Effects of Exchange Rate and Inflation Rate on Stock Market Returns Volatility in India.

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Research

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Title Page

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Abstract

The paper investigates the effect of exchange and inflation rate on stock market returns in India. The study uses monthly, quarterly and annual inflation and exchange rate data obtained from the RBI and market returns computed from the Indian share market index from January, 2000 to June, 2020.The paper uses the autoregressive distributed lag (ARDL) co-integration technique and the error correction parametization of the ARDL model for investigating the effect on Indian Stock markets. The GARCH and its corresponding Error Correction Model (ECM) were used to explore the long- and short-run relationship between the India Stock market returns, inflation, and exchange rate. The paper shows that there exists a long term relationship but there is no short-run relationship between Indian market returns and inflation. But, there is periodicity of inflation monthly considerable long run and short-run relationship between them existed. The outcome also illustrates a significant short-run relationship between NSE market returns and exchange rate. The variables were tested for short run and it was significantly shown the positive effects on the stock market returns and making it a desirable attribute of which investors can take advantage of. This is due to the establishment of long-run effect of inflation and exchange rate on stock market returns.

Keyword: returns, exchange rate, inflation, ARDL and GARCH

Introduction

The formation of the Indian Stock Exchange (NSE) and Bombay stock exchange (BSE) was part of the recommendations of the economic development reforms carried out in the 1994s and 1875s to create a sustainable economic growth and development. The economic upheaval caused due to the spread of the covid19 over the past few months has adversely affected various segments of the Indian economy, According to RBI report (2016) the GDP growth rate is day by day down falling due to high inflation rate and negative impact on exchange rate when

compare with the USD. In this connection, the exchange rate of the rupee can also be an apt marker on the state of the Indian economy's competitiveness.Fundamentally, an exchange rate in comparison with another exchange rate reflects the relative demand among the holders for the two currencies. This demand, in turn, depends on the relative demand for the goods and services of the two countries. If the US dollar is stronger than the rupee, then it shows that the demand for dollars is more than the demand in Indian Currency. The paper also examines the outlook of the inflation rate during covid19 and the effects of inflation rates on the Indian stock market volatility. Inflation as measured by the consumer price index (CPI) breached the higher acceptance band of the target in December 2019 and fatigued in January 2020, before outgoing prices of essential produced a downward shift of 100 bps inFebruary, 2020. The curve of inflation in the near-term is possible to be accustomed by the pace of U-turn of the spike in essential items prices, the scattering of inflationary pressures across other food prices, the frequency of one-off cost-push effects on various elements of core inflation and in particular, the development of the COVID-19 outbreak. Before covid19, the inflation rate was under control and in March 2020, the RBI conducted a survey to determine the inflation rate level in essential items and other essential things. The number of respondents expecting the general price level to increase by more than the current rate declined for both three months and one year ahead horizons vis-à-vis January 2020. In liter way the study also discussed about behavior aspect of the consummation of goods and viability of goods and services, and the inflation expectations of households and firms can shape future inflation through price and wage setting behavior.

This research paper assesses the continuation of high stock market returns volatility in India, and the effects of the exchange rate, and inflation on Indian stock market returns. The disproportionate volatility hinders the stock marketin fulfilling its role of mobilizing financial resources from available additional resources units to shortfall units and may cause a financial crisis in India. Stock market volatility is currently very high due to the outbreak of covid19 in India. The paper finds that inflation rate has a negative relationship with stock market returns, while exchange rate has a positive association with stock market returns, The paper also highlights the important points consequently is, there is high and persistent volatility in the Indian stock market returns. The paper finds that inflation rate and exchange rate impact volatility of Indian stock market returns considerably.

According A. **Boateng**, after his investigations with involvement in the economy activities, an accord emerged that the accomplishment of a dynamic

economic enlargement required a larger role for the private sector and stock markets. This consistently earnings that the growth and sustainability of the stockmarket and nation economic developments are significance to the government, institutions, and individual investors.

Majority of stakeholders invest in stocks markets with the aim of maximizing the profit on their investment. Though, these kinds of decisions are made without considering into account the effect that macroeconomic variables such as exchange rate and inflation can have on the stock prices of the listed companies in market. According to **B. M. Tabak (year)** the stock market has an important role to play in the economic development of a country. He points out that stock markets acts as the platform for mobilizing domestic and international level resources for dynamic investments plan. Additionally also discuss that the assessment of the stock market outcomes shown that the significant relationship with the economic development activity. Inflation continuing process of rising level of estimation the general price, is possible a general concern to any government. **Ibrahim and Agbaje**,(year)find that inflation rate rises in spite of rigid policies put into effect by the government to control the inflation rates. They alsodiscussabout other factors such as income, nominal wage rate for labour, variance in revenue generation and the payment of loanswhich can have hugeeffects on inflation in an economy.

An experimental understanding of this association will help as an appropriate decision-making tool for policy makers and other users in the stock market. Investor's usuallyagreethat macroeconomic actions have a huge impact on the volatility of stock prices **(Gant, 2006).** Macroeconomic assessment can be customary for the stakeholder to estimate the assessment of the stock market **(Talla, 2013);** the economic development variables has been shown negative impact on development of GDP growth in short run and positive shown on the long run period**,** same as on the stock market returns from the investor behavior point of view**(Kumar, 2013)** according to **Fisher (1930) has illustrated in his research study** that the nominal stock returns are a hedge against inflation, in this connection, when it rise in present and future inflation should rise the expected nominal dividend payments also increased. Further, another paper illustrates about inflation and expected returns from the stock market. Gordon **(1959)** finds that the discount rate must be calculated by the rate of return that investor expects to gain as dividend or capital yield on stock market. A rise in inflation expectations and actual inflation rate must also raise expected cash flow of nominal dividend

payment from stocks in the future. **Dritsakis** explain the existence of a long-run association between demand for money, inflation, real income, and exchange rate and also reveals that the flexibility of real income was affirmative, while that of inflation and exchange rate was pessimistic. **Tian and Ma** discussthe use of cointegration ARDL approach to determine the relationship between exchange rate and the Chinese share market. They find that exchange rate and money supply influence stock market positively. **Qiao** explored the relationship between stock prices of Tokyo, Hong Kong, and Singapore and exchange rate and finds the continuation of a long-run relation between exchange rate and stock prices for three nation markets. **Ozlen and Ergun** investigated the relationship between stock returns and the macroeconomic variables with help of the autoregressive distributed lag (ARDL) methodology. They find the existence of long-run relationships between the variables, which was positive. **Adjasi et al.** examined the repercussions of exchange rate volatility on the stock market, using data for the period from 1995 to 2005. Using GARCH, they find that there existed a negative relationship between exchange rate and the stock market returns.

Data and Methodology

Data Collection and Source: the research paper is based on the secondary data. Information is collected from the RBI, for the period of January 30, 2020 to June 10, 2020 consisting of daily and monthly observations for each macro-economic variable. The Stock prices were sourced from the NSE and BSE.

Explanation and Transformation of Data: With help of the ARDL methodology, the paper usesstock market returns, exchange rate, and inflation. To find market returns for NSE NIFTY 50and BSE Sensex30 indices, we use the formula $\boldsymbol{R_i = (P_i - P_{i-1})/P_i \times 100}$, where P_i is the stock price at time i and $Pi-1$ is the stock price at time $i - 1$. However, for inflation and exchange rates, the study uses the actual values obtained from the RBI. Before using the statistical methods, each variable was checked for stationarity, by using the Augmented Dickey-Fuller (ADF) test. Any variable of this study that is not stationary is differenced using the formula $\boldsymbol{\Delta Y_t = Y_t - Y_{t-1}}$**.** All non-stationary dataset variables are differenced until they became stationary.

Unit Root Test: this method is used for the macroeconomic time series data to determine the non-stationary, the time series data stationary if the mean and variance values are constant during selected period, the research paper used this

method to calculate the value of the covariance, the time period depended on the gap between the period and not actual time periods with comparison this covariance. The stationarity of a time series data variable can be examined using the ADF test, PP test or KPSS test, which can be applied as anequivalent of ADF and PP tests. In this paper, the time series data used for the Indian stock market returns, exchange rate, and inflation. In this study apply the ARDL methodology, the first performthe unit root test on the time series variables in the paper to createrelationship among the time series variables whether the variables are stationary or not. For this paper, the Augmented Dickey-Fuller (ADF) unit root test hasused for the determine the value. In the function of the ADF test, three regression forms are generated:

$$\Delta Y_t = \alpha_1 Y_{t-1} + \sum_{j-i}^{p} Y_t \Delta Y_{t-j} + \varepsilon_t$$

$$\Delta Y_t = \alpha_0 + \alpha_t Y_{t-i} + \sum_{p-j}^{p} \gamma_j \Delta \gamma_{j-i} + \varepsilon_1 \quad \text{----------(1)}$$

ARDL model to Co-integration. In determination the ARDL model, the best lag length *(p)* is preferred by using the Prediction Error (PE) criterion, Akaike Information Criterion (AIC), while ensuring that the errors are white sound. After the assessment of the appropriate lag length, the ARDL model can then be specified andpredictable. Underneath is anexplanation of the ARDL model in both the simple and generalized forms.

A simple ARDL Model: $y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t$,---------- (2)

From the above equation, the coefficients are interpreted as the long-run effects on the stock market. In an ARDL model, both the dependent and independent variables have a lagof one. In long-runsymmetry, the paper expects that $y_t = y_{t-1}$ and $x_t = x_{t-1}$. Based on equation no 2, the paper has drawn the following formula
$y_t = \alpha_0 + \alpha_1 y_t + \beta_0 x_t + \beta_1 x$

$(1 - \alpha_1)\, y_t = \alpha_0 + (\beta_0 + \beta_1)\, x.$ ----------(3)

From the equation no 2 and 3 the study has frame the relationship between the macro economic variables for the long-run reaction to y of an alteration in x is illustrated by the following equation to determine the significance impact on the stock market returns.

$$K = \frac{\beta_0 + \beta_1}{1 - \alpha_a}. \text{ ----------(4)}$$

From equation no 4, the paper built the relationship between the ARDL method and the error correction model (ECM), deduct y_{t-1} from the equation (2) the value has derived $\beta_0 x_{t-1}$. This value has show the impact on the stock market returns.

$$y_t - y_{t-1} = \alpha_0 + (\alpha_{1-1})\, y_{t-1} + \beta_0\, (x_t - x_{t-1}) + (\beta_0 + \beta_1)\, x_{t-1} + \varepsilon_t. \text{ ----------(5)}$$

From equation no 5, the value has derived the $_0 + \beta_1 = (1 - \alpha_1)$, and also indicated value is substitutes with the $\Delta y = y_t - y_{t-1}$ *and* $\Delta x = x_t - x_{t-1}$ the outcome the values is based on the above equation, with help of the above substitute values the study has framed the equation no 6 the following

$$\Delta y_t = \alpha_0 + (\alpha_{1-1})\, (y_{t-1} - k x_{t-1}) + \beta_0 \Delta x_{t-1} + \varepsilon t \text{ ----------(6)}$$

GARCH Model Specification

Bollerslev et al., (1994) explained about the GARCH and ARCH methods which are the most important instruments for measuring volatility dynamics in the stock market. The GARCH method makes present conditional variance dependent on lags of its preceding variance. One of the disadvantages of this method is that it enforces symmetric results of volatility to both positive and negative volatility in stock market returns in particularly Indian context.

$$\sigma_t^2 = w + \alpha_1 \varepsilon_{t-1}^2 + \beta_2 \sigma^2_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Based on equation no 7,we can infer that variance is a function of variables with an error term. $\sigma_t^2$is a certain time period forward of forecast variance based on precedent information. Indicates that is a constant term; ε_{t-1}^2, that values of w it is determined the volatility from the previous period measured as a lag of squared residual from the mean equation. σ^2_{t-1} is the forecast variance.

Besides, by accumulation the lagged ε_t^2symbol indicated to both sides of the equation and affectingσ_t^2 to model can be rewritten as a process for the squared errors:

$$\varepsilon_t^2 = \alpha_0 + (\alpha_1 + \beta_1) \cdot \varepsilon_{t-1}^2 + v_t - \beta_1 \cdot v_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Where$v_t = \varepsilon_t^2 - \sigma_t^2$.

From the equation 8 has illustrated the significant effects on the stock values so the determination of the paper has indicated in this research study and the paper has been used the historic time series data sets to analyzed the existence of volatility clustering between the stock market returns. Normality in the data was evaluated by stationary using the Augmented Dickey Fuller (ADF) test.

Empirical analysis and discussions

The information used for the research paper consistsofmonthly inflation rate, daily and monthly exchange rate of Indian Currency and stock market returns. The research paper started with an analysis and discussion of the stationarity of the variables, viz., exchange rate, market returns and inflation. After that. The paper has followed the ARDL, GARCH model and error correction model (ECM).This model has been used for the assessment of the short run and long run relationship between the selected variables.

Table 1:Augmented Dickey-Fuller (ADF) unit root test for the Indian Stock market, exchange rate and inflation (monthly data has taken for this calculation).

Variables	Method type	Test	Critical value	Significance level (p value)
Stock market returns	Constant	-0.410	-0.730	0.320
	Constant + trend	-1.573	-1.492	0.253
	Non	-0.941	2.538	0.426
Inflation rate	Constant	1.639	-0.495	0.638
	Constant + trend	-0.381	-1.730	0.052
	Non	1.462	-2.749	0.206
Exchange rate (INR)	Constant	-5.720	-2.859	0.005
	Constant + trend	-5.620	-1.603	0.031
	Non	-5.371	-2.592	0.002

The table no 1 has explain the paper can confirm the existence of stationarity among the macroeconomic variables, The p value of the stock market, inflation rate and exchange rate constant level it was more than 0.05, it mean, the values it has indicates significance values are negatively effect on the overall development of the stakeholder returns due to this the paper has frame the model to evaluate the results of the ADF test to determine or test the hypothesis what is effects are there on each variables of macroeconomic indicators; hence, if the paper

accepted the null hypothesis of unit root at 5% level of significance and based on the Table no 1 outcomes and also based on the above all equation and tables outcomes the study has drawn the conclusion that the return rates are stationary certain period from January 2000 to June 2020.The outcome of the ADF test is disclosed the values in Table no 1. This means that the return rates of the Indian Stock market has integrated of order zero (I(0)) since stock market returns arestationary without differencing.

Table 2: ADF unit root test for the inflation rateand exchange rate (Indian Rupees) **after first difference** (monthly data has taken for this calculation).

Variables	Method type	Test	Critical value	Significance level (p value)
Inflation rate	Constant	-3.502	-3.381	0.005
	Constant + trend	-3.062	-1.582	0.003
	Non	-3.271	-0.451	0.001
Exchange rate (Indian Rupees)	Constant	-2.721	-2.382	0.001
	Constant + trend	-1.538	-3.692	0.002
	Non	-0.581	-1.835	0.005

Table no 2 illustratesthe results of the ADF test of stationarity for inflation and exchange rate in Indian Stock markets, after applying first difference. The p values indicated that the both variables are not stationary. To determine the significance level, the paper usesordinary differencing test. Hence, based on this test, the inflation and the INR (Indian Currency) rate values were differenced. In view of the fact, that the p values from Table no 2 are each less than 0.05, we conclude that the variables are stationary, i.e., after first difference, inflation and exchange rate became stationary. This meansthat inflation rate and exchange rate are both integrated oforder one I (1).The ARDL test according to Pesaran has explained that can be used for co-integration investigationin connection of the regressors are merely$I(0)$, and $I(1)$, or a both combination of this two equation$I(0)$ and $I(1)$. The outcome from the table 2 indicatesthat the stock market returns are integrated of order with above mention equation no $I(0)$ and inflation and exchange rate are every integrated of order one $I(1)$.

Table no-3: The ARDL method to test the existence relationship of the Market returns, exchange rate and inflation rate.

Number of regressors	Value of statistic, $K = 2$
Computed F-statistic 0.05 level critical value	3.962

Lower value	2.461
Upper value	3.629

The ARDL model used for the determination of stock market returns against the exchange rate and inflation rate. The outcome of the table no 3, illustrates the predictable of the ADRL method exploring the association between NSE and BSE returns, exchange rate and inflation rate. The study examinesthe relationship between the short and long run effects on the stock market returns in India. The outcome of the ARDL test for co-integrationamong theNSE and BSE market returns, inflation, and exchange rate is obtainable in Table no 3. From the above table, the determined F-statistic is 3.962. This value is above the upper critical value of 3.629 at the 50.05 significance level. The null hypothesis of co-integrating affiliation can be rejected according to Pesaran. This suggeststhatIndian stock market returns are co-integrated with inflation and exchange rate. The outcome alsoindicatesthat there exists a long-run association between the variables.

Table-4: Predictable long-run coefficients of ARDL selected by Schwarz Bayesian Criterion.

Regressor	Coefficient	Standard error	*T*-Ratio	P value
Exchange rate	0.073	0.364	1.604	0.064
INR	-0.284	0.073	-2.083	0.003
Constant	0.693	0.027	2.056	0.001

Table-5: Error correction illustration of the chosen ARDL model selected by Schwarz Bayesian Criterion.

Regressor	Coefficient	Standard error	*T*-Ratio	P value
d (Exchange rate)	0.0492	0.0527	2.6902	0.005
d (inflation rate)	-0.0638	0.7362	-1.0694	0.476
ECM (-1)	-0.3751	0.0682	-1.9730	0.025

The paper calculates the estimates of the ARDL values in long run coefficient for the method and that ECM also. Table no 4 obtains the result of long run estimated values after applying the ADRL and ECM methods, while the table t also obtained the estimated values of the ECM. The long run coefficients and ECM estimated are also indicated in the table no 4 and 5 in sequence order of (0,1,1), that means the dependent variable is Indian stock market has a lag 0, while each of the independent variables, viz., exchange rate and inflation rate have a log of 1.

The outcome of the long-run relationship among the Indian market returns, exchange rate, and inflation in table no 5 exploresthat the coefficient of inflation and exchange rate have an affirmative and negative impact on stock returns in India, correspondingly, the values of macroeconomic variables and variables their p values are less than 0.05. The paper finds that inflation and exchange rate have a considerable long-run effect on Indian market returns. The ECM coefficient of -0.0492 (p value = 0.005) is significant and based on the table no 5, the paper draws the conclusion thatreasonable speed of convergence to symmetry. Based on the output of tables 4 and 5, the paper show that while inflation has no significant short-term effect on Indian stock returns, but exchange rate has an effect on the Indian stock market in short run.

VEC market returns inflation rate andexchange rate, trend (constant)

Table-6: Vector error-correction model

Log likelihood = -1918.199			AIC = 27.76318		
Det (sigma_ml) = 1.75e+08			HQIC =27.91944		
			SBIC = 28.14783		
Equation	Parms	RMSE	R-sq	Chi2	P>chi2
D_Market returns (India)	5	275.255	0.0534	6.769968	0.2383
D_Inflation rate	5	2.82003	0.6012	180.8698	0.0000
D_exchange rate	5	944.802	0.0557	7.080683	0.2147

Table 6 shows that the estimation of VECM makes it possible to separate the long-run relationship between market returns, inflation rate and exchange rate from their short-run responses.The outcome shows that the error correction term VECM (-1) indicated in the equation is statistically accepted at 5% level of significance. The P>chi2of the error correction terms inflation rate and exchange rate are about 0.000 and 0.2147 with the expected negative impact on the Indian stock market returns. A significant error term with the right sign shows a strong effect of deviation of market returns from its long-run growth. The value of the coefficient of the error indicated the level of R-sq of adjustment. The coefficient value is indicating the impact level of stock market 0.0534 and the error correction term shows that about 5.4% of the discrepancies between the exchange rate and inflation rate so in this connection, the stock market volatility it has been showing negative impact on returns of market stakeholder in selected time period of the paper. The outcome of the long-run relationship between Indian stock market returns, exchange rate, and inflation in Table 6explored that the coefficient of inflation and exchange rate have a negative significant impact on stock returns, in that order,

from their p>chi2 values are less than 0.05. This stock market indices shown the negative relationship with the inflation and exchange rate and have an important long-run effect on stock market returns. The P>chi2 of market returns, inflation rate and exchange rate has indicated insignificance expect inflation rate (P>chi2 = 0.0000) is significant and the paper suggests a reasonable speed ofconvergence to stability. The outcome from the Table 6 shows that the inflation rate has no significant in short-term effect market returns, while exchange rate has a short-term effect on returns.

Co integrating for market returns in India, inflation rate and exchange rate
Table -7: Co- integrating equations

Equation	Parms	Chi2	p>chi2
_ce1	2	5430.816	0.0000

From Table 7, the result shows that the continuation of cointegration implies a valid assessment of long-run coefficients of the independent variables. The outcome explored in Table 7, chi2 value is 5430.816 and it indicates a significant level at 5%. The Indian market returns include the main two components of the stock market which are the changes in stock prices due to inflation rates and exchange rate, and measure the constant effects of inflation rates on stock market returns.

Table-8: Identification: beta is exactly identified
Johansen normalization restriction imposed

beta	**Coef.**	**Std.err**	**Z**	**P>|Z|**	**[95% conf.**	**Interval**
_ce1						
Market returns in India	1	.	.	.	.	.
Inflation rate	-266.1179	21.64097	-12.30	0.000	-308.5335	-223.7024
Exchange rate	-.2960755	.0040936	-72.33	0.000	-.3040988	-.2880523
_cons	-35.18507					

VEC Rank market returns, inflation rate and exchange rate, trend (constant)
Table-9: Johansen normalization restriction imposed

Trend: constant Sample: 3-240			Number of observation = 240 Lags =2		
Maximum Rank	Parms	LL	Eigen value	Trace statistic	5% Critical value

0	12	-1769.3718	.	120.0165	29.68
1	17	-1718.1985	0.55903	17.6699	15.41
2	20	-1711.4591	0.10222	4.1910	3.76
3	21	-1709.3636	0.03297		

The outcome of Johansen co-integration test explored in table 8 and 9 shows that both Trace and Maximum Eigen values confirm the existence of a long-run stability between stock market returns, changes in stock prices due to inflation and exchange rate. In addition, the outcome in Table no 8 and 9indicate that the coefficient of change in stock market returns due to inflation rateis negative and statistically significant (**P>|Z| =0.0000),**according **to Fama (1981), Mahmood et al.(2014), Muriuki (2014) and Bai (2014).**Table 8 shows a significant positive relationship between exchange rate and stock volatility in the short runs. Onthe other hand, the significance of changes in stock market returns due to the exchange rate isaffirmative and statistically significant in the long run when compared to USA dollar during covid19. The inflation rates indicates that the investors move stock prices effect on the level of stock market returns in India according to changes in expected returns rates. Table no 9 shows that arise in inflation rates drives the investors to increase stock prices and will have a positive impact on stock markets returns. Furthermore, the positive significance of change the returns in Indian stock market due to stock exchange rate is emphasized by the efficient level of the variables for high exchange rate only. The outcomeis accordingto **Nissim and Penman (2003)** who haveindicated in theirreport,that anaffirmative coefficientexists between stock returns and exchange rate.The present paper indicates the existence of apessimistic relationship between stock market returns and inflation.

Table No- 10: ARCH Regression

Distribution: Gaussian Log likelihood = 565.2751 N= 240				Sample : 2-240 Wald chi2(2) = 737521.87 Prob > chi2 = 0.0000		
Varibles	Coef.	OPG Std.Err.	Z	P>|Z|	[95% conf.	Interval
Marketreturns	-1.096627	.3595004	-3.05	0.002	-1.801235	-.3920189
Inflation rate	.2953547	.0003509	841.64	0.000	.2946669	.2960425
Exchange rate	-82.27212	11.44803	-7.19	0.000	-104.7098	-59.8344
ARCH Model						
ARCH L1.	1.220681	.2788916	4.38	0.000	.6740632	1.767298
ARCH L1.	-.0334731	.0553391	-0.60	0.545	-.1419357	.0749895

_cons	99.81056	47.37227	2.11	0.035	6.962612	192.6585

The table no 10 has illustarted that the volatlity of time series of the macroeconomic variables, the varaibles refer to the conditional variance of the data and the time variying volataility of stock market returns, the GARCH model has shown the results in table no 10, the exchange rate values in long run period it has shown very significant impact on the stock market returns, the coefficient value of inflation it has shown nagative impct on the stock market returns . the model of arch and garch (1,1)-M, it is assumed that effects of nagative and postive results on conditional variance are symmetric. Table 10 results explain how inflation affects on Stock Market Returns with the help of a GARCH model. In the GARCH model variance equation, the selected macroeconomic all the parameters are significant. In the same order, the ARCH model results have declared that the values negatively effects on stock market returns volatility. From the table no 10 the study has drawn the conclusion and suggestion , the calculation of coefficient is less than 0.005 so the volatility fluctuation are quite constant in the short run period but in the long run period the values negative effects on the shareholder returns. The coefficient is particularly high for NSE NIFTY 50 among all other indices, Furthermore, lagged conditional variance is significantly positive and less than one indicating that the impact of old news on volatility is significant. In GARCH model $0>\gamma$, In the GARCH models, negative and significant leverage effect parameter shows the existence of the leverage effect in returns. It shows that the stock returns are negatively correlated with changes in volatility signify that volatility tends to rise.

Conclusion

The research paper has drawn the conclusion about the importance of the stock market returns and inflation and exchange rates effects on the stakeholder expected returns . The paper uses the GARCH and ARDL methods to test the approach to build these relationships among the selected parameters like market returns, inflation and exchange rate. The paper exploreswhether there is continuous positive long run association among the stock markets, exchange rate and inflation rate in India. In the short run, the relationship among the variables shows the existence of a significantly negative impact on stock market returns.The paper also explores the existence of a statistically significant long and short run association between the stock markets returns in India, particularly during the period of the covid19 crisis. The velocity of adjustment estimated by the error correction model (ECM) for exchange rate and inflation rate in association with the Indian stock market returns indicates that the Indian market returns adjust moderately to

changes in consideration of inflation and exchange rate. The outcome of this paper implies that exchange rate and inflation rate are very important macroeconomic variables that control the flow of investments cycle in India.

The selected variables also explored the existence of long run association among the selected variables, showing long run dependencies, which provides important information for prospective investors on theIndianstock market (NSE and BSE).The paper further highlights some important points of statistical analytical methods used, such as Johansen co-integration test and VECM. The pragmatic findings make knowna significant relationship, in terms of co-integration and causality, between market returns, inflation rate and exchange rate, another important finding in this paper is the long-run coefficients are estimated for the determinants of stock market returns. Hence, increases in exchange rate (In Indian Currency) for instance, drive investors to increase stock prices to stay in the stock market returns.

'Declarations'

* Ethics approval and consent to participate
* Consent for publication
* Availability of data and material
* Competing interests
* Funding
* Authors' contributions
* Acknowledgements
* Authors' information (optional)

The above sections are not relevant to my manuscript and not Applicable

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