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A STUDY ON THE RELATIONSHIP BETWEEN FIRM-LEVEL MICROECONOMIC VARIABLES AND GDP USING NSE-LISTED COMPANIES

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ABSTRACT

***Purpose**: The present study has been focused on the selected macro and micro economic factors and their impact on the Nifty. The study has considered the 2013 to 2023 period with the secondary data. The study observes that the long run relationship exists between the macro and micro economic variables. The Robust Least Square Method has been applied and the result indicated that Global GDP has got higher impact on Nifty. The VAR Model has been applied and the Nifty is expected to move upwards in near future based on the Global GDP. This study is useful for the investors' fraternity, fund managers and academic research scholars.*

***Design/Methodology/Approach:** The main objectives of this study is to study the relationship of the selected macro and micro economic factors on NIFTY and to measure the influence of selected micro and macro-economic factors on NIFTY. We are use statistical techniques like Vector Auto Regression, Robust Least Square method.*

***Originality/Value**: The study has applied the VECM has been applied for the examination of the selected macro and micro economic factors with the Nifty and the result indicated that the significant relations have been observed with the Nifty.*

Findings:

VECM reports that global inflation is positively related to Indian Stock Market Indices (Nifty), while national inflation is negatively related to Nifty, The study examined that the Macro Variable ' Dollar Index' and the Micro Variable ' Rupee vs Dollar' had a positive relationship with the price of Nifty, This shows that the Macro and Micro variables have a long-term relationship with the nifty, It is synchronized that micro factors are found to have a positive influence, while except for global inflation, the remaining macro variable had influenced positively on Nifty.

KEYWORDS: *FDI, Select Economic, Economy Growth, SEM Model.*

***JEL Codes:** E44, G10, C32, O53*
***E44:** Financial Markets and the Macroeconomy*
***G10:** General Financial Markets*
***C32:** Time-Series Models*
***O53:** Asia*

1. INTRODUCTION

Microeconomics is a part of economics that contemplates the traits of the decision-makers within the economy such as households, individuals, and enterprises. The term 'firm' is usually used to refer to all sorts of trades. Microeconomics is different from the study of macroeconomics that considers the economy as an entity.

In Nov'23, select high frequency indicators exhibited mild growth while some indicators saw a decline vs. previous month. IIP saw an uptick in Oct'23, owing to growth in manufacturing and mining sectors. Cement production increased, while power consumption inched down; steel consumption remained consistent with previous month levels. Auto sector saw a seasonal deceleration across all segments in Nov'23. Most trade and investment

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indicators showed signs of improvement in Oct-Nov'23. Merchandise trade deficit narrowed sharply in Nov'23, attributable to a sharp decline in merchandize imports as gold imports moderated after a surge in Oct'23 during the festive season. Services trade surplus widened, driven by a fall in services imports. Forex reserves grew in Nov'23, after declining for 3 months, while FDI continued its upward trajectory for the second consecutive month. Dearth, choice, and opportunity cost: The manifesto on which the microeconomics notion is built reclines at the very heart of economic reasonability of how the decision-makers pick between scanty resources that have substitute uses. The customers demand goods and services and the producers offer these for sale, but none of the individuals can acquire everything they require from the economic system.

BFSI indicators showcased mixed trends. UPI transaction value rose, even as transaction volume slightly dipped, maintaining above the 11 billion mark for the second consecutive month. Aggregate deposits and credit remained consistent with previous month levels. NSE & BSE transactions increased significantly by 10% MoM in Nov'23 and 23% vs. Nov'22, while insurance premium fell substantially. In terms of macroeconomic indicators, CPI inflation rose to 5.6% in Nov'23, reversing its three-month declining trend owing to food price inflation and a low base effect. WPI inflation also rose to 0.26% driven by rising food and mineral prices, turning positive after remaining in deflationary territory for 7 months. Manufacturing PMI bounced back in Nov'23 from eight-month low in Oct'23, driven by strong demand and substantial easing in price pressures for raw materials. However, Services PMI dropped to its lowest value in 2023, attributable to a slowdown in new orders and output. GST collections saw a moderation in Nov'23, following a surge in Oct'23 attributed to festive spending.

2. REVIEW OF LITERATURE

- **Deepinder H. Dhiman (2023)**: This paper explains that thought that there was no causal relationship between the stock market index (BSE) and Real GDP, both of which are closely interlinked. The bubble in the stock market does not promote growth in the real economy.
- **Rosy Kalra (2023):** This paper said that the multiple correlation also shows a significant macro-economic relationship between variables. There is substantial dependence on most of the variables selected. Macroeconomic variables, GDP and oil levels are not significant in multiple regressions, i.e. in any of the multiple regression models, it is not found that Sensex is based on these variables.
- **Aurangzeb (2022):** The study analyzed the relationship between the main macroeconomic variables and the development of the South Asian stock market and observed that interest rates had a downward effect on the stock market due to higher interest rates, indicating negative patterns in stock market activity using the Multiple Regression Analysis.
- **Manish Manoj Kumar (2022):** study focused on the partnership between macro-economic indicators, i.e. FIIs, Gold Price, Fiscal Deficit, Exchange Rate, IIP & Inflation and Indian and U.S. stock prices, with Indian and U.S. stock market competence. We find that the Indian and US net 50 movements are 96.8% variance due to the macro-economic variables. Downbeat WPI-US relationship Nifty Interest rates are based on traditional non-linear techniques.
- **Sapna & Dani (2021):** critically examine the factors which affect the trading volume of BSE index. Findings of the study reflect that there exists a significant relationship between price and trading volume and it is affected by stock prices.
- **Shah (2021)** examined the trend and pattern of Foreign Institutional Investments flow in India and also describes the relationship between FII and NIFTY. From the research evidence, it has been observed that there is a moderate positive correlation between Foreign Institutional Investment and CNX NIFTY stock market.
- **Rajesh & Bhaskar (2020)** try to explore the variation in share prices of selected Indian manufacturing firms listed at Bombay Stock Exchange and it is concluded that Market Return, Growth in market & Industrial Production positively influences the stock returns at firm and industry level whereas rising inflation adversely affect the stock returns and GDP is insignificant but positively related to stock returns of the firm.
- **Bhag Singh Bodla (2020):** The decision to buy or sell or hold shares is based on the many factors involved. The present study selected the following variables: Treasury Bills price, Exchange Rate, Foreign Institutional Investors, Industrial Production Index, Inflation Rate, Indian stock market risk, US stock market risk and return to the test of Indian stock market average daily return to assess the effect of these factors on Indian stock market performance. Regarding the variable-wise effect on the return of BSE Sensex, the study shows that the variables FIIN, RS&P, S&P 500 return and USTBR have positive and

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significant regression coefficients, which means that these four factors have a significant and positive effect on the return of the Indian stock market. Research also provides that the previous day's return has no effect on the current day's return on stock.

- **Nathan Taulbe (2019):** Focused mainly on analyzing the effects of Real GDP, Unemployment and Fisher on S&P 500. GDP has a significant impact on the stock market. Unemployment rates would bring down the results of the stock market. In this case, the defensive sectors should do well.
- **Karam Pal and Ruhee Mittal (2019):** Analyzed 56 BSE senex and inflation, Treasury Bill, Exchange Rate and S&P CNX Nifty details on a quarterly basis from 1995 to 2008. By using the Root Analysis, Cointegration Test, and Error Correction Mechanism (ECM), Skewness and Kurtosis have shown that the distribution lacks symmetry. Inflation is affecting both inventories. GDS will not have major effects on the stock market.
- **Raman Preet Singh (2018):** In the current world financial market situation, almost every nation seems to have a stock exchange that reflects the financial health of its economy. In view of this massive growth in world trade, market fundamentals remained more or less the same. Like any other indicator, the stock exchange index assumes a time or a fixed flow sequence. This economic cycle has been assessed with the help of the leading and lagging metrics on developments in the financial markets. A detailed analysis was carried out in this report to qualitatively compare the S&P CNX Nifty with the main macroeconomic indicators such as GDP, inflation, exchange rate, industrial production, international direct expenditure, unemployment, crude oil. So all attributes contain some important information for predicting the index.
- **Ganavi K K (2018)** investigates the variation of share price on three prominent macro-economic variables viz., GDP, Inflation rate and Interest rate in NSE, India from April 2013 to March 2018 (Financial Year) via monthly data of nifty 50 companies.
- **Sarika Keswani, Bharti Wadhwa (2017)** Share prices and other financial assets have historically had a significant impact on the development and progress of financial activities, and this has always been evident. Macroeconomic factors demonstrate the success of each economic system and determine future investment. The study analyzed the impact of certain macro-economic factors (disposable revenues, interest rates, government policies, inflation and exchange rates) on the performance of the national and Bombay stock exchanges in the securities markets. Therefore, in the investigation, the causal link between the stock exchanges is returned and the macro-economic factors in the NSE and BSE are chosen.

4. RESEARCH GAP

A number of fundamental factors affect the stock market which has been proved by various researchers but the lacking areas that was found in the above given research papers. Many researchers mainly focused on either macro-economic variables or company specific variables. Many researchers mainly focused on national macroeconomic factors. Few of the researchers focused some of the global macroeconomic factors. None of them focused on both the national and global economic factors. The present study focuses on the national economic factors like GDP growth, Inflation, Industrial production Index (IIP), Exchange rate of Rupee against Dollar and the global factors like global GDP growth, Inflation, Dollar index, Purchasing Manufacturer's Index (PMI) which impacts NIFTY.

5. OBJECTIVES OF THE STUDY

- To study the relationship of the selected micro-economic factors on NSE-Nifty.
- To measure the future growth of NSE-Nifty based on macro indicators.

6. HYPOTHESES OF THE STUDY

H0: There is no long run relationship between economic factors and NSE-Nifty
H1: There is a long run relationship between economic factors and NSE-Nifty
H0: Insignificant impact of economic factors on NSE-Nifty
H1: Significant impact of economic factors on NSE-Nifty

7. RESEARCH METHODOLOGY

Study Period

The period of the study is between the financial year 2022-23. And the data collected from DPIIT website and Few journals.

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Stalactitical tools to be used

- VECM
- Robust Least Square method
- Vector Auto Regression

8. SCOPE OF THE STUDY

The present study has been emphasized on the economic factors impact on the Nifty. The study has considered the global and national economic factors and measures the relation, impact on the market returns. The study also predicted the future movement of the nifty based on the global and national GDP growth rate. The following economic factors were considered.

9. RESULT AND DISCUSSION

Table No: Unit Root Test

	Level		First difference		Second difference	
Factors	**T-Test**	**Probability**	**T-Test**	**Probability**	**T-Test**	**Probability**
Global GDP	-1.494309	0.5262	-6.141171	0.0000	-	-
Dollar index	-1.515584	0.5134	-5.178142	0.0002	-	-
Global inflation	-2.491427	0.1256	-9.606380	0.0000	-	-
PMI	-9.705827	0.0000	-	-	-	-
Indian GDP	-1.746299	0.4010	-6.24.330	0.0000	-	-
Rupee vs dollar	-12.46856	0.0000	-	-	-	-
Indian inflation	-1.903751	0.3269	-6.472244	0.0000	-	-
IIP	-2.159871	0.2236	-7.352898	0.0000	-	-
Nifty	-1.695663	0.4257	-1356456	0.0000	-	-

Interpretation

To examine the impact of economic factors (global and national) on Nifty, stationery test is conducted to analyse the data stability. As it is the time series data augmented dickey fuller test is attempted to check the stationarity of the data in unit root test. Normal Level: The test resulted that PMI and rupee vs dollar had the stationeries data in the normal level only as the probability value is less than 0.05. The test results that the factors like global GDP, dollar index, global inflation, Indian GDP, rupee vs dollar, Indian inflation, IIP and even nifty have got significance (i.e., <0.05) in the first difference.

Table No:2- VECM- Micro Factors

VAR Lag Order Selection Criteria						
Endogenous variables: NIFTY RUPEE_VS_DOLLAR INDIAN_GDP INFLATION IIP						
Exogenous variables: C						
Sample: 1 41						
Included observations: 38						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1503.349	NA	2.06e+28	79.38678	79.60225	79.46344
1	-1435.589	114.1217*	2.20e+27	77.13627	78.42910*	77.59625*
2	-1409.115	37.62073	2.19e+27	77.05870	79.42889	77.90199
3	-1376.762	37.46167	1.81e+27*	76.67168*	80.11923	77.89830
* Indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

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Interpretation

VAR lag order selection criteria table indicated lag order selected by the criterion. The above table depicts that LR test statistic seems to be significant at 5% level at lag 1. Similarly, Final prediction error (FPE) indicates lag order selection as lag 3. The information criterion like AIC (Akaike information criterion) is observed to indicates lad order selection as lag 3. Remaining criterion such as Schwarz information criterion (SIC) and HQ (Hannan Quinn Information criterion) seems to be indicated at lag1.Overall table concluded that this model indicates lag order selection as lag 1 which mean the Lower the value of the criterion the better the model fit to run Vector Error Correction Estimate Model.

Table No:3- VECM- Macro Factors

Vector Error Correction Estimates					
Date: 01/19/24 Time: 17:43					
Sample (adjusted): 3 41					
Included observations: 39 after adjustments					
Standard errors in () & t-statistics in [ ]					
Cointegrating Eq:	CointEq1				
Nifty (-1)	1.000000				
Rupee_vs_dollar (-1)	7.133564				
	(2.16501)				
	[3.29493]				
Indian GDP (-1)	-0.003021				
	(0.00012)				
	[-26.1359]				
Inflation (-1)	-10.02693				
	(1.38617)				
	[-7.23354]				
Iip(-1)	-2.546807				
	(2.34820)				
	[-1.08458]				
C	-5.319186				
Error correction:	D(NIFTY)	D(RUPEE_ VS_DOLLA R)	D(INDIAN_ GDP)	D(INFLATI ON)	D(IIP)
Cointeq1	-1.160022	-0.033687	-206.3625	0.110142	-0.011272
	(0.68248)	(0.02580)	(202.008)	(0.02381)	(0.01500)
	[-1.69972]	[-1.30563]	[-1.02156]	[4.62551]	[-0.75146]
D(nifty (-1))	0.774428	0.016053	191.1526	-0.057180	0.012996
	(0.72756)	(0.02751)	(215.350)	(0.02538)	(0.01599)
	[1.06443]	[0.58363]	[0.88764]	[-2.25256]	[0.81271]
D(rupee_vs_dollar(-1))	3.864650	-0.814379	675.4956	-0.721076	-0.107378
	(3.70458)	(0.14005)	(1096.52)	(0.12925)	(0.08143)
	[1.04321]	[-5.81489]	[0.61604]	[-5.57877]	[-1.31872]
D(indian_gdp(-1))	-0.002386	-1.60E-05	-0.601956	0.000250	-1.61E-05
	(0.00240)	(9.1E-05)	(0.70909)	(8.4E-05)	(5.3E-05)
	[-0.99600]	[-0.17700]	[-0.84891]	[2.98961]	[-0.30561]
D(inflation(-1))	-6.261675	-0.210277	-1046.492	-0.101545	-0.099521
	(4.11295)	(0.15549)	(1217.40)	(0.14350)	(0.09040)
	[-1.52243]	[-1.35236]	[-0.85962]	[-0.70762]	[-1.10087]
D(iip(-1))	-1.516334	0.278160	-238.6160	0.375473	-0.730629
	(4.74665)	(0.17945)	(1404.96)	(0.16561)	(0.10433)

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	[-0.31945]	[1.55011]	[-0.16984]	[2.26719]	[-7.00302]
C	-142.5589	-1.561294	-27016.68	-7.269115	-6.767616
	(320.157)	(12.1035)	(94763.6)	(11.1704)	(7.03700)
	[-0.44528]	[-0.12900]	[-0.28510]	[-0.65075]	[-0.96172]
R-squared	0.880118	0.809469	0.936887	0.878146	0.786493
Adj. R-squared	-0.802860	0.773744	-0.943696	0.855298	0.746460
Sum sq. resids	1.27E+08	181441.2	1.11E+13	154543.7	61332.65
S.E. equation	1991.803	75.29965	589555.5	69.49454	43.77951
F-statistic	0.515377	22.65860	0.204268	38.43485	19.64630
Log likelihood	-347.7560	-220.0185	-569.6788	-216.8897	-198.8685
Akaike AIC	18.19262	11.64198	29.57327	11.48152	10.55736
Schwarz SC	18.49120	11.94056	29.87186	11.78011	10.85595
Mean dependent	-140.7203	-3.040637	-28949.84	-7.246795	-6.030890
S.D. dependent	1914.081	158.3045	551276.3	182.6896	86.94561
Determinant resid covariance (dof adj.)		2.38E+27			
Determinant resid covariance		8.84E+26			
Log likelihood		-1486.593			
Akaike information criterion		78.28681			
Schwarz criterion		79.99302			
Number of coefficients		40			

Interpretation

The above table depicts the estimate value of Error correction model. Result indicates the dependent variable as Nifty and Independent variable as GDP,RUPEE Vs DOLLAR,INFLATION and IIP. Since, all the variables are co-integrating with each other which signify that it is having relationship between them. Most of the estimate values of GDP, rupee vs dollar, IIP on Nifty are observed to be having negative influence that means these factors are having negative impact on Nifty whereas, only inflation is having positive impact on Nifty. Further, Adjusted R square value seem to be strong as all the factors indicated more than 0.6 and Akaike information criterion and Schwarz criterion are strong in all the economic factors. Hence it can be concluded that there is a relationship between these global economic factors with Nifty.

System Equation:

Below equation is estimate to validate the model is having short run or long run relationship between economic factors and Nifty.

D(NIFTY) = C(1)*(NIFTY(-1) + 7.13356394675*RUPEE_VS_DOLLAR(-1) - 0.00302069858954*INDIAN_GDP(-1) - 10.0269325176*INFLATION(-1) - 2.54680679712*IIP(-1) - 5.31918643587) + C(2)*D(NIFTY(-1)) + C(3)*D(RUPEE_VS_DOLLAR(-1)) + C(4)*D(INDIAN_GDP(-1)) + C(5)*D(INFLATION(-1)) + C(6)*D(IIP(-1)) + C(7.

Nifty Vs Rupee Vs Dollar

Wald Test:			
System: %system			
Test Statistic	Value	Df	Probability
Chi-square	14.892407	2	0.0355
Null Hypothesis: C(1)=C(3)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-1.160022	0.682480
C(3)		3.864650	3.704577
Restrictions are linear in coefficients.			

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Interpretation

The wald test performed to test whether Nifty over rupee vs dollar is having short run or long run relationship between them. Result indicates that p-value is less that 0.05 which signifies the model is statically significant. Further the chi-square under wald test represent that its calculated value is observed to be greater than critical value i.e., (14.892407).Hence concluded that C(1) and C(3) is not equal to zero which mean there is a long run relationship between rupee vs dollar and Nifty.

Nifty Vs Indian GDP

Wald Test:			
System: %system			
Test Statistic	Value	Df	Probability
Chi-square	12.943678	2	0.0295
Null Hypothesis: C(1)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-1.160022	0.682480
C(4)		-0.002386	0.002396
Restrictions are linear in coefficients.			

Interpretation

The wald test performed to test whether Nifty over GDP is having short run or long run relationship between them. Result indicates that p-value is less that 0.05 which signifies the model is statically significant. Further the chi-square under wald test represent that its calculated value is observed to be greater than critical value i.e., (12.943678).Hence concluded that C(1) and C(4) is not equal to zero which mean there is a long run relationship between GDP and Nifty

Nifty Vs Indian Inflation

Wald Test:			
System: %system			
Test Statistic	Value	Df	Probability
Chi-square	12.978668	2	0.0255
Null Hypothesis: C(1)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-1.160022	0.682480
C(4)		-6.261675	4.112952
Restrictions are linear in coefficients.			

Interpretation

The wald test performed to test whether Nifty over Inflation is having short run or long run relationship between them. Result indicates that p-value is less that 0.05 which signifies the model is statically significant. Further the chi-square under wald test represent that its calculated value is observed to be greater than critical value i.e., (12.978668).Hence concluded that C(1) and C(5) is not equal to zero which mean there is a long run relationship between inflation and Nifty.

Nifty Vs Indian Inflation

Wald Test:			
System: %system			
Test Statistic	Value	Df	Probability
Chi-square	12.889588	2	0.0358
Null Hypothesis: C(1)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		-1.160022	0.682480
C(4)		-1.516334	4.746648
Restrictions are linear in coefficients.			

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Interpretation

The wald test performed to test whether Nifty over IIP is having short run or long run relationship between them. Result indicates that p-value is less that 0.05 which signifies the model is statically significant. Further the chi-square under wald test represent that its calculated value is observed to be greater than critical value i.e., (12.889588). Hence concluded that C(1) and C(6) is not equal to zero which mean there is a long run relationship between IIP and Nifty..

10. CONCLUSION

The present study has been focused on the selected macro-economic factors to know their impact on the Nifty. The study has been done based on the secondary data from the period of 2004 to 2019. The study has been framed two objectives to fill the gap. Firstly, the Vecm has been applied and the result indicated that the selected macro and micro economic factors are having the significant relation with the nifty. The Robust Least Square Method result indicated the impact of the selected macro and micro economic variables on the Nifty and found out that the Global GDP has got higher impact on Nifty compared with the Indian GDP. The VAR Model indicated that the Nifty is expected to go upwards positively based on the global GDP. Hence there is a need to do further research in this area by considering the fundamental factors influence on the equity markets.

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