

PROGNOSTICATION OF STOCK PRICE AND PERCEIVING THE RELEVANCE OF MACRO-ECONOMIC FACTORS WITH INDEX

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Abstract

In this research paper, different macro economic factors have taken for stock market prediction such as GDP, Inflation rate, Forex, IPI and FII are taken. Individual analysis of these macro-economic factors and stock market like correlation and regression is done to know about the relationship between independent and dependent variables. The overall relationship of macro-economic factors with stock market (Nifty 50 Index) is done by multiple regressions. From the results, we identified the strength of relationship between macro-economic factors and stock market. For stock price prediction company analysis is done. Top five sectors were chosen under which top 5 companies were selected for analysis.. After the company analysis, stock prices of these selected companies were predicted using ARIMA model. These predicted values helped to find the price band of each company. This price band gives the entry point and exit point for short term investors to make the profit. Based on this research, we concluded the importance of macro-economic factors to predict the stock market movement and stock price prediction to gain from the price band. This research will help both short term and long term investors make profit from investing in stocks.

Keywords: GDP, Inflation, IPI, Exchange rate, FII, Volatiltiy , ARIMA and Stock Prediction

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Introduction

People in general want to multiply money and earn huge profits. They go for stocks as they can gain huge returns. Mostly investing in stock market is considered as gambling by many. They invest their money without proper understanding of how stock market works. They ignore the analysis part and trade like gamblers. Through this research, we prove that both stock prices and sock market can be predicted to benefit both the short term and long-term investors. An economy's health is very important and it depends on stock market. It acts as a measure. The stock market depends on various macro-economic factors like average inflation rate, GDP, exchange rate, forex reserve, average inflation rate, unemployment rate. They are responsible for the change in the stock market. They often tell the economic growth. If the growth is high then the stock market gives more profit. If the growth is low then it affects the stock market. The prediction of stock market can give more profits to the long-time investors. Traders should know when and where to invest in stock market and macro-economic factors play an important role in it.

Statement of Research problem

Many people see stock market a place for gambling. Is stock market a lottery? (Gong et al, 2021). People consider stock market as a lottery prize and invest money. Some have no knowledge of how stock market works. They blindly put their money in high hopes of winning the game. Understanding the stock market and factors that influence stock market is important. This helps us to gain profit in long run and maximize the wealth. Macro-economic factors play an important role in predicting the stock market.

Research Gap

Many research articles have explained the relationship between GDP, inflation rate, Foreign Exchange Rate with stock market. The IPI (Industrial Production Index) should be considered as an important factor to predict stock market. Do IPI have direct influence on stock market? How reliable is IPI in stock market prediction? Which stocks should we buy, when IPI is positive (growing)? And how other factors influence the movement of stock market and the level of impact must be measured.

These are the questions to be answered by this research and helps layman to see stock market as a meaningful platform to invest money.

Scope of the Research

For predicting the stock market we have many macro-economic factors but in our study we take the macro-economic factors like inflation rate, GDP, Foreign Exchange Rate, IPI, and FII to predict the stock market movement. Post COVID growth of stock market is predicted. We also predict stock prices of five sectors by choosing top five companies under each sector.

Objective

- To find which macro-economic factor has greater impact on stock market movement.
- To predict the stock market using macro-economic factors to benefit long term investors.
- To predict stock price of selected companies under different sectors to benefit short term investors.
- To find the entry and exit level point using ARIMA model.

Theoretical Framework

Poterba & Summers (1984) examined the volatility in the stock market is weakly correlated. The stock market is impacted only by a bit by the volatility shock. This shock only pertains for very short periods or short intervals. The influence of volatility is very less in stock market. Agarwal (2021), said the environment in stock market is volatile. Growth of the economy is influenced by the stock market. Securities are traded and transacted in the platform provided by the stock market. Small investor's savings are mobilised for fund in Indian stock market. The shares traded in the secondary market shows fluctuations in the price. The volatility refers to these fluctuations in stock market. Karthigeyan & Shanmugam (2020), said the Indian stock market is in rapid growth since 2003. This helped to get more inflows of capital in India. Market equilibrium decides the behaviour of the stock market. When share prices are increased the investors get high capital gain according to their risks. The traders withdraw themselves from the market if the share prices go down.

Yarovaya et al, (2021) During COVID – 19 the Indian stock market saw the highest drop after Harshad Mehta scam in 1991. Bombay Stock Exchange 13.2% SENSEX index fall on March 23, 2020. The National stock Exchange (NSE) had its NIFTY index fall to 29% on March 23, 2020.

This event was named as “Black Swan Event” by some economists as it was unexpected. In COVID – 19 both the demand and supply chain got affected Papadamou et al, (2020) During COVID the volatility rose and has affected the return in stock market negatively. The risk aversion was the result of the pandemic situation. These effects had large impact in Europe than any other countries in the world. The stock market experienced stock market aversion because of the people’s anxiety of contagious effects of COVID. Anxiety due to googling about the COVID has increased the risk aversion in stock markets of Europe Yadav, (2017) discussed the stock market volatility is caused by the factors like credit policy, economic growth, international trends, dividend yield policies, economic cycles, political variables, corporate earnings, inflation rate, financial rate, general business conditions, bond prices, financial leverage any other macro-economic variables. Another reason for stock market volatility is due to the speculation in the stock market. This leads to deviation of stock prices from their intrinsic value. Financial information plays an important role in stock market. The financial news obtained by the people, makes changes in the stock market trend. So stock market reacts both to positive and negative news Granero et al, (2012). Pathological gambling exists from old age. Gambling is impulsive and gamblers are not easy to give up. Due to this, they lose money, become defaulters, their family life is broken, and find illegal means to earn money. Gambling is in many forms. Previously, people bet on horses and other animals, used cards etc. Now betting is done in online mode. Many people including rich, old, younger, educated are involved in different forms of gambling. Stock Market Investment is another form of gambling, where people invest money to get higher returns. Financial investment should consider liquidity, profit and risk. The higher the return, higher is the risk Mosenhauer et al, (2021). People investing in stock market want a jackpot. It is highly related to lottery system. In early works male investors were proved to be involved in stock market gambling. The blue collar individuals involve in stock market gambling. The excitement in lottery and stock market are same (Dorn et al, 2015). In stock market frequent trading is a problem. People lose their returns by trading frequently. This is mainly caused by the confidence of the investors. The investors are over confident and decrease their returns. Another factor is the financial literacy. People or investors are not financially educated. They consider it more as a gambling platform. Garg & Kalra, (2018) In India one of the earliest exchanges is the SENSEX. NSE (National Stock Exchange) is considered to be good platform due to the advancement in technology and sophistication. The whole world was attracted to Indian market, when India went for globalization. This made stock market grow enormously. Many macro-economic factors affect stock market they are inflation, unemployment rate, exchange rate, gold and foreign exchange reserve and GDP). Parab, (2020) The economic condition and stock market is dynamic. The causal relation between the macro-economic factors and stock market can be found to minimize volatility. This can easily help the investors or assist them in stock market. Fahlevi et al, (2020). Inflation is the increase of price for general goods and services. If there is increase in inflation rate then there are uncertain investments possible. The investments will become conservative and there will be low economic growth. More resources can be wasted by the companies or firm to deal with inflation (Gokal & Hanif, 2004). If there is increase in the price continuously then it affects the economic life of people. Inflation is of many types based on severity, causes and principle. In severity we have mild, moderate, severe and hyperinflation. By cause it has two types demand pull and cost push inflation. Based on principle it is classified as domestic and imported inflation.

Dynan & Sheiner, (2018) GDP (Gross Domestic Product) determines the welfare of the country. It is also known as, “Aggregate economic wellbeing”. It is the worth of goods and services produced

by the country less the worth of goods and services used for production (Bureau of Economic Analysis). Home production is excluded in GDP. Investments are also included in the GDP. From ancient times foreign exchange has been followed. Here traders pay other with their country money. Violeta (2020) the FOREX is the Foreign Exchange Market, where international banks and small speculators invest money. It is the currency trading against the other currency. This is considered to be the largest market in the world. Major currencies traded are EUR, USD, JPY, GBP, CHF etc. The traded currency is always in pair one is called as base currency and the other is called counter currency. We buy the base currency and sell in counter currency value Das & Das (2007) There is fluctuation in the foreign exchange rate and this is due to the news and fundamental and is found to be non-linear. Dudin et al, (2014), For a stable economy, we need good industrial production. For micro and macro-economic relationship the industrial production is very important. If the industrial production gets affected then the whole economy gets affected. The development of country is not possible under the negative influence. The industrial production must have strategic financial management for the growth of economy (Dudin et al, 2014). Increase in the industrial production index will increase national income of the country. There is an equilibrium relationship in a long run between industrial production and economic growth. Chandra (20212) FII has more liquidity compared to FDI. Institutional investors undertake FII. Performance of stock markets determines the FII (Chakrabarti, 2001). FII greatly affects the stock market. The trading volumes determine how well stock market of a country performs. The causality is bidirectional between FII and stock market. Foreign institutions closely monitor the market performance and make investments accordingly. Patel et al, (2015).The data of stock price is nonlinear, uncertain and not regularized. In stock market predicting the stock price is very difficult or complex (Cho et al, 2021). Stock prices are difficult to predict due to their volatility. Investors mostly use fundamental analysis and technical analysis. In technical we cannot find intrinsic value of share but the trends can be identified

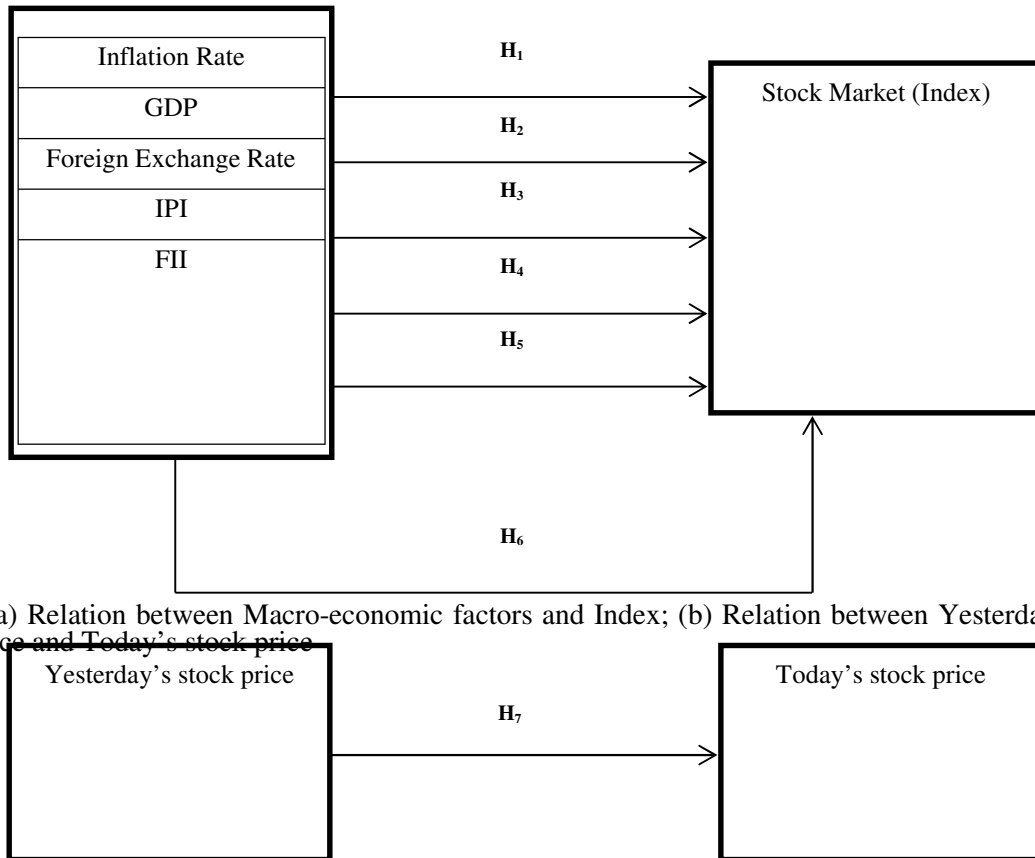


Fig. 1. (a) Relation between Macro-economic factors and Index; (b) Relation between Yesterday's stock price and Today's stock price

Hypothesis

- H1 – There is a relationship between inflation rate and stock index.
- H2 – There is a relationship between GDP and stock index.
- H3 – There is a relationship between Foreign Exchange Rate and stock index.
- H4 – There is a relationship between IPI and stock index.
- H5 – There is a relationship between FII and stock index.
- H6 – There is a relationship between macro-economic factors and stock index.
- H7 – There is a relationship between today’s stock price and yesterday’s stock price

Research Methodology

Conclusive research design is used in the research. Secondary data is used for the research purpose. The macro-economic factors data is taken from RBI and the stock price data is collected from NSE (National Stock Exchange). The macro-economic factors data is cross-sectional data taken year wise. The stock price data is the longitudinal data as historical prices are considered for the stock price prediction. In our research we have used both longitudinal and cross-sectional data. Hence, we can conclude that panel data can be used.

Statistical Methods used

Pearson Correlation, Regression, Multiple Regression & Univariate Time Series (ARIMA model) are the methods used.

Correlation Equation

$$Y = a + b X \tag{1}$$

Where,

X → Independent Variable

Y → Dependent Variable

a → Constant

Multiple Regression Equation

$$Y_i = a + \beta_1 X_i + E_i \tag{2}$$

Where,

Y = Dependent Variable

a = Constant

β_i = Beta

X_i = Independent Variable

E_i = Random or residual error

Regression Formula

$$Y = a + bX + e \tag{3}$$

Where,

Y → Dependent Variable

X → Independent Variable

a → Constant

b → Slope

e → Residual error

Analysis and Interpretation:-

Table 1.1 Company analysis of selected companies

Sector	Bank				
Company Name	HDFC	SBI	ICICI	AXIS	KOTAK
Mean	1017.52	281.37	373.88	577.16	1252.44
Variance	88958.51	4719.78	19130.14	14488.51	145780.7
Standard Deviation	298.26	68.7	138.31	120.37	381.81
β (2016 – 2021)	0.120	0.379	1.465	1.080	1.030
Return	22.23%	18.86%	26.53%	12.15%	22.37%
Sector	FMCG				
Company Name	HUL	ITC	Nestle	Britannia	Marico
Mean	1632.05	244.56	11291.76	2672.73	342.64
Variance	318056.7	1476.07	20702767	648997.4	5312.41
Standard Deviation	563.97	38.42	4550.03	805.6	72.89
β (2016 – 2021)	0.598	0.772	0.081	0.278	0.508
Return	23.17%	5.23%	23.84%	19.90%	18.72%
Sector	IT				
Company Name	TCS	Infosys	HCL	Redington	Tech Mahindra
Mean	1942.54	769.29	575.98	125.97	680.75
Variance	508254	108456	46951.8	2032.14	54167.6
Standard Deviation	712.92	329.33	216.68	45.08	232.74
β (2016 – 2021)	0.086	0.747	0.092	0.610	0.802
Return	21.85%	25.75%	21.91%	15.43%	25.05%
Sector	Real Estate				
Company Name	DLF Ltd	Prestige Estates Project	Indiabulls Real Estate Ltd	Brigade Enterprises Ltd	Oberoi Realty Ltd
Mean	192.46	251.29	110.12	174.73	450.85
Variance	3815.6	4167.59	3196.83	4502.98	16568.2
Standard Deviation	61.77	64.56	56.54	67.1	128.72
β (2016 – 2021)	0.553	0.128	0.688	0.821	0.232
Return	32.10%	23.19%	45.02%	38.78%	24.18%
Sector	Electronics				
Company Name	MIRC Electronic s Ltd	Dixon Technolog ies	BPL	Orient Electric	Videocon
Mean	18.5	1461.09	44.47	202.06	32.25

Variance	144.56	1970983	725.37	4222.36	1882.72
Standard Deviation	12.02	1403.92	26.93	64.98	43.39
β (2016 – 2021)	0.458	0.124	0.224	0.066	0.026
Return	50.21%	70.77%	54.37%	16.42%	-14.93%

Mean, variance, standard deviation and β of 25 companies are calculated to find the best company for investment. The β (Beta) denotes the risk and return we can expect from each company stocks. Top 5 companies from top 5 sectors are chosen to analyse the investment benefits. The sectors included are Bank, FMCG, IT, Real Estate and Electronics. Considering the sector bank five companies HDFC, SBI, ICICI, AXIS and Kotak are taken. Analysing the β of these companies HDFC has the lowest volatility of return compared to the market ($\beta = 0.120$) whereas ICICI bank has the highest volatility of return compared to the market ($\beta = 1.465$). In FMCG sector we can infer from β value that Nestle has lowest volatility of return compared to the market ($\beta = 0.081$) where ITC has the highest volatility of return compared to the market ($\beta = 0.772$). In IT sector TCS has the lowest volatility of return compared to the market ($\beta = 0.086$) and Tech Mahindra has the highest volatility of return compared to the market ($\beta = 0.802$). In Real Estate sector Prestige Estates project ($\beta = 0.128$) has lowest volatility of return compared to the market and Brigade Enterprises Ltd ($\beta = 0.821$) has the highest volatility of return compared to the market. In electronics sector Videocon has the lowest volatility of return compared to the market ($\beta = 0.026$) and MIRC Electronics has the highest volatility of return compared to the market ($\beta = 0.458$). From overall company analysis we can find that Videocon has the lowest volatility of return compared to the market ($\beta = 0.026$) and ICICI bank has the highest volatility of return compared to the market ($\beta = 1.465$). When standard deviation is considered in the bank sector KOTAK has the highest SD = 381.81, the price range varies greatly with the average value and SBI has the lowest SD = 68.7 so the price does vary greatly from the average price. In FMCG Nestle has highest SD = 4550.03, so the stock price varies greatly compared to average price and ITC has the lowest SD = 38.42. In IT sector the TCS has highest SD = 712.92 and Redington has lowest SD = 45.08. Under Real Estate sector Oberoi Realty Ltd has highest SD of 128.72 and Indiabulls Real Estate Ltd has lowest SD of 56.54. In electronics sector Dixon Technologies has the highest SD of 1403.92 whereas the MIRC electronics have lowest SD of 12.02. From overall company analysis the Nestle has highest SD of 4550.03, so the price variation is high compared to the average price. MIRC Electronics has the lowest SD of 12.02; the price variation is very less compared to the average price. From the above analysis Nestle is the riskiest stock and MIRC is less risky. Returns are important while investing in stocks. In Bank sector ICICI gives the highest return of 26.53% and AXIS bank gives the lowest return of 12.15%. In FMCG sector Nestle gives highest return of 23.84% and ITC gives the lowest return of 5.23%. In IT sector Infosys gives highest return of 25.75% and Redington gives the lowest return of 15.43%. In Real Estate sector Indiabulls Real Estate Ltd has the highest return of 45.02% and Prestige Estates Project has the lowest return of 23.19%. Under Electronics sector Dixon Technologies gives highest return of 70.77% and Videocon gives less return of -14.93%. From overall company analysis Dixon Technologies gives highest return of 70.77% and Videocon gives less return of -14.93%.

4.2 SEM Model for Macro-economic factors and Stock Market relation



Figure 1.1 SEM Model

Multiple Regression Equation

Stock Market (Nifty 50) =
 $a + (0.93 * GDP) + (0.93 * Inflation\ Rate) + (0.93 * Forex\ USD) + (0.93 * Forex\ Pound\ Sterling) + (0.93 * Forex\ Japanese\ Yen) + (0.93 * Forex\ Euro) + (0.93 * IPI) + (0.93 * FII) + 0.141$
 (4)

Path Coefficient (Beta)

Table 2.1 Path Coefficient

Variables	Macro-economic Factors	Stock Market
Macro-economic Factors	-	-
Stock Market	0.930	-

The Beta value between the Stock Market and Macro-economic factor is 0.930. For every 1% change in macro-economic factors the stock market moves by 0.930.

P Value

Table 2.2 P Value

Variables	Macro-economic Factors	Stock Market
Macro-economic Factors	-	-
Stock Market	<0.001	-

The P value between the Stock Market and Macro-economic factor is <0.001. Hence the overall hypothesis (H6) is accepted. There is a significant relationship between macro-economic factors and stock market.

Correlation among latent variable with square root of Average Variance Extracted (AVE)

Table 2.3 Correlation among latent variable with square root of AVE

Variables	Macro-economic Factors	Stock Market
Macro-economic Factors	(0.791)	0.888
Stock Market	0.888	(1.000)

The r value is 0.888. The r^2 value is 0.788544. It is the coefficient of correlation.

P values for correlations

Table 2.4 P values for correlations

Variables	Macro-economic Factors	Stock Market
Macro-economic Factors	1.000	<0.001

Stock Market	<0.001	1.000
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P value is less than 0.001 and hence the hypothesis (H6) is accepted.

Latent Variable Coefficients

Table 2.5 Latent Variable Coefficients

	Macro-economic factors	Stock Market
R-Squared	-	0.866
Adjusted R-Squared	-	0.851
Full Collin. VIF	4.712	4.712
Q-Squared	-	0.862
Min	-1.734	-1.369
Max	1.238	1.828
Median	0.168	-0.152
Mode	-1.734	-1.369
Skewness	-0.336	0.428
Exc. Kurtosis	-1.162	-0.907

Multivariate Relationship Graph

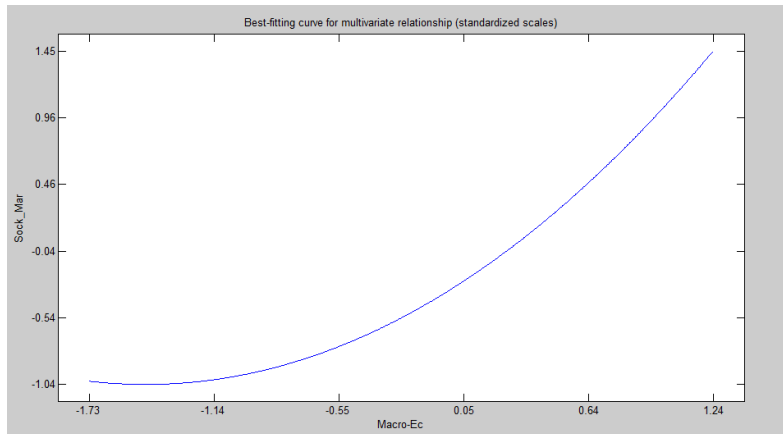


Figure 4.2.2 Multivariate Relationship Graph

From the graph we can infer that as the macro-economic factors effect increases then the stock market index also increases exponentially. We can infer that the macro-economic factor influences stock market.

4.3 Individual relationship between variables using SPSS

Bivariate correlation between Macro-economic Factors & Stock Market (NIFTY 50)

Table 3.1 Bivariate correlation between Macro-economic Factors & Stock Market

Correlation		GDP
Nifty 50 closing	Pearson correlation	0.913
	Sig. (2 - tailed)	.000

	N	11
Correlation		Inflation Rate
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	-0.682 .021 11
Correlation		Forex (Euro)
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	0.751 .008 11
Correlation		Forex (Japanese Yen)
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	0.701 .016 11
Correlation		Forex (Pound Sterling)
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	0.918 .000 11
Correlation		Forex (USD)
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	0.918 .000 11
Correlation		IPI
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	-0.704 .016 11
Correlation		FII
Nifty 50 closing	Pearson correlation Sig. (2 - tailed) N	-0.029 .932 11

From the Pearson correlation table GDP, Forex (Euro), Forex (Japanese Yen), Forex (Pound Sterling), Forex (USD) have strong positive relationship with stock market index. Inflation rate, IPI and FII have negative correlation with the stock market index.

Correlation

$$\text{Nifty 50} = a + (0.913 * \text{GDP}) \quad (1)$$

$$\text{Nifty 50} = a + (-0.682 * \text{Inflation Rate}) \quad (2)$$

$$\text{Nifty 50} = a + (0.751 * \text{Forex (Euro)}) \quad (3)$$

$$\text{Nifty 50} = a + (0.701 * \text{Forex (Japanese Yen)}) \quad (4)$$

$$\text{Nifty 50} = a + (0.918 * \text{Forex (Pound Sterling)}) \quad (5)$$

$$\text{Nifty 50} = a + (0.918 * \text{Forex (USD)}) \quad (6)$$

$$\text{Nifty 50} = a + (-0.704 * \text{IPI}) \quad (7)$$

$$\text{Nifty 50} = a + (-0.029 * \text{FII}) \quad (8)$$

Regression

Model Summary (Inflation)

Table 4.1 Model Summary (Inflation)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.68	0.46	0.41	0.02

ANOVA (Inflation)

Table 5.1 ANOVA (Inflation)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	.00	1	.00	7.81	0.021
Residual	.00	9	.00		
Total	.01	10			

Coefficients (Inflation)

Table 5.2 Coefficients (Inflation)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	0.13	0.02	0.00	5.64	.000
Nifty 50	0.00	0.00	-0.68	-2.80	.021

The R² is 0.46 which is positive and the significant value is 0.021. The alternate hypothesis (H1) is proved i.e. there is a relationship between Inflation and stock market.

Model Summary (GDP)

Table 5.3 Model Summary (GDP)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.91	0.83	0.82	181.83

ANOVA (GDP)

Table 5.4 ANOVA (GDP)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	1497125	1	1497125	45.28	.000
Residual	297570.8	9	33063.42		
Total	1794696	10			

Coefficients (GDP)

Table 5.6 Coefficients (GDP)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	1082.95	178.25	0.00	6.08	.000
Nifty 50	0.13	0.02	0.91	6.73	.000

The R² of GDP is 0.83, and the significant value is .000. The alternate hypothesis (H2) is accepted. There is a significant relationship between GDP and Stock Market.

Model Summary (Forex USD)

Table 5.7 Model Summary (Forex USD)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.92	0.84	0.83	4.13

ANOVA (Forex USD)

Table 5.8 ANOVA (Forex USD)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	828.94	1	828.94	48.50	.000
Residual	153.82	9	17.09		
Total	982.76	10			

Coefficients (Forex USD)

Table 5.9 Coefficients (Forex USD)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	33.03	4.05	.00	8.15	.000
Nifty 50	.00	.00	.92	6.96	.000

The R² value is 0.84 and the significant value is .000. The alternate hypothesis (H3) is proved i.e. there is a significant relationship between Forex Exchange (USD) and Stock Market.

Model Summary (Forex Pound Sterling)

Table 5.10 Model Summary (Forex Pound Sterling)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.57	.32	.25	8.71

ANOVA (Forex Pound Sterling)

Table 5.11 ANOVA (Forex Pound Sterling)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	322.40	1	322.40	4.25	.069
Residual	682.00	9	75.78		
Total	1004.39	10			

Coefficients (Forex Pound Sterling)

Table 5.12 Coefficients (Forex Pound Sterling)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	69.45	8.53	.00	8.14	.000
Nifty 50	.00	.00	.57	2.06	.069

The R² value is 0.32 and the significant value is .069. The alternate hypothesis (H3) is rejected i.e. there is no significant relationship between Forex Exchange (Pound Sterling) and Stock Market.

Model Summary (Forex Japanese Yen)

Table 5.13 Model Summary (Forex Japanese Yen)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.70	.49	.44	4.31

ANOVA (Forex Japanese Yen)

Table 5.14 ANOVA (Forex Japanese Yen)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	161.67	1	161.67	8.71	.016
Residual	167.00	9	18.56		
Total	328.66	10			

Coefficients (Forex Japanese Yen)

Table 5.15 ANOVA (Forex Japanese Yen)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	46.71	4.22	.00	11.06	.000
Nifty 50	.00	.00	.70	2.95	.016

The R² value is 0.49 and the significant value is .016. The alternate hypothesis (H3) is proved i.e. there is a significant relationship between Forex Exchange (Japanese Yen) and Stock Market.

Model Summary (Forex Euro)

Table 5.16 Model Summary (Forex Euro)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.75	.56	.52	5.40

ANOVA (Forex Euro)

Table 5.17 ANOVA (Forex Euro)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	339.45	1	339.45	11.65	.008
Residual	262.20	9	29.13		
Total	601.65	10			

Coefficients (Forex Euro)

Table 5.18 Coefficients (Forex Euro)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	55.32	5.29	.00	10.45	.000
Nifty 50	.00	.00	.75	3.41	.008

The R^2 value is 0.56 and the significant value is .008. The alternate hypothesis (H3) is proved i.e. there is a significant relationship between Forex Exchange (Euro) and Stock Market.

Model Summary (IPI)

Table 5.19 Model Summary (IPI)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.70	.50	.44	18.53

ANOVA (IPI)

Table 5.20 ANOVA (IPI)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	3043.17	1	3043.17	8.86	.016
Residual	3089.80	9	343.31		
Total	6132.97	10			

Coefficients (IPI)

Table 5.21 Coefficients (IPI)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		

Constant	200.49	18.16	0.00	11.04	.000
Nifty 50	-0.01	0.00	-0.70	-2.98	.016

The R² value is 0.50 and the significant value is .016. The alternate hypothesis (H4) is proved i.e. there is a significant relationship between IPI (Industrial Production Index) and Stock Market.

Model Summary (FII)

Table 5.22 Model Summary (FII)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.03	.00	-.11	105564.0

ANOVA (FII)

Table 5.23 ANOVA (FII)

	Sum of squares	Df	Mean Square	F	Sig.
Regression	85715569	1	85715569	.01	.932
Residual	1.0E+011	9	1.1E+010		
Total	1.0E+011	10			

Coefficients (FII)

Table 5.24 Coefficients (FII)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	108611.8	103481.7	.00	1.05	.319
Nifty 50	-1.00	11.41	-0.03	-0.09	.932

The R² value is 0.00 and the significant value is .932. The alternate hypothesis (H5) is rejected i.e. there is no significant relationship between FII (Foreign Institutional Investors) and Stock Market.

The Regression equation

$$\text{Nifty 50} = 0.13 + (-0.68 * \text{Inflation Rate}) + 0.02 \quad (1)$$

$$\text{Nifty 50} = 1082.95 + (0.91 * \text{GDP}) + 178.25 \quad (2)$$

$$\text{Nifty 50} = 33.03 + (0.92 * \text{Forex USD}) + 4.05 \quad (3)$$

$$\text{Nifty 50} = 69.45 + (0.57 * \text{Forex Pound Sterling}) + 8.53 \quad (4)$$

$$\text{Nifty 50} = 46.71 + (0.70 * \text{Forex Japanese Yen}) + 4.22 \quad (5)$$

$$\text{Nifty 50} = 55.32 + (0.75 * \text{Forex Euro}) + 5.29 \quad (6)$$

$$\text{Nifty 50} = 200.49 + (-0.70 * \text{IPI}) + 18.16 \quad (7)$$

$$\text{Nifty 50} = 108611.8 + (-0.03 * \text{FII}) + 103481.7 \quad (8)$$

Stock Price Prediction

Stock prices of Selected companies under five different sectors are taken. The prices are predicted using ARIMA model.

Table 6.1 Today's price of SBI influences yesterday's price from 2016 to 2021

	Coefficient	Std. Error	Z	p-value
Const	317.343	67.5337	4.699	2.61e-06 ***
phi_1	0.997955	0.00184384	541.2	0.0000 ***
theta_1	0.0139454	0.0263377	0.5295	0.5965

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0020	0.0000	1.0020	0.0000
MA	Root 1	-71.7080	0.0000	71.7080	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's SBI stock price and yesterday's SBI stock price. We can predict future stock price of SBI based on this interpretation.

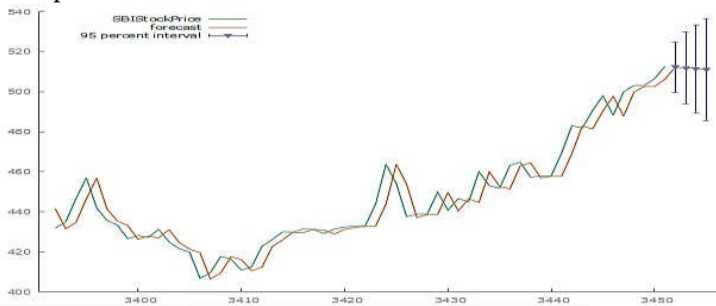


Figure 2.1 The graph represents the stock price of SBI form 2017 to 2022 and its forecast

Table 6.2 Today's price of ICICI influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	487.841	216.593	2.252	0.0243 **
phi_1	0.999434	0.000687044	1455	0.0000 ***
theta_1	-0.0212306	0.0269402	-0.7881	0.4307

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0006	0.0000	1.0006	0.0000

MA	Root 1	47.1018	0.0000	47.1018	0.0000
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From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's ICICI stock price and yesterday's ICICI stock price. We can predict future stock price of ICICI based on this interpretation.

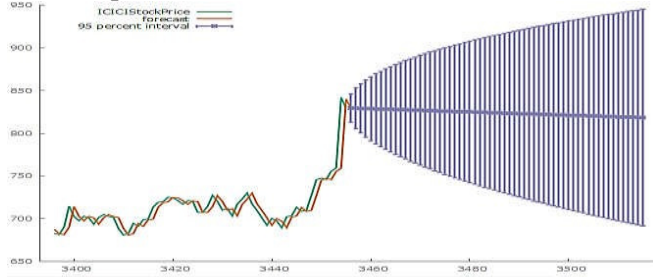


Figure 2.2 The graph represents the stock price of ICICI from 2017-2022.

Table 6.3 Today's price of AXIS influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	590.635	64.6705	9.133	6.66e-020 ***
phi_1	0.995474	0.00255647	389.4	0.0000 ***
theta_1	0.0761669	0.0283039	2.691	0.0071 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0045	0.0000	1.0045	0.0000
MA	Root 1	-13.1291	0.0000	13.1291	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's AXIS stock price and yesterday's AXIS stock price. We can predict future stock price of AXIS based on this interpretation.

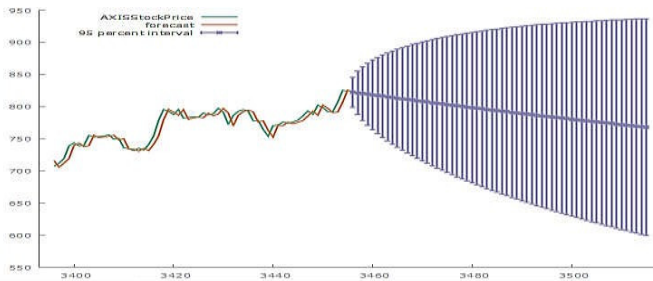


Figure 2.3 The graph represents the stock price of AXIS for 6 years 2017 to 2022 and its forecast

Table 6.4 Today's price of Kotak influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	1391.20	478.761	2.906	0.0037 ***

phi_1	0.999230	0.000891609	1121	0.0000 ***
theta_1	-0.0238191	0.0270510	-0.8805	0.3786

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0008	0.0000	1.0008	0.0000
MA	Root 1	41.9831	0.0000	41.9831	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Kotak stock price and yesterday's Kotak stock price. We can predict future stock price of Kotak based on this interpretation.

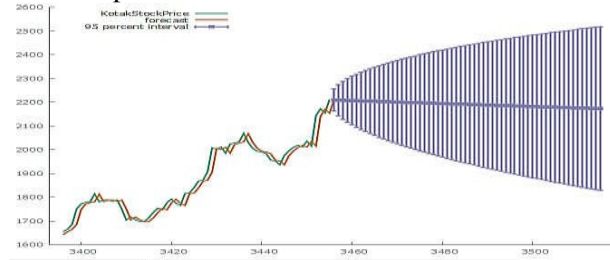


Figure 2.4 The graph represents the stock price of Kotak for 6 years 2017 to 2022 and its forecast

Table 6.5 Today's price of HDFC influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	1070.27	356.273	3.004	0.0027 ***
phi_1	0.999248	0.000870397	1148	0.0000 ***
theta_1	0.0645269	0.0282926	2.281	0.0226 **

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0008	0.0000	1.0008	0.0000
MA	Root 1	-15.4974	0.0000	15.4974	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's HDFC stock price and yesterday's HDFC stock price. We can predict future stock price of HDFC based on this interpretation.

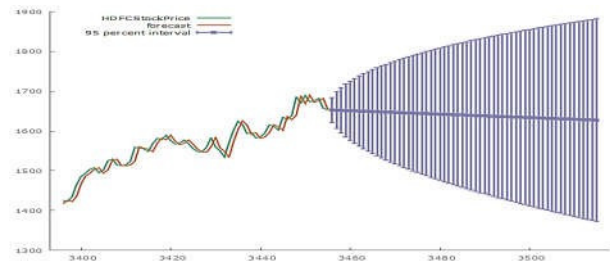


Figure 2.5 The graph represents the stock price of HDFC form 2017 to 2022.

Table 2.6 Today's price of HUL influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	1642.90	575.028	2.857	0.0043 ***
phi_1	0.999375	0.000701137	1425	0.0000 ***
theta_1	-0.0769321	0.0274390	-2.804	0.0051 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0006	0.0000	1.0006	0.0000
MA	Root 1	12.9985	0.0000	12.9985	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's HUL stock price and yesterday's HUL stock price. We can predict future stock price of HUL based on this interpretation.

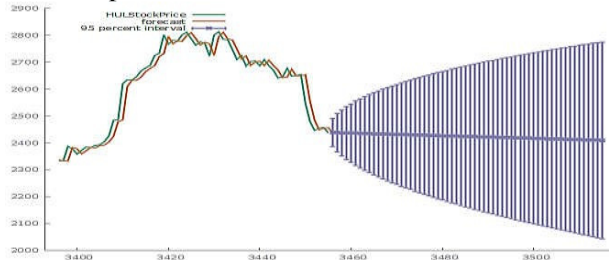


Figure 2.6 The graph represents the stock price of HUL form 2017 to 2022.

Table 6.7 Today's price of ITC influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	241.293	16.2068	14.89	3.92e-050 ***
phi_1	0.994185	0.00260003	382.4	0.0000 ***
theta_1	0.00250048	0.0273237	0.09151	0.9271

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0058	0.0000	1.0058	0.0000
MA	Root 1	-399.9228	0.0000	399.9228	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's ITC stock price and yesterday's ITC stock price. We can predict future stock price of ITC based on this interpretation.

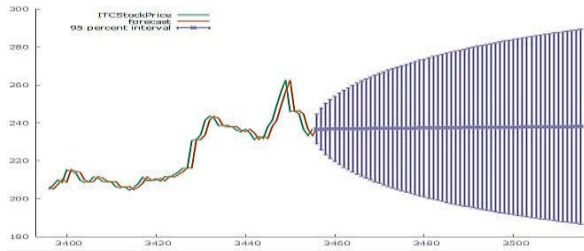


Figure 2.7 The graph represents the stock price of ITC form 2017 to 2022.

Table 6. 8 Today’s price of Nestle influences yesterday’s price from 2017 to 2022.

	Coefficient	Std. Error	Z		p-value
Const	12194.8	5230.44	2.332		0.0197 **
phi_1	0.999562	0.000529229	1889		0.0000 ***
theta_1	-0.0722646	0.0285483	-2.531		0.0114 **

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0004	0.0000	1.0004	0.0000
MA	Root 1	13.8380	0.0000	13.8380	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today’s Nestle stock price and yesterday’s Nestle stock price. We can predict future stock price of Nestle based on this interpretation.

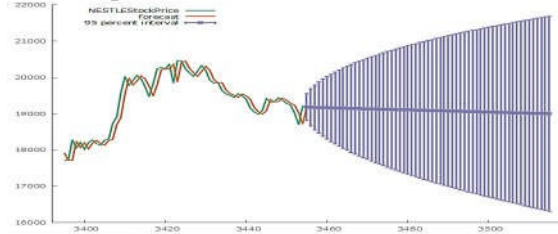


Figure 2.8 The graph represents the stock price of Nestle form 2017 to 2022.

Table 6.9 Today’s price of Britannia influences yesterday’s price from 2017 to 2022.

	Coefficient	Std. Error	Z		p-value
Const	2626.90	709.267	3.704		0.0002 ***
phi_1	0.998969	0.00100848	990.6		0.0000 ****
theta_1	-0.00486113	0.0259442	-0.1874		0.8514

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0010	0.0000	1.0010	0.0000
MA	Root 1	205.7133	0.0000	205.7133	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Britannia stock price and yesterday's Britannia stock price. We can predict future stock price of Britannia based on this interpretation.

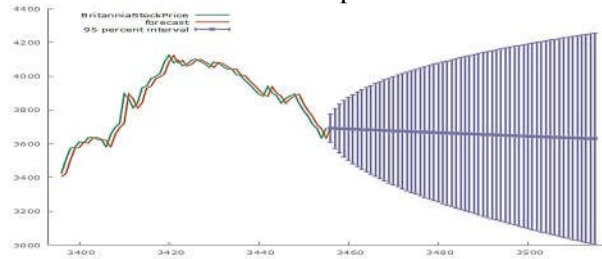


Figure 2.9 The graph represents the stock price of Britannia form 2017 to 2022 and its forecast

Table 6.10 Today's price of Marico influences yesterday's price from 2016 to 2021

	Coefficient	Std. Error	Z	p-value
Const	377.865	110.254	3.427	0.0006 ***
phi_1	0.999329	0.000824177	1212	0.0000 ***
theta_1	-0.0729245	0.0281043	-2.595	0.0095 ***

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0007	0.0000	1.0007	0.0000
MA	Root 1	13.7128	0.0000	13.7128	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Marico stock price and yesterday's Marico stock price. We can predict future stock price of Marico based on this interpretation.

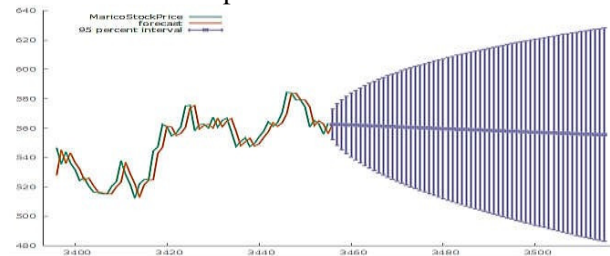


Figure 2.10 The graph represents the stock price of Marico form 2017 to 2022.

Table 6.11 Today's price of TCS influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	2240.79	870.822	2.573	0.0101 **
phi_1	0.999513	0.000584461	1710	0.0000 ***
theta_1	-0.0393266	0.0273160	-1.440	0.1500

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0005	0.0000	1.0005	0.0000
MA	Root 1	25.4281	0.0000	25.4281	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's TCS stock price and yesterday's TCS stock price. We can predict future stock price of TCS based on this interpretation.

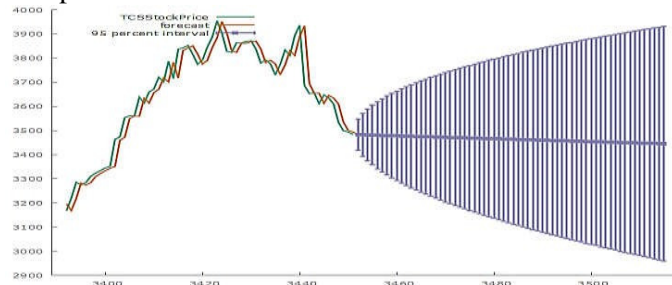


Figure 2.11 The graph represents the stock price of TCS form 2017 to 2022.

Table 6.12 Today's price of Infosys influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	1061.59	491.683	2.159	0.0308 **
phi_1	0.999681	0.000399535	2502	0.0000 ***
theta_1	0.00996177	0.0268736	0.3707	0.7109

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0003	0.0000	1.0003	0.0000
MA	Root 1	-100.3838	0.0000	100.3838	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Infosys stock price and yesterday's Infosys stock price. We can predict future stock price of Infosys based on this interpretation.

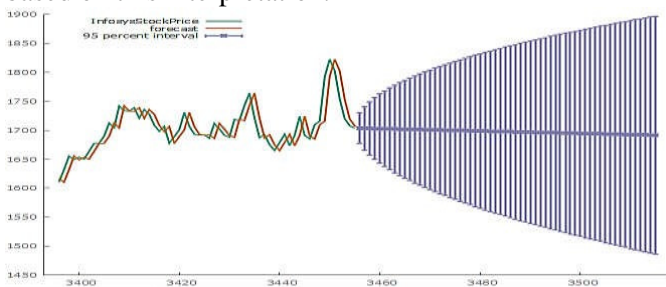


Figure 2.12 The graph represents the stock price of Infosys for 6 years 2017 to 2022 and its forecast

Table 6.13 Today's price of HCL influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	736.024	291.873	2.522	0.0117 **
phi_1	0.999494	0.000599958	1666	0.0000 ***
theta_1	-0.00958613	0.0291150	-0.3293	0.7420

		Real	Imaginary	Modulus	Frequency
AR	Root1	1.0005	0.0000	1.0005	0.0000
MA	Root 1	104.3147	0.0000	104.3174	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's HCL stock price and yesterday's HCL stock price. We can predict future stock price of HCL based on this interpretation.

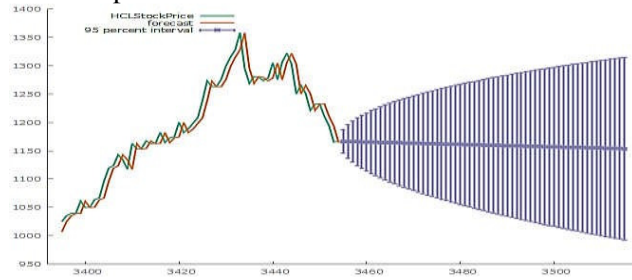


Figure 2.13 The graph represents the stock price of HCL form 2017 to 2022 and its forecast

Table 4.5.14 Today's price of Redington influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	127.245	15.3266	8.302	1.02e-016 ***
phi_1	0.990066	0.00352213	281.1	0.0000 ***
theta_1	0.0475505	0.0253671	1.874	0.0609 *

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0100	0.0000	1.0100	0.0000
MA	Root 1	-21.0303	0.0000	21.0303	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Redington stock price and yesterday's Redington stock price. We can predict future stock price of Redington based on this interpretation.



Figure 2.14 The graph represents the stock price of Redington form 2017 to 2022.

Table 6.15 Today’s price of Tech Mahindra influences yesterday’s price from 2016 to 2021

	Coefficient	Std. Error	Z	p-value
Const	959.930	422.788	2.270	0.0232 **
phi_1	0.999590	0.000508929	1964	0.0000 ***
theta_1	-0.000426953	0.0281257	-0.01518	0.9879

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0004	0.0000	1.0004	0.0000
MA	Root 1	2342.1756	0.0000	2342.1756	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today’s Tech Mahindra stock price and yesterday’s Tech Mahindra stock price. We can predict future stock price of Tech Mahindra based on this interpretation.

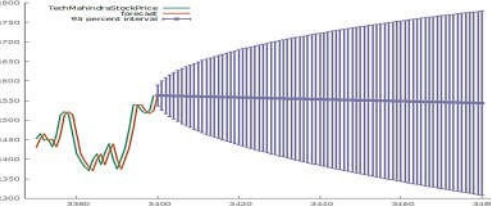


Figure 2.15 The graph represents the stock price of Tech Mahindra form 2017 to 2022.

Table 6.16 Today’s price of DLF Ltd influences yesterday’s price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	2851.50	0	0	0
phi_1	0.999998	0	0	0
theta_1	-0.0230017	0	0	0

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0000	0.0000	1.0000	0.0000
MA	Root 1	43.4751	0.0000	43.4751	0.0000

From the above table we can infer that the P value is 0 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today’s DLF Ltd stock price and yesterday’s DLF Ltd stock price. We can predict future stock price of DLF Ltd

based on this interpretation.

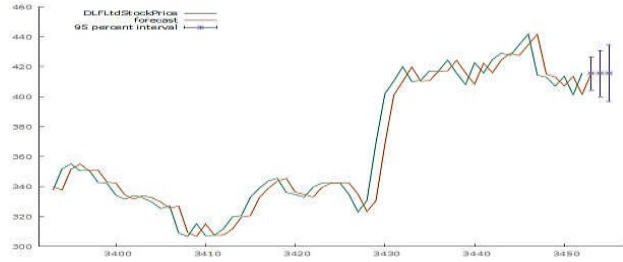


Figure 2.16 The graph represents the stock price of DLF Ltd for 6 years 2017 to 2022.

Table 6.17 Today's price of Prestige Estate Projects influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	265.664	36.7175	7.235	4.64e-013 ***
phi_1	0.994985	0.00291280	341.6	0.0000 ***
theta_1	-0.0334775	0.0258354	-1.296	0.1950

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0050	0.0000	1.0050	0.0000
MA	Root 1	29.8708	0.0000	29.8708	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Prestige Estate Projects stock price and yesterday's Prestige Estate Projects stock price. We can predict future stock price of Prestige Estate Projects based on this interpretation.

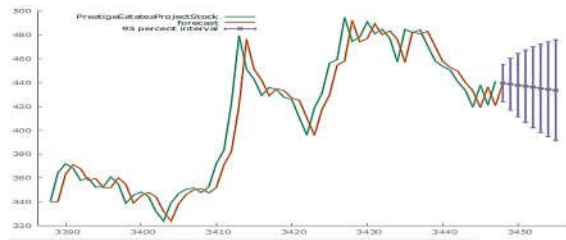


Figure 2.17 The graph represents the stock price of Prestige Estate Projects from 2017 to 2022

Table 6.18 Today's price of Indiabulls Real Estate Ltd influences yesterday's price from 2016 to 2021

	Coefficient	Std. Error	Z	p-value
Const	110.202	28.9678	3.804	0.0001 ***
phi_1	0.996368	0.00202127	492.9	0.0000 ***
theta_1	0.0484186	0.0259923	1.863	0.0625 *

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0036	0.0000	1.0036	0.0000
MA	Root 1	-20.6532	0.0000	20.6532	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Indiabulls Real Estate Ltd stock price and yesterday's Indiabulls Real Estate Ltd stock price. We can predict future stock price of Indiabulls Real Estate Ltd based on this interpretation.

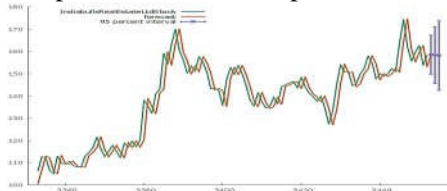


Figure 2.18 The graph represents the stock price of Indiabulls Real Estate Ltd form 2017 to 2022
Table 6.19 Today's price of Brigade Enterprises Ltd influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	-1.17066	9.42206	-0.1242	0.9011
phi_1	0.999885	0.000157857	6334	0.0000 ***
theta_1	-0.00165979	0.0249833	-0.06644	0.9470

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0001	0.0000	1.0001	0.0000
MA	Root 1	602.4852	0.0000	602.4852	0.0000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Brigade Enterprises Ltd stock price and yesterday's Brigade Enterprises Ltd stock price. We can predict future stock price of Brigade Enterprises Ltd based on this interpretation.

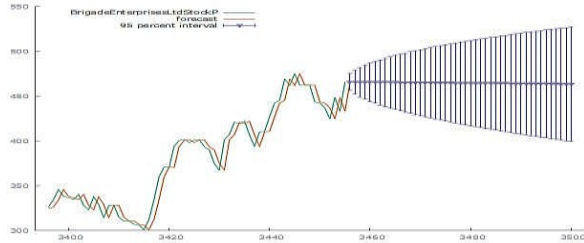


Figure 2.19 The graph represents the stock price of Brigade Enterprises Ltd form 2017 to 2022.
Table 6.20 Today's price of Oberoi Realty Ltd influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	517.447	147.782	3.50	0.0005 ***
phi_1	0.998126	0.00186890	534.1	0.0000 ***
theta_1	0.0319536	0.0273222	1.170	0.2422

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0019	0.0000	1.0019	0.0000
MA	Root 1	-31.2954	0.0000	31.2954	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Oberoi Realty Ltd stock price and yesterday's Oberoi Realty Ltd stock price. We can predict future stock price of Oberoi Realty Ltd based on this interpretation.

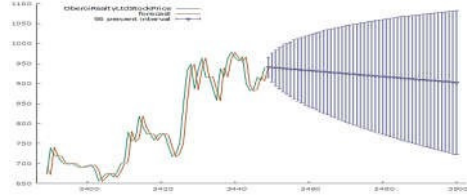


Figure 2.20 The graph represents the stock price of Oberoi Realty Ltd form 2017 to 2022.

Table 6.21 Today's price of MIRC Electronics Ltd influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	19.0622	5.71755	3.334	0.0009 ***
phi_1	0.996141	0.00199690	498.8	0.0000 ***
theta_1	0.0927824	0.0258666	3.587	0.0003 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0039	0.0000	1.0039	0.0000
MA	Root 1	-10.7779	0.0000	10.7779	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's MIRC Electronics Ltd stock price and yesterday's MIRC Electronics Ltd stock price. We can predict future stock price of MIRC Electronics Ltd based on this interpretation.

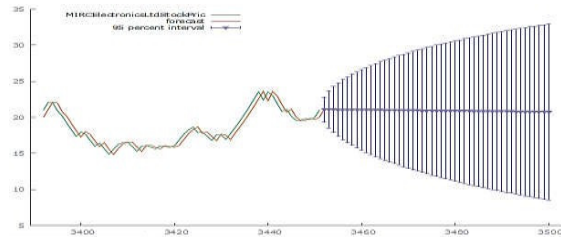


Figure 2.21 The graph represents the stock price of MIRC Electronics Ltd form 2017 to 2022.

Table 6.22 Today's price of Dixon Technologies influences yesterday's price from 2016 to 2021

	Coefficient	Std. Error	Z	p-value
Const	2616.70	1977.03	1.324	0.1857
phi_1	0.999598	0.000506119	1975	0.0000 ***
theta_1	0.193474	0.0343551	5.632	1.79e-08 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0004	0.0000	1.0004	0.0000
MA	Root 1	-5.1687	0.0000	5.1687	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Dixon Technologies stock price and yesterday's Dixon Technologies stock price. We can predict future stock price of Dixon Technologies based on this interpretation.

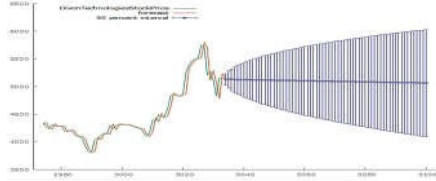


Figure 2.22 The graph represents the stock price of Dixon Technologies from 2017 to 2022.

Table 6.23 Today's price of BPL influences yesterday's price from 2017 to 2022

	Coefficient	Std. Error	Z	p-value
Const	52.8119	16.7715	3.149	0.0016 ***
phi_1	0.996582	0.00217557	458.1	0.0000 ***
theta_1	0.220636	0.0249495	8.843	9.29e-019 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0034	0.0000	1.0034	0.0000
MA	Root 1	-4.5323	0.0000	4.5323	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's BPL stock price and yesterday's BPL stock price. We can predict future stock price of BPL based on this interpretation.

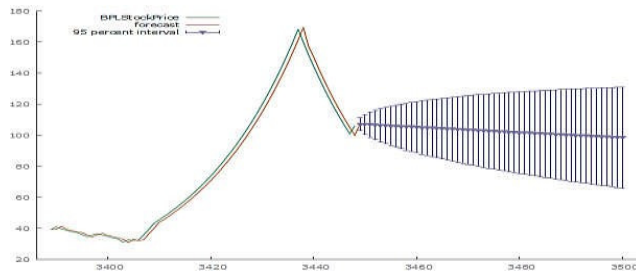


Figure 2.23 The graph represents the stock price of BPL form 2017 to 2022.

Table 6.24 Today's price of Orient Electric influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	221.733	59.2790	3.740	0.0002 ***
phi_1	0.997827	0.00206526	483.1	0.0000 ***
theta_1	0.0419912	0.0342068	1.228	0.2196

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0022	0.0000	1.0022	0.0000
MA	Root 1	-23.8145	0.0000	23.8145	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Orient Electric stock price and yesterday's Orient Electric stock price. We can predict future stock price of Orient Electric based on this interpretation.

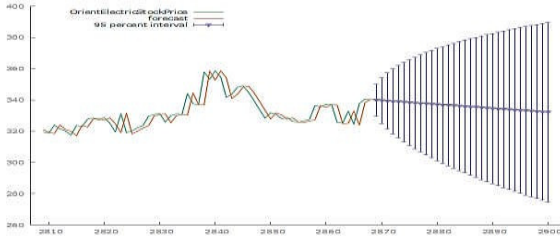


Figure 2.24 The graph represents the stock price of Orient Electric form 2017 to 2022.

Table 6.25 Today's price of Videocon influences yesterday's price from 2017 to 2022.

	Coefficient	Std. Error	Z	p-value
Const	60.9694	53.8422	1.132	0.2575
phi_1	0.999808	0.000246619	4054	0.0000 ***
theta_1	0.526286	0.0200262	26.28	3.25e-152 ***

		Real	Imaginary	Modulus	Frequency
AR	Root 1	1.0002	0.0000	1.0002	0.0000
MA	Root 1	-1.9001	0.0000	1.9001	0.5000

From the above table we can infer that the P value is 0.0000 which is less than 5% of significance. The alternate hypothesis (H7) is accepted. There is a significant relationship between today's Videocon stock price and yesterday's Videocon stock price. We can predict future stock price of Videocon based on this interpretation.

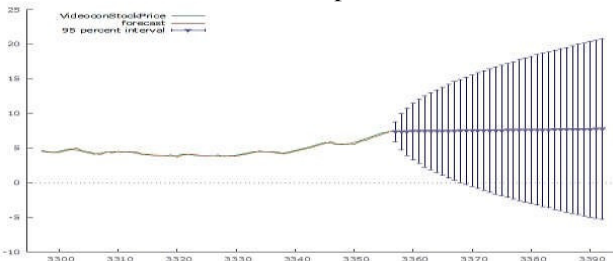


Figure 2.25 The graph represents the stock price of Videocon form 2017 to 2022.

Table 6.26 Entry and Exit point table

Company Name	Highest Price	Target Price	Lowest Price
HDFC	1890	1630	1380

SBI	530	510	485
ICICI	945	820	690
AXIS	940	765	590
KOTAK	948	770	600
HUL	2700	2485	2020
ITC	285	238	185
Nestle	21500	19000	16100
Britannia	4250	3650	3000
Marico	625	555	482
TCS	3905	3450	2920
Infosys	1870	1690	1495
HCL	1310	1492	985
Redington	172.32	148.50	125.28
Tech Mahindra	1775	1535	1305
DLF Ltd	432	418	398
Prestige Estates Project	478	432	385
Indiabulls Real Estate Ltd	175	155	142
Brigade Enterprises Ltd	520	460	398
Oberoi Realty Ltd	1080	900	718
MIRC Electronics Ltd	33.5	22	7.2
Dixon Technologies	6000	5110	4148
BPL	130	92	70
Orient Electric	390	332	272
Videocon	20	7	0

From the above table we can find the entry and exit point for every company under different sectors. At the lowest price we can buy the stocks and at the highest price we can exit if the stock price is overvalued. The above table shows the price band of 25 companies under five sectors.

Findings and Implications

- The macroeconomic factor has a significant relationship with the stock market (Nifty 50 Index). The reason for the relationship between macro-economic factors and index is that macro-economic factors affect the economy of the country. The stock market depends on the economy growth. If the economic growth is high then stock market will have increased stock values. If the economic growth is low then stock market will have decreased stock values.
- GDP, Forex (Euro), Forex (Japanese Yen), Forex (Pound Sterling), Forex (USD) have strong positive relationship with stock market index. Inflation rate, IPI and FII have negative correlation with the stock market index. The correlation indicates that macro-economic factors GDP, Forex (Euro), Forex (Japanese Yen), Forex (Pound Sterling), Forex (USD) affects the index. The negative correlation indicates inverse relationship. The price of the stocks decreases if the inflation increases and vice versa. This is due the sentiment of investors. They feel that if

inflation increases market price of stock might drop. The IPI is important as it affects the sentiment of the investors. But in our research we get inverse relationship between IPI and index because IPI contributes less when compared to service sectors. When FII increases (bought) the price of the stock increases when the FII decreases (sold) decreases. From analysis inverse relationship is seen.

- In overall company analysis, Dixon Technologies gives highest return of 70.77% and Videocon gives less return of -14.93%. Videocon has the lowest volatility of return compared to the market as the beta value is less compared to other companies and ICICI bank has the highest volatility of return compared to the market as the company's beta value is higher than the other company's beta value.

- Nestle is the riskiest stock from analysis. The risk is interpreted from standard deviation. Nestle had the highest standard deviation compared to other companies under different sectors. Another major reason is the volatility of Nestle stocks due to its liabilities. Earnings of Nestle continue to decrease and this pose threat because liabilities cannot be managed if this situation persists and there exists concerns over EBIT growth. MIRC is less risky due to the smallest standard deviation value from the analysis and it has its EBIT growth.

- When 25 company's stock prices are predicted using ARIMA model we get a price band. With the help of the price band the entry and exit level can be decided by the short term investor by analysing the highest and lowest price predicted by the ARIMA model. The company analysis and prediction help short term investors to gain from the market.

Scope for further study

From our research results it is evident that macro-economic factors play an important role in the stock market trend. IPI (Industrial Production Index) affects stock market as IPI has significant relationship with the stock market. Other factors like GDP, Inflation Rate, Forex, FII affects stock market. This helps the long term investors to invest their money considering the macro-economic factors. For short term investors ARIMA model is used to predict the stock prices of top five companies under top 5 sectors. This helps to find the price band through which we can find the entry point and the exit point. Thus by understanding the effect of macro-economic factors, long term investors can have profits and by predicting stock prices the short term investors can gain by trading. In this research we did not consider the technical oscillator for stock price prediction. Hence, in future, if the researcher consider the other factors that would be more useful for the investors for them investment in the stock market.

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