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Relationship between Foreign Direct Investment and Stock Market Indices in India

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Abstract: The study investigates the connection between FDI and Indian stock market indices. The study uses secondary data and it is descriptive. Data of FDI, S&P BSE Sensex and NSE Nifty 50 from the financial year 2000 to 2022 have been taken from the reports of the Department for Promotion of Industry and Internal Trade (DPIIT), website of BSE and NSE respectively. Karl Pearson's correlation and Regression Analysis techniques has been used for the study. The study's findings demonstrate a statistically significant positive correlation between FDI & Sensex and FDI & Nifty, as well as a significant beneficial effect of FDI on the indices of the Indian stock market.

Keywords: FDI, S&P Sensex, Nifty 50, Stock Market.

I.INTRODUCTION

According to the IMF, FDI is "An Investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor. The investor's purpose is to have an effective voice in the management of the enterprise". Previous research shows that The development of the stock market has been impacted by many macroeconomic variables. . Foreign Direct Investment (FDI) is one of the macroeconomic variables which influenced the stock market . FDI significantly affects the stock exchanges of India (Gupta, 2017). The Indian stock market is a barometer for the Indian economy therefore the development of the Indian stock market is necessary for the development of the Indian economy. Various previous study shows that FDI is one of the macroeconomic variables which affects the Indian stock market therefore there is need to analyses the impact of FDI on Indian stock market with latest data so that government can take necessary action for the development of Indian stock market.

II.LITERATURE REVIEW

Bihari & Das (2020) examined the interlinkage of FDI with the Indian stock market. It was discovered that there was a significant relationship between FDI and the stock market index of BSE and NSE. They concluded that the stock market's performance has been greatly impacted by FDI. Gupta (2017) looked at the effect of FDI flows on the two dominant Indian Stock exchanges i.e. Sensex and Nifty over the period of 10 years. The study indicated that FDI significantly affects the Indian stock exchange. Amalraj, V, & Liya (2016) examined the FDI & FII's effects on the Stock market index (Nifty). According to the analysis, FII has a more significant impact on Nifty than FDI. FDI has a negligible effect on the Nifty. Thomas (2016) examined the relationship of FDI with GDP, Nifty and Sensex. The study found that FDI inflow has an increasing trend in India and FDI is positively correlated to the GDP growth rate, Sensex and Nifty. It concluded that GDP and stock market movements depend upon FDI to a greater extent. Kapoor & Sachan (2015) examined FDI and FII's impact on the Stock exchanges of India. 13 years of data from 2002 to 2014 of FDI, FII, Sensex and Nifty was taken for study. It was discovered that FDI is positively associated with stock market benchmark indices but there is a weak association while FII is positively associated with stock market benchmark indices and there is a strong positive relationship with them. However, FII has a direct relationship with stock markets, but FDI does not. The expansion of the stock market is significantly aided by FII. Chauhan (2013) assessed how FDI, FIIs, and FPIs affected the Indian stock market It was found that FDI significantly and positively affects both Sensex and Nifty. FIIs' influence on the Sensex is negligible, but their influence on the Nifty is substantial. It was found that FPI was the least significant factor. Sultana & Pardhasaradhi (2012) examined FDI and FII's effects on the Indian stock market. They found that FDI is significantly related to stock market benchmarking indices and the relationship is positive. FII & Sensex and FII & Nifty have a moderate correlation. The Indian stock market was found to have been significantly impacted by FDI and FII.

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III. OBJECTIVES OF THE STUDY

The study's main aim is to examine the relationship of FDI with the stock market indices of India. The two most dominant stock exchanges in India are the National Stock Exchange and the Bombay Stock Exchange. S&P BSE Sensex and NSE Nifty 50 are the benchmark indices of BSE and NSE respectively. Therefore, the objective of the study is to examine the relationship of FDI with benchmark indices of BSE and NSE.

IV. RESEARCH METHODOLOGY

A. TIME PERIOD:

The present study takes the data of FDI, S&P BSE Sensex and Nifty 50 from 1st April 2000 to 31st March 2022.

B. DATA COLLECTION:

Secondary data has been collected for study purpose. The yearly data (Financial year) relating to FDI has been collected from the reports of the Department for Promotion of Industry and Internal Trade (DPIIT). The S&P BSE Sensex and Nifty 50's daily closing prices were obtained from the websites of BSE and NSE respectively and the average of these closing prices was used to calculate the indices' values for each financial year.

C. STATISTICAL TOOLS & TECHNIQUE

The correlation coefficient developed by Karl Pearson and simple linear regression are two statistical techniques that have been used for data analysis. The correlation coefficient is a statistical metric used to determine how closely two variables are related. The correlation coefficient has a range between -1 and 1. A negative value of correlation shows an inverse relationship and a positive value of correlation shows a positive relationship between two variables. A statistical method called regression analysis is used to assess how independent factors affect the dependent variable. To study the FDI's impact on S&P Sensex and Nifty 50, Simple Linear Regression is applied. FDI is an Independent variable. For model 1, S&P Sensex is the dependent variable and Nifty 50 is the dependent variable for model 2.

D. MODEL BUILDING

Two models were built to investigate the effects of FDI on the stock market indices. S&P Sensex is shown as the dependent variable in Model 1, while FDI is shown as the independent variable. Model 2 shows FDI as the independent variable and Nifty 50 as the dependent variable.

The two model equations are presented below:

S&P BSE Sensex= a + bFDI

Nifty 50= a + bFDI

V. DATA ANALYSIS AND INTERPRETATION

Table 1: yearly data of FDI, S&P BSE Sensex and Nifty 50

year	FDI (US$ million)	S&P BSE Sensex	Nifty 50
2000-01	4029	4269.69	1334.76
2001-02	6130	3331.95	1077.03
2002-03	5035	3206.29	1037.23
2003-04	4322	4492.19	1427.50
2004-05	6051	5740.99	1805.26
2005-06	8961	8280.08	2513.44
2006-07	22826	12277.33	3572.44
2007-08	34843	16568.89	4896.60
2008-09	41873	12365.55	3731.03

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2009-10	37745	15585.21	4657.77
2010-11	34847	18605.18	5583.54
2011-12	46556	17422.88	5242.74
2012-13	34298	18202.10	5520.34
2013-14	36046	20120.12	6009.51
2014-15	45148	26556.53	7967.34
2015-16	55559	26322.10	7983.79
2016-17	60220	27338.22	8421.19
2017-18	60974	32396.83	10030.13
2018-19	62001	35971.79	10859.51
2019-20	74391	38756.70	11487.96
2020-21	81973	40826.39	12016.89
2021-22	84,835	55774.58	16662.74

(Source: website of DPIIT, BSE and NSE)

Table 2: Correlation of FDI with Sensex and Nifty

		FDI (US$ million)	S&P BSE Sensex	Nifty 50
FDI (US$ million)	Pearson Correlation	1	0.9543**	0.9539**
**. Significant at the 99% level of confidence and 1% level of significance.				

Table 2 displays the correlation of FDI with the Sensex and Nifty. Based on the above result, it can be concluded that there is a statistically significant positive correlation between FDI and both the Sensex and the Nifty. At a 1% threshold of significance, the correlation coefficient is significant.

A. RELATIONSHIP OF FDI WITH S&P BSE SENSEX
INDEPENDENT VARIABLE: FDI
DEPENDENT VARIABLE: S&P BSE SENSEX

TABLE 3: SUMMARY OF FIRST MODEL

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R	R^2	Adjusted R Square	Standard Error of Estimate	Durbin-Watson (DW)
.954a	.911	.906	4305.65943	1.360

A. PREDICTORS (EXPLANATORY VARIABLE): FDI
B. RESPONSE VARIABLE (EXPLAINED VARIABLE): S&P BSE SENSEX

Table 3 shows the summary of model 1 in which the response variable (dependent variable) is the benchmark index of BSE i.e. S&P BSE Sensex, while the predictor (independent variable /explanatory variable) is FDI. The value of the coefficient of determination (R^2) is .911 which is the square of r i.e. coefficient of correlation. This value shows that 91.1% variation has been explained by this model. It means 91.1% variation in the dependent variable (S&P BSE Sensex) is due to the independent variable (FDI) and the remaining 8.9% variation is not explained by this model. The S&P BSE Sensex's remaining variance is caused by several additional factors that are not taken into account by this model.

Table 4: Result of Analysis of Variance (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.789E9	1	3.789E9	204.372	.000[a]
Residual	3.708E8	20	1.854E7		
Total	4.160E9	21			

a. Predictors (explanatory variable): FDI
b. Response Variable (explained variable): S&P BSE Sensex

This model's statistical significance is tested in ANOVA table 4. The F-statistics are 204.372, and the p-value is .000 (5.820767101938712E-12). The Null hypothesis has been rejected and an alternate hypothesis has been accepted as the probability value (p-value) is less than 0.05. Therefore, the conclusion can be drawn that the model is significant or that FDI has a significant positive relationship with Sensex.

Table 5: Results of coefficient

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	141.185	1676.758		.084	.934
FDI	.520	.036	.954	14.296	.000

a. Response Variable: S&P BSE Sensex

Table 5 shows the coefficients value of regression model 1. Unstandardized Coefficients (B i.e. beta value) shows the slope value of model. Beta value indicates change in the response variable caused by a unit change in the predictor variables. The above table shows that the beta value is .520, which means if FDI is changed by 1 unit then Sensex will be changed by .520 unit and the estimated regression equation will be:

S&P BSE Sensex = 141.185 + .520 FDI

B. RELATIONSHIP OF FDI WITH NIFTY 50

Independent variable: FDI

Dependent variable: Nifty 50

TABLE 6: SUMMARY OF THE SECOND MODEL

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R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.954[a]	.910	.906	1289.57947	1.394

a. Predictors (explanatory variable): FDI
b. Response Variable (explained variable): Nifty 50

Table 6 shows the summary of model 2 in which FDI is taken as the independent variable and Nifty 50 is taken as a dependent variable. The value of the coefficient of determination (R^2) is .910 which is the square of r i.e. coefficient of correlation. This value shows that 91% variation has been explained by this model. It means 91% of the variation in the dependent variable (Nifty 50) is due to the independent variable (FDI) and the remaining 9% of the variation is not explained by this model and The Nifty 50's remaining variance is caused by several factors that are not taken into account by this model.

Table 7: Result of Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3.365E8	1	3.365E8	202.314	.000[a]
Residual	3.326E7	20	1663015.218		
Total	3.697E8	21			

a. Predictors(explanatory variable): FDI
b. Response Variable (explained variable): Nifty 50

This model's statistical significance is tested in ANOVA table 7. The F-statistics is 202.314 with a p-value of .000 (6.38502572974587E-12)The null hypothesis has been rejected and an alternate hypothesis has been accepted as the probability value (p-value) is less than 0.05. Therefore conclusion can be drawn that the model is significant or that FDI has a significant positive relationship with Nifty 50.

Table 8: Results of coefficient

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	105.962	502.203	.954	.211	.835
FDI	.155	.011		14.224	.000
a. Response Variable: Nifty 50					

Table 8 shows the coefficient value of regression model 2. Unstandardized Coefficients (B i.e. beta value) show the slope value of the model. The Beta value indicates a change in the response variable caused by a unit change in the predictor variables. The above table shows that the beta value is .155, which means if FDI is changed by 1 unit then Nifty 50 will be changed by .155 unit and the estimated regression equation will be:
Nifty 50 = 105.962 + .155 FDI

VI. CONCLUSION

The results of the study show that FDI is highly positively related to the benchmark index of both the leading stock exchanges of India. Both the Sensex and the Nifty are found to be significantly predicted by FDI. According to the results of the present investigation, it can be said that FDI has a very significant positive effect on the indices of the Indian stock market. It implies that the Sensex and Nifty will rise strongly if FDI rises. The study discovered that FDI significantly contributes to the growth of the Indian stock market. Since the stock market is a leading indicator of the

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Indian economy, the growth of the stock market is essential for the expansion of the Indian economy. The Indian government should use the study's findings while drafting FDI policies. The results suggest that the government should encourage foreign direct investment in India.

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