	0.957	1	0.928	0.957	0.906	0.693	0.641
Eicher	0.9375	0.960	0.914	0.928	1	0.888	0.970	0.567	0.736
M_m	0.9596	0.892	0.938	0.957	0.888	1	0.869	0.725	0.574
Maruti	0.9120	0.948	0.904	0.906	0.970	0.869	1	0.445	0.810
Tata	0.7346	0.535	0.622	0.693	0.567	0.725	0.445	1	0.042
Tvs	0.6130	0.673	0.755	0.641	0.736	0.574	0.810	0.042	1

Source: Researcher Computation through MS-Excel

Interpretation

The above table 4 comprises of correlation of Nifty Auto with selected Auto Companies, Hero Motors has a highly correlated value of 0.97 with Nifty Auto whereas Mahindra And Mahindra has a 0.95 correlation with Nifty Auto, followed by Eicher and Bajaj Auto have 0.937 and 0.934 respectively, Ashok Motors has a correlation value of 0.90 although Tata Motors has 0.73 positive correlation while TVS Motor has very least correlation value of 0.61 among selected Auto companies

CONCLUSION

After applying Regression Model, it is found in the Relationship between the Nifty Fifty Index and with Auto Sector Index in which Nifty50 is taken

as Market Index and Nifty Auto is taken as Auto Index, it can be said there is a strong relationship between the Market indexes with Auto sector Index. There is a parallel trend found that the Nifty auto sector follows with Market Index (Nifty Auto) it can be Upward or downward by the increase in price or decrease in price. The P-value is 0.00 which is less than 0.05 level, signifying rejection of the Null Hypothesis, thus it observed that, there is a significant impact of Nifty Fifty Index on Nifty Auto Index for the selected period of the study. Nifty Fifty and Nifty Auto have strong positive relationship. Bidirectional causality found between these two variables due to their significance p-value which is less than 0.05 levels indicate that there

were presences of long-term equilibrium between variables. Investor can invest in auto sector without any hesitation for long-term but for short-run they need to follow the ups –downs of Nifty fifty Index. Table 4.4 which shows the composite correlation of Nifty Auto Index with Selected Automobile Companies reveals strong positive relationship of Nifty Auto Index performance depends up on working performance of Automobile sector.

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