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CURRENCY EXCHANGE RATE AND ITS IMPACT ON MIDCAP INDICES: AN EMPIRICAL INDIAN PERSPECTIVE

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ABSTRACT

The market value of firms and the stock prices can be essentially influenced by numerous variables out of which changes in the exchange rate are vital. There's still no agreement on the relationship between stock market indices and exchange rates in spite of the fact that the subject has been broadly examined. The monetary hypothesis clarifies that the value of a firm ought to be affected by exchange rates and interest rates. The upward and downward exchange rate movements may decide the stock prices of the firms. In India, foreign direct investment (FDI) is a vital component of stock prices and the drift of FDI may significantly be influenced by changes in exchange rate either devaluing or increasing in value. Essentially, the exchange rates are influenced by the movements in stock prices.

Keywords: *Market Value, FDI, Hypothesis, Shareholders, Exchange Rates.*

Introduction

The stock market return is one of the foremost important and most vital metrics for the management and the shareholders of the organizations. The study on the variables that affect the share prices is running the inquire about databases for the most part since the scholar and the applicants need to optimize the management forms and hence give an ensured and stabilized performance of the stock. One figure that impacts the return on stocks and the interest of speculators within the stock is the foreign exchange rate.

Foreign exchange return is additionally vital within the context of macroeconomic management of a nation meaning to say that in case a relationship between the foreign exchange rate and the stock market return is found to exist, at that point the government has the opportunity to oversee the exchange rate and hence the return on the stock market.

Literature Review

Alam and Alam (2014) examines the execution of foreign institutional investments within the Indian stock market. After watching the development of FIIs movement and the effect of the exchanging of Foreign Institutional Investors on the execution of the Indian capital market and by analyzing the observational connection between stock market return and FII streams, it is found that the FII net inflows are related with the Sensex and explains the developments within the Indian capital market.

Bohra and Dutt (2011) points at understanding the behavioural design of FII by recognizing the Decade drift investigation of FII venture in India and endeavours to display the relationship between FII turnover and turnover of diverse individual groups of offers in BSE Sensex. The researcher found a positive relationship between the stock market and investment of FII's in a relationship that Sensex takes after the investment behaviour of FII's, but there's some exception seen between the years 2005 and 2008. It moreover appears that the positive or negative development of FIIs leads to a major change/shift

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within the assumptions of household or related investors within the market and recommends the approach suggests that the specialists can center on household economic approaches to stabilize the stock market. Mishra P.K., Das K.B., and Pradhan B.B., (2009) evaluated the performance of the Indian capital market by empirically learning the influence of net equity investment by FIIs on stock yields. This study offers the indication of positive correlation between FII net flows into India and stock market yield and correspondingly detected that the actions in the Indian capital market are legitimately elucidated by the FII net inflows.

Bhattacharya Basabi and Mukherjee Jaydeep (2008), examined the landscape of the causal relationship between stock returns, net foreign institutional investment (FII) and exchange rate in India indicating the relationship between stock price and exchange rate is noticeable not due to the existence of foreign institutional investors alone, but attributed to other influences as well. It advocates the policy inference that the experts can emphasize on domestic economic policies to alleviate the stock market.

Problem Statement

To study the "Impact of currency exchange rate on Indian Stock market indices"

Objectives of Study

Primary Objectives

- To Study the relationship between currency exchange rate and stock market indices
- To Study the impact of Currency exchange rates on Selected stock market indices such as NIFTY 50, SENSEX, NIFTY MIDCAP 100

Secondary Objectives

- To Study the Trend of currency exchange and Indian Stock market indices
- To develop the forecasting based on available of data and time series analysis

Research Design

The research used here is CAUSAL RESEARCH as it tries to find out the cause and effect relationship between exchange rates and stock prices. It tries to find out what are the reasons due to which exchange rates fluctuates and what are its impact on the stock prices of the stocks listed in a stock exchange. The data for carrying out the study has been from the various websites, brochures and pamphlets printed by the organization.

Sampling Plans

Sample Units

Sampling units would be the BSE Index SENSEX, NSE Index NIFTY 50 & NIFTY MIDCAP 100 and Currency Market Index USD/INR

Sample Size

The total sample size of the project is 10-year data exchange rate & Stock exchange index covering.

Sample Method

The sampling technique that will be used for the purpose of study would be SIMPLE Random sampling method.

Data Collection Sources

Secondary Data Collection

Different websites such as bseindia.com & nseindia.com, Investing.com, economictimes.com etc.and different International journals.

Data Analysis

Correlation & Regression

MIDCAP / USD

Corelation

Hypothesis

H_0: There is no significance relation between MIDCAP and USD/INR

H_1: There is significance relation between MIDCAP and USD/INR

Descriptive Statistics			
	Mean	Std. Deviation	N
MIDCAP	10223.50	4431.431	2468
USD/INR	56.33	8.421	2468

Correlations			
		MIDCAP	**USD/INR**
Pearson Correlation	MIDCAP	1.000	.746
	USD/INR	.746	1.000
Sig. (1-tailed)	MIDCAP	.	.000
	USD/INR	.000	.
N	MIDCAP	2468	2468
	USD/INR	2468	2468

Hypothesis Analysis

From the above table, it has been analyzed that the significant value is 0.000 which is less than 0.05. Therefore, H0 is rejected and H1 is accepted and so, there is significant relation between MIDCAP and USD/INR.

Regression

Hypothesis

H_0: There is no significance impact of USD/INR on MIDCAP

H_1: There is significance impact of USD/INR on MIDCAP

Model Summary									
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**				
					R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.746[a]	.557	.557	2950.628	.557	3098.526	1	2466	.000
a. Predictors: (Constant), USD/INR									
b. Dependent Variable: MIDCAP									

Hypothesis Analysis

From the above table, it has been analyzed that the significant value is 0.000 which is less than 0.05. Therefore, H0 is rejected and H1 is accepted and so, there is significance impact of USD/INR on MIDCAP

Time-Series Analysis

Unit Root Test (Augmented Dickey-Fuller Test)/Stationarity Test

In statistics, a **unit root** test tests whether a time series variable is non-stationary and possesses a unit root. The null hypothesis is generally defined as the presence of a unit root and the alternative hypothesis is either stationarity, trend stationarity or explosive root depending on the test used. These tests are known for having low statistical power. Many tests exist, in part, because none stand out as having the *most* power. Tests include:

The **Dickey Fuller Test** (sometimes called a Dickey Pantula test), which is based on linear regression. Serial correlation can be an issue, in which case the **Augmented Dickey-Fuller (ADF) test** can be used. The ADF handles bigger, more complex models. It does have the downside of a fairly high Type I error rate.

MIDCAP (Constant Model)

Null Hypothesis: MIDCAP has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=26)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			0.231277	0.9745
Test critical values:	1% level		-3.432808	
	5% level		-2.862512	
	10% level		-2.567332	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MIDCAP)				
Method: Least Squares				
Date: 06/14/18 Time: 13:13				
Sample (adjusted): 5/28/2008 5/25/2018				
Included observations: 2466 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
MIDCAP(-1)	0.000126	0.000544	0.231277	0.8171
D(MIDCAP(-1))	0.129640	0.020025	6.473835	0.0000
C	3.065040	6.057233	0.506013	0.6129

R-squared	0.016812	Mean dependent var	4.973783
Adjusted R-squared	0.016014	S.D. dependent var	120.5314
S.E. of regression	119.5624	Akaike info criterion	12.40677
Sum squared resid	35208993	Schwarz criterion	12.41384
Log likelihood	-15294.55	Hannan-Quinn criter.	12.40934
F-statistic	21.05784	Durbin-Watson stat	1.998484
Prob(F-statistic)	0.000000		

Interpretation

Validity

- Here this model is value if the coefficient value of the Midcap is a negative
- We got Midcap coefficient value is **0.0001** hence the test is **not viable**

MIDCAP (linear trend &Constant Model) [Table: 13]

Null Hypothesis: MIDCAP has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=26)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-2.140844	0.5221
Test critical values:	1% level		-3.961766	
	5% level		-3.411630	
	10% level		-3.127687	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MIDCAP)				
Method: Least Squares				
Date: 06/12/18 Time: 15:02				
Sample (adjusted): 5/28/2008 5/25/2018				
Included observations: 2466 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
MIDCAP(-1)	-0.002768	0.001293	-2.140844	0.0324
D(MIDCAP(-1))	0.130150	0.020006	6.505634	0.0000
C	8.156132	6.393327	1.275726	0.2022
@TREND("5/26/2008)	0.019835	0.008041	2.466603	0.0137

R-squared	0.019236	Mean dependent var	4.973783
Adjusted R-squared	0.018040	S.D. dependent var	120.5314
S.E. of regression	119.4392	Akaike info criterion	12.40511
Sum squared resid	35122198	Schwarz criterion	12.41454
Log likelihood	-15291.50	Hannan-Quinn criter.	12.40854
F-statistic	16.09558	Durbin-Watson stat	1.998676
Prob(F-statistic)	0.000000		

Interpretation

Validity

- Here this model is value if the coefficient value of the Midcap is a negative
- We got Midcap coefficient value is **-0.0027** hence the test is **viable**

Hypothesis

H_0: Midcap has a unit root meaning that variable is not stationary

H_1: Midcap has not a unit root meaning that variable is stationary

T-Statistic

If the **absolute test statistics** is more than the **absolute critical value** then we can **reject null hypothesis** and accept alternative hypothesis. But if the test statistics is less than the critical value, we cannot reject null hypothesis. Rather we accept null hypothesis. (Here Absolute value means Ignore the minus sign)

Absolute test statistics > Absolute critical value : REJECT THE NULL HYPOTHESIS
At 1% Level : 2.1408 > 3.9617 : ACCEPT THE NULL HYPOTHESIS
At 5% Level : 2.1408 > 3.4116 : ACCEPT THE NULL HYPOTHESIS
At 10% Level : 2.1408 > 3.1276 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_1: Midcap has a unit root meaning that variable is non-stationary

P value

If the **P value is less than 5%** we can reject null hypothesis and accept alternative hypothesis. But If the P value is more than 5% we cannot reject null hypothesis, rather we accept null hypothesis.

P value<0.05 : REJECT THE NULL HYPOTHESIS
0.5221 < 0.05 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: Midcap has a unit root meaning that variable is not stationary

USD/INR (Constant Model)

Null Hypothesis: USD_INR has a unit root				
Exogenous: Constant				
Lag Length: 2 (Automatic - based on SIC, maxlag=26)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-1.050313	0.7370
Test critical values:	1% level		-3.432809	
	5% level		-2.862512	
	10% level		-2.567333	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(USD_INR)				
Method: Least Squares				
Date: 06/12/18 Time: 15:05				
Sample (adjusted): 5/29/2008 5/25/2018				
Included observations: 2465 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
USD_INR(-1)	-0.000715	0.000681	-1.050313	0.2937
D(USD_INR(-1))	0.030576	0.020102	1.521041	0.1284
D(USD_INR(-2))	-0.082806	0.020099	-4.119914	0.0000
C	0.051015	0.038779	1.315558	0.1884

R-squared	0.008118	Mean dependent var	0.010178
Adjusted R-squared	0.006909	S.D. dependent var	0.285319
S.E. of regression	0.284332	Akaike info criterion	0.324270
Sum squared resid	198.9581	Schwarz criterion	0.333697
Log likelihood	-395.6623	Hannan-Quinn criter.	0.327695
F-statistic	6.714259	Durbin-Watson stat	2.000346
Prob(F-statistic)	0.000165		

Interpretation

Validity

- Here this model is value if the coefficient value of the USD/INR is a negative
- We got USD/INR coefficient value is **-0.0007** hence the test is **viable**

Hypothesis

H_0: USD/INR has a unit root meaning that variable is not stationary

H_1: USD/INR has not a unit root meaning that variable is stationary

T-Statistic

If the **absolute test statistics** is more than the **absolute critical value** then we can **reject null hypothesis** and accept alternative hypothesis. But if the test statistics is less than the critical value, we cannot reject null hypothesis. Rather we accept null hypothesis. (Here Absolute value means Ignore the minus sign)

Absolute test statistics > Absolute critical value : REJECT THE NULL HYPOTHESIS

At 1% Level : 1.0503 > 3.4328 : ACCEPT THE NULL HYPOTHESIS

At 5% Level : 1.0503 > 2.8625 : ACCEPT THE NULL HYPOTHESIS

At 10% Level : 1.0503 > 2.5673 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: USD/INRhas a unit root meaning that variable is not stationary

P value

If the **P value is less than 5%** we can reject null hypothesis and accept alternative hypothesis. But If the P value is more than 5% we cannot reject null hypothesis, rather we accept null hypothesis.

P value<0.05 : REJECT THE NULL HYPOTHESIS

0.7370 < 0.05 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: USD/INR has a unit root meaning that variable is not stationary

USD/INR (linear trend & Constant Model)

Null Hypothesis: USD_INR has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 2 (Automatic - based on SIC, maxlag=26)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-2.053163	0.5712
Test critical values:	1% level		-3.961767	
	5% level		-3.411631	
	10% level		-3.127688	
*MacKinnon (1996) one-sided p-values.				

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(USD_INR)				
Method: Least Squares				
Date: 06/12/18 Time: 15:06				
Sample (adjusted): 5/29/2008 5/25/2018				
Included observations: 2465 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
USD_INR(-1)	-0.003688	0.001796	-2.053163	0.0402
D(USD_INR(-1))	0.032082	0.020110	1.595313	0.1108
D(USD_INR(-2))	-0.081210	0.020110	-4.038287	0.0001
C	0.171550	0.077751	2.206416	0.0274
@TREND("5/26/2008)	3.796641	2.122978	1.788357	0.0738

R-squared	0.009406	Mean dependent var	0.010178
Adjusted R-squared	0.007795	S.D. dependent var	0.285319
S.E. of regression	0.284205	Akaike info criterion	0.323782
Sum squared resid	198.6998	Schwarz criterion	0.335567
Log likelihood	-394.0609	Hannan-Quinn criter.	0.328063
F-statistic	5.839747	Durbin-Watson stat	1.999982
Prob(F-statistic)	0.000112		

Interpretation

Validity

- Here this model is value if the coefficient value of the USD/INR is a negative
- We got USD/INR coefficient value is **-0.0036** hence the test is **viable**

Hypothesis

H_0: USD/INR has a unit root meaning that variable is not stationary

H_1: USD/INR has not a unit root meaning that variable is stationary

T-Statistic

If the **absolute test statistics** is more than the **absolute critical value** then we can **reject null hypothesis** and accept alternative hypothesis. But if the test statistics is less than the critical value, we cannot reject null hypothesis. Rather we accept null hypothesis. (Here Absolute value means Ignore the minus sign)

Absolute test statistics > Absolute critical value : REJECT THE NULL HYPOTHESIS

At 1% Level : 2.05316 > 3.9617 : ACCEPT THE NULL HYPOTHESIS

At 5% Level : 2.05316 > 3.4116 : ACCEPT THE NULL HYPOTHESIS

At 10% Level : 2.5316 > 3.1276 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: USD/INRhas a unit root meaning that variable is not stationary

P value

If the **P value is less than 5%** we can reject null hypothesis and accept alternative hypothesis. But If the P value is more than 5% we cannot reject null hypothesis, rather we accept null hypothesis.

P value<0.05 : REJECT THE NULL HYPOTHESIS

0.5712 < 0.05 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: USD/INR has a unit root meaning that variable is not stationary

Granger Causality Test

Granger causality is a way to investigate **causality** between two variables in a time series. The method is a probabilistic account of causality; it uses empirical data sets to find patterns of correlation.

Causality is closely related to the idea of cause-and-effect, although it isn't exactly the same. A variable X is causal to variable Y if X is the cause of Y *or* Y is the cause of X. However, with Granger causality, you aren't testing a true cause-and-effect relationship; What you want to know is if **a particular variable comes before another** in the time series. In other words, if you find Granger causality in your data there isn't a causal link in the true sense of the word (for example, sales of Easter baskets Granger-cause Easter!). **Note**: When econometricians say "cause," what they mean is "Granger-cause," although a more appropriate word might be "precedence" (Leamer, 1985).

USD/INR Causes Midcap?

Pairwise Granger Causality Tests			
Date: 06/15/18 Time: 11:57			
Sample: 5/26/2008 5/25/2018			
Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
DUSD_INR does not Granger Cause DMIDCAP	2465	12.8832	2.7164

Interpretation

Hypothesis

H_0: USD/INR does not Granger Cause MIDCAP

H_1: USD/INR does Granger Cause MIDCAP

F-Statistic & P value

If the **P value is less than 5%** we can reject null hypothesis and accept alternative hypothesis. But If the P value is more than 5% we cannot reject null hypothesis, rather we accept null hypothesis.

P value<0.05 : REJECT THE NULL HYPOTHESIS

2.7164 < 0.05 : ACCEPT THE NULL HYPOTHESIS

Hence, we Accept the Null Hypothesis that…

H_0: USD/INR does not Granger Cause MIDCAP

Hypothesis Test Summary

Name of Test	Applied on	Significance Value	Decision	Outcome
Correlation	MIDCAP / USD	0.000	H0 Rejected	There is significant relation between NIFTY and USD/INR.
Regression	MIDCAP / USD	0.000	H0 Rejected	There is significance impact of USD/INR on MIDCAP
Unit Root Test	MIDCAP (Constant Model)	0.9745	H0 Accepted	MIDCAP has a unit root meaning that variable is not stationary
	MIDCAP (Linear Trend & Constant Model)	0.5221	H0 Accepted	MIDCAP has a unit root meaning that variable is not stationary
	USD/INR (Constant Model)	0.7370	H0 Accepted	USD/INR has a unit root meaning that variable is not stationary
	USD/INR (Linear Trend & Constant Model)	0.5712	H0 Accepted	USD/INR has a unit root meaning that variable is not stationary
Granger Causality Test	USD Causes MIDCAP?	2.7164	H0 Accepted	USD/INR does not granger cause MIDCAP

Findings

We found that there is no significant impact of currency exchange rate of USD/INR on MIDCAP and it ignores such impact of currency exchange rate.

Based on past last 10 years data of currency exchange and stock market indices, The Correlation between USD/INR exchange rate and Stock market indices such as MIDCAP is 74.6% represent that USD/INR rate is likely related to Indian stock market indices and for economy of our country

With rates of currency fluctuating every now and then, import and export of a country gets hugely affected. Like if Indian currency's value in the global market appreciates then government will have more purchasing power which gives power to be productive enough to export the commodities and generate volumes there from.

Rupee's value in the global market appreciates or depreciates because of the following reasons:

- Difference in Interest Rates
- Difference in Inflation rates of economies
- Export Import; and
- Trading in currencies in the forex market

Rupee's appreciation or depreciation impacts following:

- Economy
- Foreign Investors; and
- Industry/ Companies

Conclusion

The purpose of the research question was to identify the dynamic volatility relation from exchange rate to the Indian stock market indices. As we mentioned earlier that this purpose of the study is to create a better understanding and performance of the investors while diversifying their portfolios locally or hedging their risk internationally. Thus, we served our purpose by figuring out the relation and increasing the knowledge of the investors. Empirical investigation shows that volatility spillover effect exists in each chosen Indian economic sector over the 10 years period for both USD and INR exchange rate. Therefore, the investors should act accordingly. Our recommended act from this study, that during the volatile stock market indices the investors should diversify their portfolios domestically and in case of stable stock market indices, investors may have international diversification.

In conclusion we can say that *Yes, there is impact from changes in US Dollar and INR exchange rates on the performance of Indian Stocks.* Thus, we fulfilled our purpose by answering our research question.

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