ANALYSIS OF FACTOR EFFECTING STOCK MARKET PRICE IN INDIA

[1]Vasanti Todakar, [2]Vanjare Rushikesh

[1]Assistant Professor, [2]Research Scholer
[1]Department of Statistics, PTVA's Sathaye College, Vileparle Mumbai, India,
[2]Department of Statistics, PTVA's Sathaye College, Vileparle Mumbai, India

Abstract : This research is studying the relationship between various economic variable such as inflation, foreign & domestic investment data, Interest rate, gold price, oil price, exchange rate, GDP and the stock market price (Nifty 50) using multiple regression model. The data is collected from the time period of 2018-2021 on Quarterly basis. The methodology is among the about variable at least one of the variables is correlated to the stock market price. For all the analysis statistical programming language R -software is use. The study conclude that Interest rate , inflation and oil price are showing correlation with the stock market price of India.

IndexTerms - **Commerce, Stock market, Finance, Regression, B.S.E., N.S.E, etc.**

I. INTRODUCTION

Stock market is an organized financial market where brokers and traders buy and sell stocks, bonds and securities. It is an interconnected system which delivers conditions appropriate to exchange securities, convert real assets into financial assets in order to raise funds from the market. Thus it has multiple purposes to serve. Thus it facilitates capital expansion by companies via selling shares, channelizing savings, and increasing companies' profits.

Considering Indian stock market, it is one the oldest in Asia. There are two stock exchanges in India i.e. National Stock Exchange (N.S.E.) and Bombay Stock Exchange (B.S.E.). National Stock exchanges incorporated 1992 and Bombay Stock exchange in 1875. Major trading is done in NSE and thus it is in the leading position. Paper studies the relationship between different factors determining the stock prices in Indian Stock market. A Multiple regression with independent variables as Inflation, Repo rate, foreign Institutional investor data ,domestic institutional investors data, Oil prices, Exchange rates, Gold prices and Gross domestic product (GDP) and stock prices as dependent variable is run in order to validate if these variables are statistically significant in explaining the behaviour of stock prices in Indian market or not.

II. OBJECTIVE:

• To show the relation between major financial term or indices are affecting the stock market of India or not.

Methodology:

Hypothesis: To test whether as Inflation, Repo rate, foreign Institutional investor data ,domestic institutional investors data, Oil prices, Exchange rates, Gold prices and Gross domestic product (GDP) can explain changes in Stock prices or not i.e.

H0: Repo Rate(Interest rate) = FII = DII = Inflation Data = GDP = Exchange rate= Oil prices = Gold Prices = 0

H1: Atleast one of the variables ≠ 0

Data on variables has been collected from RBI, SEBI and NSE India for the period 2018-2021 on quarterly basis. A multiple linear regression is run where dependent variable is stock price (Nifty50 Index) and independent variables are Inflation, Repo rate (Interest rates giving by RBI), foreign Institutional investor data ,domestic institutional investors data, Gross domestic product (GDP) Exchange rate (₹/$), Oil Prices($/Barrel) and Gold Prices(₹ /Gram).

Initial regression model is as follows :

$$\text{Stock prices} = \beta 0 + \beta 1 \text{ Repo rate} + \beta 2 \text{ FII} + \beta 3 \text{ DII} + \beta 4 \text{ Inflation} + \beta 5 \text{ GDP} + \beta 6 \text{ Exchange rate} + \beta 7 \text{ Gold prices} + \beta 8 \text{ oil price} + \varepsilon i$$

The main purpose of the study is to test whether the variables that are found significant in the literature, also holds true for Indian Stock Marketer not i.e. if there exists a causal relationship between dependent and independent variables or not?

About Multiple linear regression (MLR):

Multiple linear regression (MLR), also known simply as multiple regression, is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. The goal of multiple linear regression is to model the linear relationship between the explanatory (independent) variables and response (dependent) variables. In essence, multiple regression is the extension of ordinary least-squares (OLS) regression because it involves more than one explanatory variable.

About the regression variables:

Nifty movement:

It is the key indices of the major stock exchange of India which is national stock exchange(nse). The nifty 50 contains all top fifty companies of India which have higher market capitalization. The index is showing the average movement of this fifty companies. And reflecting overall growth of the companies as well as the growth of the country.

The nifty movement is our y variable or dependent variable for this regression analysis. We want to define the nifty movement using other variables.

Foreign institutional investor:

A foreign institutional investor (fii) is an investor or investment fund investing in a country outside of the one which it is registered can include hedge funds, insurance companies ,pension funds, investment bank and mutual fund. Fiis can be important sources of capital in developing economies, yet many developing nation such as India.

Exchange rate:

An exchange rates is a rate at which one currency will be exchanged for another currency and affects trade and the movement of money between countries.

Exchange rates are impacted by both the domestic currency value and the foreign currency value. Most exchange rates are defined as floating and will rise or fall based on the supply and demand in the market.

Exchange rate changes affect businesses by changing the cost of supplies that vary purchased from a different country, and by changing the demand for their products from overseas customers.

Gold prices:

Changing in the gold prices and stock market return have major relation theoretically. Usually, it is said that in the financial markets the money flows from stock to gold in any kind of panic situations. Hence the show inverse relationship between them and we want to prove that?

Oil prices :

Oil is also plays and important role in the economy. The rise in prices can affect the transportation cost for any goods and supplies . And lead to increase in the product value and disrupt the supply demand cycle.

Gross domestic product (GDP)

Gross domestic product (GDP) is the standard measure of the value added created through the production of goods and services in a country during a certain period. As such, it also measures the income earned from that production, or the total amount spent on final goods and services (less imports). While GDP is the single most important indicator to capture economic activity, it falls short of providing a suitable measure of people's material well-being for which alternative indicators may be more appropriate. This indicator is based on nominal GDP (also called GDP at current prices or GDP in value) and is available in different measures: US dollars and US dollars per capita (current PPPs). All OECD countries compile their data according to the 2008 System of National Accounts (SNA). This indicator is less suited for comparisons over time, as developments are not only caused by real growth, but also by changes in prices and PPPs.

Inflation:

Inflation is a rise in prices, which can be translated as the decline of purchasing power over time. The rate at which purchasing power drops can be reflected in the average price increase of a basket of selected goods and services over some period of time. The rise in prices, which is often expressed as a percentage, means that a

unit of currency effectively buys less than it did in prior periods. Inflation can be contrasted with deflation, which occurs when prices decline and purchasing power increases.

While it is easy to measure the price changes of individual products over time, human needs extend beyond just one or two products. Individuals need a big and diversified set of products as well as a host of services for living a comfortable life. They include commodities like food grains, metal, fuel, utilities like electricity and transportation, and services like health care, entertainment, and labor.

Inflation aims to measure the overall impact of price changes for a diversified set of products and services. It allows for a single value representation of the increase in the price level of goods and services in an economy over a period of time.

Repo Rate:

The repo rate is the interest rate at which the Reserve Bank of India (RBI) loans money to commercial banks. Repo is an abbreviation for

Repurchase Agreement or Repurchasing Option. Banks obtain loans from the Reserve Bank of India (RBI) by selling qualifying securities.

The central bank or RBI and the commercial bank would reach an agreement to repurchase the securities at a set price. When banks are short on funds or need to maintain liquidity under volatile market conditions, this is done. The repo rate is utilized by the RBI to manage inflation

As previously stated, the repo rate is utilized by the Indian central bank to restrict the flow of money in the market. When the market is impacted by inflation, the RBI raises the repo rate.

An increased repo rate means that banks borrowing money from the central bank during this period will have to pay more interest. This inhibits banks from borrowing money, reducing the amount of money in the market and helping to negate inflation. In the event of a recession, repo rates are also reduced.

Procedure :

R software codes :

```
> library(readxl)
> model=read_excel("C:/Users/SNEHA/OneDrive/Desktop/book3.xlsx")
> View(model)
> y=model$y
> x1=model$X1
> x2=model$X2
> x3=model$X3
> x4=model$X4
> x5=model$X5
> x6=model$X6
> x7=model$X7
> x8=model$x8
> model1=lm(y~x1+x2+x3+x4+x5+x6+x7+x8)
> summary(model1)
Call:
lm(formula = y ~ x1 + x2 + x3 + x4 + x5 + x6 + x7 + x8)
Residuals:
```

```
   Min    1Q  Median    3Q    Max
-808.24 -316.15  -57.76  234.74 1050.23
```

Coefficients:

```
          Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.356e+04  9.507e+03   3.530  0.00960 **
x1          -1.647e+03  6.737e+02  -2.445  0.04446 *
x2          -1.752e-02  2.854e-02  -0.614  0.55867
x3          -1.081e-02  2.276e-02  -0.475  0.64932
x4           4.912e+01  3.443e+01   1.427  0.19675
x5          -8.674e+02  2.668e+02  -3.251  0.01404 *
x6          -1.303e+02  1.636e+02  -0.796  0.45196
x7          -2.851e+00  2.480e+00  -1.149  0.28812
x8           8.742e+01  1.706e+01   5.125  0.00136 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Residual standard error: 755.3 on 7 degrees of freedom
Multiple R-squared: 0.962,   Adjusted R-squared: 0.9187
F-statistic: 22.17 on 8 and 7 DF, p-value: 0.0002612

For checking Homoscedasticity and normality :
```
library(zoo)
library(lmtest)
bptest(model1)
shapiro.test(y)
studentized Breusch-Pagan test
data:  model1
BP = 9.9904, df = 8, p-value = 0.2657
> shapiro.test(y)
Shapiro-Wilk normality test
data:  y
W = 0.89291, p-value = 0.06194
```

For checking multicollinearity

```
library(mctest)
imcdiag(model1,method = "VIF")
```

VIF Multicollinearity Diagnostics

```
    VIF  detection
x1 12.3109      1
x2 37.7995      1
x3 39.4281      1
x4  2.3257      0
x5  3.5235      0
x6  6.1450      0
x7  9.8571      0
x8  1.9193      0
```

Multicollinearity may be due to x1 x2 x3 regressors

```
1 --> COLLINEARITY is detected by the test
0 --> COLLINEARITY is not detected by the test
model2=cbind(x1,x2,x3,x4,x5,x6,x7,x8)
library(matrix)
```

```
library(glmnet)
cv.glmnet(model2,y)

ridgemodel=cv.glmnet(model2,y)
library(mass)
finalridge=lm.ridge(y~x1+x2+x3+x4+x5+x6+x7+x8,lambda=ridgemodel$lamda.min)
summary(finalridge)
coef(finalridge)
```
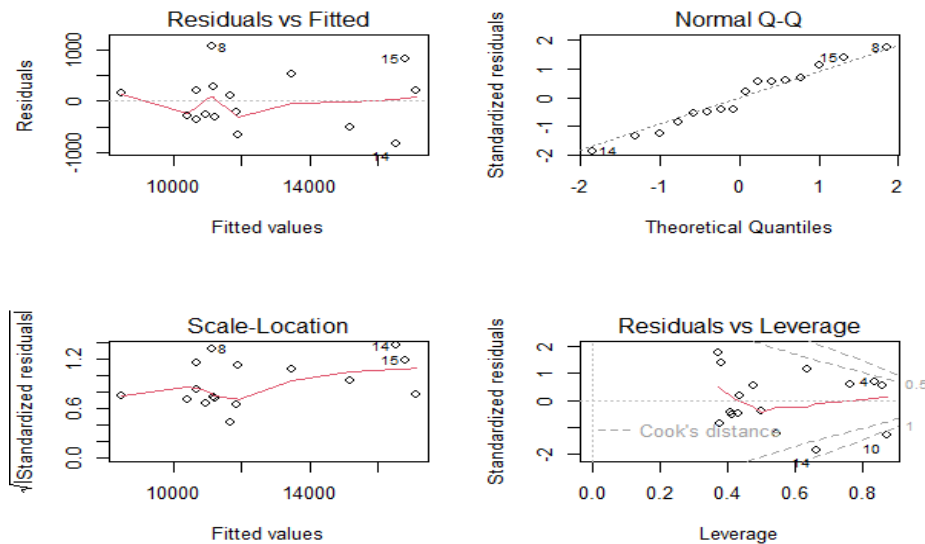

Conclusion :

We established that Repo Rate (Interest rate), Oil Prices and Inflation do have an effect over stock prices in India. Another interesting result that we observe is that gold price does not have any significant impact over the stock prices. Similar results have been found out in other literatures too. Finally, we reject the null hypothesis of all variables do not affect stock prices and can accept the alternate hypothesis i.e. there are some variables present in the model that do affect the stock prices in India

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