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Impact of Global Stock Market on Indian Stock Market in the Post-Covid Era

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INTRODUCTION

India's stock market is heavily influenced by global and domestic factors. A global economic slowdown or recession fears, particularly in the US, Europe, or China, can reduce export demand and trigger foreign investor outflows, increasing market volatility. US Federal Reserve interest rate hikes often prompt capital shifts to US assets, weakening the Indian Rupee and impacting equities. Conversely, a dovish Fed attracts capital inflows. Geopolitical tensions such as the Russia-Ukraine conflict or trade wars disrupt supply chains, raise crude prices, and increase uncertainty. Oil price fluctuations directly affect India's import bill, inflation, and corporate earnings. Rising global inflation can prompt the RBI to raise interest rates, tightening liquidity and slowing growth. Similarly, volatility in global commodity prices pressures industry margins. The economic health of India's trading partners affects export performance, while weak domestic GDP growth signals lower corporate earnings, reducing investor confidence. High inflation erodes purchasing power and profitability, while RBI's interest rate decisions influence credit availability and consumption. Fiscal policy, including government spending and taxation, impacts sectors like infrastructure. Corporate earnings are key stock market drivers; poor results often lead to corrections. Industrial output (IIP) indicates manufacturing strength, while the Rupee's exchange rate affects import-heavy businesses and FPI behavior. Monsoon quality affects agriculture, rural demand, and overall growth. FPI flows significantly sway market direction, while DII activity offers stability during volatile periods. Investor sentiment, shaped by fear or euphoria, can exaggerate market movements. Liquidity levels influence price stability. Indian stock market is one of the outperforming capital markets globally and many economists are of opinion that India will contribute to the growth of global economy in the near future. But volatility is induced by global factors which ultimately affects global indices and the Indian stock market (Goel, 2023). Moreover, understanding the stock market movement for profitable investment is a billion-dollar

question and attracts multiple guesses and analysis to give answer for the same. It is always believed that Indian stock market movement is influenced by global stock market movement particularly US market. Bull or bearish movement in those markets create a change in the Indian market. That too after Covid-19 pandemic, the global stock market landscape has been significantly reshaped due to intensified connectivity among the global markets. Thus, in this article an attempt has been made to analyze the impact of global stock market movement on the Indian stock market movement. To study the same, the stock market indices of the 5 largest economies of the world based on their GDP were considered for the study.

REVIEW OF LITERATURE

Amanjot Singh and Manjit Singh (2016) (Singh, 2016) investigated the impact of US, Europe, Frontier and BRIC stock markets on Indian financial stress index. The study period was from October 2003 to October 2014. The study results show that there is no long-run relationship between the financial stress index and MSCI indices of the respective nations taken for the study. But there is a short-term dynamic relationship between the financial stress index and other country indices take for the study. Madhavi and Rajender Reddy (2018) (Reddy, 2018)analyzed the volatility effect of Brexit on Indian Stock Market. To study the same pre and post Brexit period from June 1, 2014 to May 26, 2018 period was taken. The study results show that volatility was triggered and impact of same was felt in Indian stock market during the announcement of the Brexit. But on the happening of the Brexit, the volatility was relatively weak with minimum volatility clustering. Thus, the results reveal that both positive and negative news creates volatility in stock markets. Areej Aftab Siddiqui and N.A.Azad (2012) (Azad, 2012) examined the relationship between foreign institutional investment (FII) flows and Indian stock market over a period of 10 years, from 2020 to 2010. The results of the study clearly show that there is a positive relationship between FII and Indian stock market. Analysis of impact of FII on various sectors clearly show that FII focuses mainly on metal, IT and auto sectors. Shilpa Lodha and g. Soral (2020) (Soral, 2020) explored the herd behavior of investors with respect to Indian and US stock markets by taking S&P CNX Nifty 50 and Dow Jones Industrial Average as a market proxy for the period from April 1, 2013 to March 31, 2018. The results of the analysis revealed that Indian

investors do not herd with US stock market. Dippi verma et.al. (2020) (Dippi Verma, 2020) examined the impact of covid-19 on Indian stock market with reference to Nifty 50 index. The period considered for the study is from May 16, 2019 to May 13, 2020. The study results reveal that the volatility of the market has been mildly affected by the total no of covid 19 cases existing in India.

OBJECTIVES OF THE STUDY

To understand the time varying behaviour of the variables
To examine the short and long run relationship between the variables
To determine the impact of index returns in one market on the other markets

RESEARCH METHODOLOGY

Descriptive research design has been adopted for the study. To study the impact of global stock market movement on the Indian stock market, indices of 5 largest economies of the world based on their GDP were considered for the study namely, Dow Jones index of US market, Shanghai Composite Index of China, Nikkei index of Japan, DAX(DE40) of Germany and Nifty 50 of India Secondary source of data for the post pandemic period from January 2022 to December 2023 was taken from investing.com website. The data was analyzed by applying relevant econometric model using E-Views software. To understand the time varying behavior of the indices taken for the study descriptive statistics and correlation analysis has been used. To examine the long-run relationship between the variable's co-integration rank test and Granger causality tests has been used. To determine the impact of index returns in one market on the other markets regression analysis has been used.

RESULTS AND DISCUSSIONS

Table 1: Descriptive Statistics

CRITERIA	DAX	DOWJONES	NIFTY50	NIKKEI	SHANGHAI
Mean	0.000	0.000	0.000	0.000	-0.001
Median	0.000	0.000	0.001	0.000	0.000
Maximum	0.045	0.049	0.041	0.039	0.048
Minimum	-0.067	-0.038	-0.046	-0.030	-0.040
Std. Dev.	0.013	0.010	0.010	0.011	0.010
Skewness	-0.513	-0.081	-0.558	0.073	0.012
Kurtosis	6.616	5.147	5.403	3.434	4.677
Jarque-Bera	245.451	80.533	122.006	3.639	48.880
Probability	0.000	0.000	0.000	0.162	0.000
Observations	417	417	417	417	417

From the detailed statistics presented in the table 1, it is inferred that the mean of variables is close to 0, this indicates that most values are closer to 0. The standard deviation of DAX is 0.013, this indicates that DAX is volatile than the other variables. The skewness of DAX, Dowjones and Nifty50 are negative which implies long left tails suggesting that the investors had high probability of earning negative returns. While the skewness of Nikkei and Shanghai are positive, which implies long right tails suggesting that the investors had high probability of earning positive returns. Similarly, the coefficients of kurtosis were found to be positive for all the variables and are greater than 3. The p value of Jarque-Bera test is <0.05 indicating the variables are not normally distributed except DAX.

Table 2: Correlation Analysis

VARIABLES	DAX	DOWJONES	NIFTY50	NIKKEI	SHANGHAI
DAX	1	0.582	0.572	0.419	0.187
DOWJONES	0.582	1	0.447	0.497	0.201
NIFTY50	0.572	0.447	1	0.338	0.147
NIKKEI	0.419	0.497	0.338	1	0.287
SHANGHAI	0.187	0.201	0.147	0.287	1

The correlation test results presented in the table 2 indicates that there exists a positive correlation among the markets. The degree of correlation among the markets is moderate in case of DAX, Dowjones, Nifty50 and Nikkei while Shanghai exhibits low correlation with the other markets.

Table 3: Cointegration Rank Test

No. of CE	Eigenvalue	T Statistic	Critical Value	Prob.**
DAX and DOWJONES				
None	0.017	9.138	15.495	0.353
At most 1	0.005	1.903	3.841	0.168
Trace test indicates no cointegration at the 0.05 level				
None	0.017	7.235	14.265	0.462
At most 1	0.005	1.903	3.841	0.168
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DAX and NIFTY50				
None	0.011	4.861	15.495	0.823
At most 1	0.001	0.248	3.841	0.619
Trace test indicates no cointegration at the 0.05 level				
None	0.011	4.613	14.265	0.790
At most 1	0.001	0.248	3.841	0.619
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DAX and NIKKEI				
None	0.011	4.987	15.495	0.810
At most 1	0.001	0.431	3.841	0.512
Trace test indicates no cointegration at the 0.05 level				
None	0.011	4.556	14.265	0.797
At most 1	0.001	0.431	3.841	0.512
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DAX and SHANGHAI				

None	0.034	15.059	15.495	0.058
At most 1	0.002	0.967	3.841	0.325
Trace test indicates no cointegration at the 0.05 level				
None	0.034	14.092	14.265	0.053
At most 1	0.002	0.967	3.841	0.325
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DOWJONES and NIFTY50				
None	0.024	10.531	15.495	0.242
At most 1	0.001	0.465	3.841	0.495
Trace test indicates no cointegration at the 0.05 level				
None	0.024	10.067	14.265	0.208
At most 1	0.001	0.465	3.841	0.495
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DOWJONES and NIKKEI				
None	0.018	9.110	15.495	0.355
At most 1	0.004	1.453	3.841	0.228
Trace test indicates no cointegration at the 0.05 level				
None	0.018	7.657	14.265	0.415
At most 1	0.004	1.453	3.841	0.228
Max-eigenvalue test indicates no cointegration at the 0.05 level				
DOWJONES and SHANGHAI				
None	0.033	14.859	15.495	0.062
At most 1	0.002	0.809	3.841	0.369
Trace test indicates no cointegration at the 0.05 level				
None	0.033	14.050	14.265	0.054
At most 1	0.002	0.809	3.841	0.369
Max-eigenvalue test indicates no cointegration at the 0.05 level				
NIFTY50 and NIKKEI				

None	0.019756	9.176362	15.49471	0.3493
At most 1	0.002262	0.935367	3.841466	0.3335
Trace test indicates no cointegration at the 0.05 level				
None	0.019756	8.240995	14.2646	0.3547
At most 1	0.002262	0.935367	3.841466	0.3335
Max-eigenvalue test indicates no cointegration at the 0.05 level				
NIFTY50 and SHANGHAI				
None	0.032133	13.50874	15.49471	0.0974
At most 1	4.87E-05	0.020117	3.841466	0.8871
Trace test indicates no cointegration at the 0.05 level				
None	0.032133	13.48862	14.2646	0.066
At most 1	4.87E-05	0.020117	3.841466	0.8871
Max-eigenvalue test indicates no cointegration at the 0.05 level				
NIKKEI and HANGHAI				
None	0.026437	11.14506	15.49471	0.2027
At most 1	0.000193	0.079582	3.841466	0.7779
Trace test indicates no cointegration at the 0.05 level				
None	0.026437	11.06548	14.2646	0.151
At most 1	0.000193	0.079582	3.841466	0.7779
Max-eigenvalue test indicates no cointegration at the 0.05 level				

The Johansen cointegration test is a statistical method used to assess whether a set of variables are cointegrated. Cointegration is a statistical property that implies a long-run, stable relationship between two or more-time series, even though each individual series may be non-stationary. The Johansen test allows for the identification of more than one cointegrating vector. This is important because economic relationships may involve multiple factors influencing the variables in the long run. The Cointegration test results presented in the above table -3 indicates that there is no long run relationship between the selected indices. The insignificant p values of the trace statistics and

the max-eigenvalue test that there are no cointegrating vectors among the variables in the long run. Hence it is implied that there is no long run relationship between the variables.

Table 4: Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
DOWJONES does not Granger Cause DAX	416	7.18507	**0.0076**
DAX does not Granger Cause DOWJONES		0.33522	0.5629
NIFTY50 does not Granger Cause DAX	416	0.41821	0.5182
DAX does not Granger Cause NIFTY50		1.07681	0.3
NIKKEI does not Granger Cause DAX	416	0.11132	0.7388
DAX does not Granger Cause NIKKEI		24.1566	**1.00E-06**
SHANGHAI does not Granger Cause DAX	416	0.69641	0.4045
DAX does not Granger Cause SHANGHAI		0.77432	0.3794
NIFTY50 does not Granger Cause DOWJONES	416	0.2412	0.6236
DOWJONES does not Granger Cause NIFTY50		5.07617	**0.0248**
NIKKEI does not Granger Cause DOWJONES	416	0.47706	0.4901
DOWJONES does not Granger Cause NIKKEI		14.8302	0**.0001**
SHANGHAI does not Granger Cause DOWJONES	416	0.03122	0.8598
DOWJONES does not Granger Cause SHANGHAI		0.12653	0.7222
NIKKEI does not Granger Cause NIFTY50	416	0.11686	0.7326
NIFTY50 does not Granger Cause NIKKEI		3.76697	**0.**053
SHANGHAI does not Granger Cause NIFTY50	416	2.85047	0.0921
NIFTY50 does not Granger Cause SHANGHAI		0.63263	0.4268
SHANGHAI does not Granger Cause NIKKEI	416	4.43838	**0.0357**
NIKKEI does not Granger Cause SHANGHAI		0.40957	0.5225

Granger causality test is a widely used statistical test that helps in identifying the causal relationships between variables in the short run and provide meaningful insights for further analysis. While performing Granger Causality test it is vital to ensure that the variables is stationary

and the appropriate lag length is identified using the lag order suggested by Schwarz Information Criterion (SC), Hann-Quinn Information Criterion (HQ) and Akaike Information Criterion (AIC). The lag length was ascertained using the VAR framework, and 3 out of 5 parameters suggested the lag order 1. Hence the lag order used was 1. The significant p- values of the granger causality test results presented in table 4 indicates that the null hypothesis 'DOWJONES does not Granger Cause DAX', 'DAX does not Granger Cause NIKKEI', 'DOWJONES does not Granger Cause NIFTY50', 'DOWJONES does not Granger Cause NIKKEI' and 'SHANGHAI does not Granger Cause NIKKEI' is rejected. There exist a uni directional causation between the variables. The variables demonstrate a significant relationship in the short run. The lagged return causes the current return. The current returns of the stock index 'Nikkei' is caused by the lagged returns of DAX, Dowjones and Shanghai.

Table 5: Regression Analysis - Dependent Variable: NIFTY50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000	0.000	0.996	0.320
DAX	0.351	0.038	9.155	0.000
DOWJONES	0.143	0.052	2.773	0.006
NIKKEI	0.065	0.043	1.506	0.133
SHANGHAI	0.012	0.040	0.297	0.767
R-squared	0.351	Prob(F-statistic)		0.000
Adjusted R-squared	0.345	Durbin-Watson stat		2.073

The OLS estimates presented in the table 5, indicates that a one unit change in the returns of independent variables (DAX and Dowjones) causes 0.35 and 0.14 units change in Nifty50 returns. This indicates that there is a symmetric relationship between the variables. The adjusted R_2 indicates that 34% of the changes in the Nifty50 returns can be explained by the changes in DAX and Dowjones returns. The Durbin-Watson statistic and the significant probability value indicate that the model is stable.

Table 6: Regression Analysis - Dependent Variable: DAX

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000	0.000	-0.36	0.72
DOWJONES	0.458	0.057	8.10	0.00
NIFTY50	0.481	0.053	9.15	0.00
NIKKEI	0.127	0.050	2.53	0.01
SHANGHAI	0.037	0.047	0.79	0.43
R-squared	0.471	Prob(F-statistic)		0.000
Adjusted R-squared	0.466	Durbin-Watson stat		2.207

The OLS estimates presented in the table 6, indicates that a one unit change in the returns of independent variables (Nikkei, Nifty50 and Dowjones) causes 0.45, 0.48 and 0.12 units change in DAX returns. This indicates that there is a symmetric relationship between the variables. The adjusted R_2 indicates that 46% of the changes in the DAX returns can be explained by the changes in Nikkei, Nifty50 and Dowjones returns. The Durbin-Watson statistic and the significant probability value indicate that the model is stable.

Table 7: Regression Analysis - Dependent Variable: DOWJONES

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000	0.000	-0.282	0.778
DAX	0.300	0.037	8.099	0.000
NIFTY50	0.128	0.046	2.773	0.006
NIKKEI	0.259	0.039	6.683	0.000
SHANGHAI	0.028	0.038	0.734	0.463
R-squared	0.428	Prob(F-statistic)		0.000
Adjusted R-squared	0.423	Durbin-Watson stat		2.145

The OLS estimates presented in the table 7, indicates that a one-unit change in the returns of independent variables (Nikkei, Nifty50 and DAX) causes 0.30, 0.28 and 0.12 units change in Dowjones returns. This indicates that there is a symmetric relationship between the variables. The adjusted R_2 indicates that 42% of the changes in the DAX returns can be explained by the changes

in Nikkei, Nifty50 and Dowjones returns. The Durbin-Watson statistic and the significant probability value indicate that the model is stable.

Table 8: Regression Analysis - Dependent Variable: NIKKEI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000	0.000	0.796	0.427
DOWJONES	0.377	0.056	6.683	0.000
DAX	0.121	0.048	2.531	0.012
NIFTY50	0.084	0.056	1.506	0.133
SHANGHAI	0.194	0.045	4.292	0.000
R-squared	0.308	Prob(F-statistic)		0.00
Adjusted R-squared	0.301	Durbin-Watson stat		2.15

The OLS estimates presented in the table 8, indicates that a one unit change in the returns of independent variables (Shanghai, Dowjones and DAX) causes 0.37, 0.12 and 0.19 units change in Nikkei returns. This indicates that there is a symmetric relationship between the variables. The adjusted R_2 indicates that 30% of the changes in the Nikkei returns can be explained by the changes in Shanghai, DAX and Dowjones returns. The Durbin-Watson statistic and the significant probability value indicate that the model is stable.

Table 9: Regression Analysis - Dependent Variable: SHANGHAI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.00	0.00	-1.29	0.20
DOWJONES	0.05	0.06	0.73	0.46
DAX	0.04	0.05	0.79	0.43
NIFTY50	0.02	0.06	0.30	0.77
NIKKEI	0.22	0.05	4.29	0.00
R-squared	0.09	Prob(F-statistic)		0.000
Adjusted R-squared	0.08	Durbin-Watson stat		2.129

The OLS estimates presented in the table 9, indicates that a one unit change in the returns of Nikkei causes 0.22 units change in Shanghai returns. This indicates that there is a symmetric relationship

between the variables. The adjusted R_2 indicates that 8% of the changes in the Shanghai returns can be explained by the changes in Nikkei returns. The Durbin-Watson statistic and the significant probability value indicate that the model is stable.

FINDINGS

Analysis of the time varying behavior of indices based on descriptive statistics denotes that mean return of all the markets were the same for the study period. The returns of Germany market (DAX) is highly volatile when compared to other markets. Positive skewness of Nikkei and Shanghai indicates that investors of Japan and China stock markets would have exposed to high probability of earning positive returns. More over various global markets taken for the study indicates that there exists a positive correlation among the markets. But the correlation is moderate in case of DAX, Dowjones and Nikkei, while Shanghai exhibits low correlation with all the markets of study.Examination of long run relationship based on co-integration denotes that there is no long-run relationship among the global markets taken for the study. Analysis of short-run relationship using granger causality denotes that there is unidirectional short-run relationship between Dowjones and DAX, Nikkei and DAX, Nifty 50 and Dowjones, Nikkei and Dowjones, Shanghai and Nikkei. But whereas there is bidirectional short-run relationship between nifty 50 and DAX, Shanghai and DAX, Shanghai and Dowjones, Nikkei and Nifty 50, Shanghai and Nifty 50.Regression analysis reveals that upto 34% of Nifty 50 movement is influenced by DAX and Dowjones. 46% of changes in the DAX return is explained by changes in Nikkei, Nifty 50 and Dowjones. 42% of DAX return is explained by Nikkei, Nifty 50 and Dowjones. 30% of Nikkei returns are explained by Shanghai, DAX and Dowjones. 8 % of Shanghai return is explained by Nikkei.

CONCLUSION.

The Indian stock market is always looked up by global investors since it is holds second position in the fastest growing economy. The Indian market seems to give an average stable return and correlated more with Dowjones and DAX rather than with Nikkei and Shanghai. Analysis of long-run relationship show that the Indian stock market is not influenced by any other markets taken for

the study in the long-run. Analysis of short-run relationship reveals that there exists a unidirectional relationship between Nifty 50 and Dowjones and there exist bidirectional relationship between Nifty 50 and DAX, Nifty 50 and Nikkei, Nifty 50 and Shanghai. Regression analysis indicates that up to 34% of Nifty 50 returns are explained by DAX and Dowjones return. Thus all the analysis indicates that Indian stock market is influenced less by global stock market movement and it has its own uniqueness in terms of providing returns to the investors such as company performance, industry performance and diversification, economic factors, growth policies of government, stable government and geo-political factors of the country.

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