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Performance of Financial Derivatives (Futures) in Indian Capital Market

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Abstract--- Any country’s economy performance is partly based on the strength and success of Financial or capital markets. The important financial markets which are responsible for the development of any country’s economy includes capital market consisting of stock market and bond market, commodity market, money market, derivatives market, Insurance market and foreign exchange market. In the last few years, a series of widely publicized

losses related to derivatives activities has focused public attention on derivatives risks. Since the introduction of derivatives in India there has been tremendous growth along with this the risk factor on trading is also growing the market. With the assessment of financial derivatives it is concluded that these markets contributed a lot in managing the economic and financial risks. This study focuses and analyzes the

role of financial derivatives in the Indian Capital Market. The efforts are also made by the researchers to test its impact on Indian Capital Market.

Keywords--- Financial Derivatives, Risk Management, Exchange rates ,capital markets.

I. INTRODUCTION

Derivatives provide an effective solution to the problem of risk caused by uncertainty and volatility in underlying asset. Derivatives are risk management tools that help an organization to effectively transfer risk. Derivatives are instruments which have no independent value. Their value depends upon the underlying asset. The underlying asset may be financial or non-financial. Financial derivatives are used for a number of purposes including risk management, hedging, arbitrage between markets, and speculation. A security whose price is dependent upon or derived from one or more underlying assets. The derivative itself is merely a contract between two or more parties. Its value is determined by fluctuations in the underlying asset. The participants in the derivatives market are Hedgers, Speculators and arbitrageurs. Due to growing volatility in the global financial markets, financial derivatives came into the limelight in the post 1970 period

In India, products have become very popular and since the 1990s, they account for about derivatives trading started in June 2000 with the introduction of Index future followed by index options in June 2001, and options and futures on individual securities in July 2001 and November 2001, respectively. Since inception, National Stock Exchange of India (NSE) established itself as the sole market leader In this segment in the country and during 2008-09, it accounted for 99 % of the Market share (NSE, 2009). The total turnover on the F&O Segment was Rs. 11,010,482 crore (US \$ 2,161,037 million) during 2008- 09. The average daily turnover during 2008-09 was Rs.45, 311 crore (US \$ 8,893 million).

II. LITERATURE REVIEW

Number of diverse literature exists on the subject relating to the impact of index futures and stock options on the underlying stock market with respect to developed countries. This study contributes to the existing literature on the fact that effects of stock index futures have been considered. Gahlot Ruchika, Datta Saroj K. Kapil Sheeba. (2010) , examined the impact of derivative trading on stock market volatility of S&P CNX Nifty. Debasish Sathya Swaroop. (2009), investigated the effect of futures trading on the volatility and operating efficiency of the underlying Indian stock market and resulted in reduced trading efficiency in the underlying stock market. Maniar Hiren M. (2009) analyzed the effect of the introduction of derivatives (futures and options) in the Indian market on the volatility. Debashis. (2008), studied the effect of future trading on volatility & operating efficiency of the underlying Indian stock market .Debashis. (2008) did another study to discover the effect of future trading activity on the jump volatility of stock market by taking case of NSE Nifty stock index by using multivariate Granger causality modeling technique and found that future trading was not force behind episodes of jump volatility. Mallikarjunappa and Afsal. (2008), also studied the effect of future trading on spot market volatility by using GARCH model on CNX Bank Nifty and result that there is no impact of future trading on spot market volatility. Sabri (2008) explored the impact of change in trade volume on volatility of stock prices as expressed by unified Arab Monetary fund stock price index. . He also found the correlation between volume and price movement was higher in the stock markets of the oil Arab states compared to the nonoil Arab states. Drimbetas et al. (2007) examined the effect of introduction of future & options into the FTSE/ASE 20 Index on the volatility of underlying index by using EGARCH model. He found reduction in the conditional volatility of index and consequently increases its efficiency. Alexakis. (2007), used GJR-GARCH model to find out the effect of introduction of stock index future on the volatility of spot equity market and found that the introduction of future contract had not had a detrimental effect on underling spot market. Samantha and Samantha. (2007), analyzed the impact of introducing index futures and stock future on the volatility of underlying spot market in India. He found that there is no significant change in the volatility of spot market. Robbani and Bhuyan. (2005) used the GARCH model to examine the effect

of introduction of future & option on the DJIA on the volatility & trading volume of its underlying stocks and found that level of volatility and trading volume increased after introduction of future & option on the index. Kim (2004) investigated the relationship between trading activities of the Korea Stock Price Index. He found positive relationship between stock market volatility and derivative volume while the relationship is negative between volatility open interests. Nath Golaka C. (2003), his paper on "Behaviour of Stock Market Volatility after Derivatives", examined the behaviour of volatility in equity market in pre and post derivatives period in India. Stewart Mayhew (2000), had studied on more comprehensive review of the other derivatives. An extensive review was done by Obiyatullah Ismath Bacha in 1999 regarding the evolution of modern financial derivatives. Aggarwal (1988) and Edwards (1988a) studied post and pre index futures commencement data and reported a decrease in volatility as measured by the variance of daily returns. Edwin et al (1989) observes increased volatility after the introduction of index futures by comparing daily return volatilities during the pre-index futures introduction and post-index futures introduction for S&P 500 between bull and bear markets.

III. OBJECTIVES

- 1 To study the relationship between future Index Nifty (Financial Derivatives) and S&P CNX Nifty (Capital Market).
2. To examine the performance of financial derivatives in the Indian Capital Market.

IV. HYPOTHESES

Testing the impact of Financial Derivatives on Indian Capital Market.

H0 : Financial Derivatives has no significant impact on the Indian Capital Market.

H1 : Financial Derivatives has significant impact on the Indian Capital Market

Testing the relationship of Future Index Bank Nifty with S&P CNX Nifty.

H0 : There is no relation between the movements of Future Index Bank Nifty with S&P CNX Nifty.

H2 : There is a relation between the movements of Future Index Bank Nifty with S&P

Testing the relationship of Future Index CNX100 with S&P CNX Nifty.

H0 : There is no relation between the movements of Future Index CNX100 with S&P CNX Nifty.

H3 : There is a relation between the movements of Future Index CNX100 with S&P

V. DATA COLLECTION METHOD

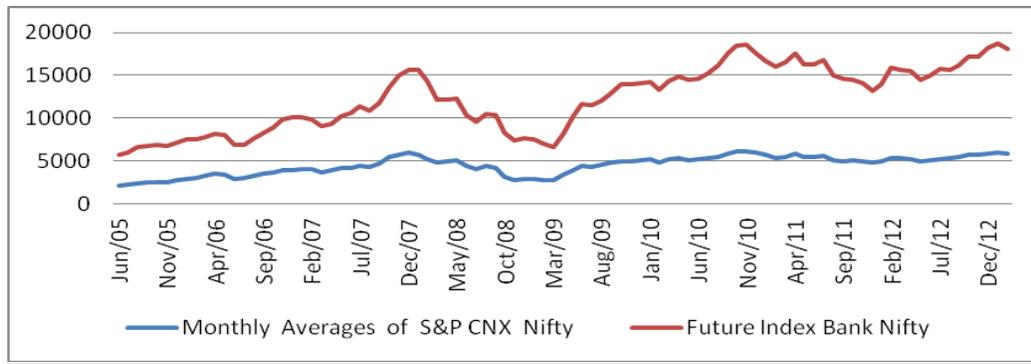
The data analyzed in this paper has been collected from the related source i.e. NSE India (www.nseindia.com). The sample consists of monthly average of stock indices of NSE (i.e. S&P CNX Nifty) and indices of derivatives i.e. (Future Index Nifty) in India from 1st April 2000 to Feb 2013. The collected data is then compiled in the form of tables and graphs and scrutinized through statistical tools and tables

VI. RESULTS AND DISCUSSIONS

FUTURE INDEX BANK NIFTY VS S&P CNX NIFTY

For studying the impact of Future index Bank nifty on S & P CNX Nifty, monthly averages of both the indices are calculated.

Graph (1) the shows trend of future index bank nifty and S&P CNX Nifty. They are low correlated as the index bank nifty rises with the rise of the S&P CNX nifty and falls with the fall of S&P CNX Nifty. It is seen that two parallel lines have a same variation in between which show that there is significant impact of Bank Nifty and S & P CNX Nifty.



On X axis- months

on Y axis- monthly averages

GRAPH:1

GRAPHICAL REPRESENTATION OF CORRELATION BETWEEN S&P CNX NIFTY AND FUTURE INDEX BANK NIFTY

DESCRIPTIVE STATISTICS

TABLE:1 (A)

Calculation of mean and standard deviation for monthly averages of s&p cnx nifty and future index bank nifty

	MEAN	ST.DEVIATION	N
S&P CNX NIFTY	3.9674E3	1000.20137	93
FUTURE INDEX BANK NIFTY	6.1631E3	1813.81088	93

TABLE:1 (B)

Model summary of s&p cnx nifty and future index bank nifty

MODEL	R	R SQUARE	ADJUSTED R SQUARE	ST.ERROR OF THE ESTIMATE
1	.954	.910	.900	321.71971

INTERPRETATION

Table:1(B) shows the correlation (r) between the future index bank nifty and S&P CNX Nifty. The coefficient of determination (r²) is at 0.910 which implies that 91.0% of the variance is explained by this relationship.

Table:1(C)

Karl pearson's product moment correlation coefficient of s&p cnx nifty and future index bank nifty

		S&p cnx nifty
Pearson coefficient	Future index bank nifty	.954
Sign.(1 tailed)	Future index bank nifty	.000
N	Future index bank nifty	93

INTERPRETATION

Table:1(C) examines the relationship between future index Bank Nifty and S&P CNX Nifty that gives the coefficient of correlation at 0.954 which is a low degree of correlation. The significant value is 0.00 which is not more than the critical value i.e., 0.05 which shows that Future Index have a significant impact on S&P CNX Nifty

TABLE:1(D)

REGRESSION ANALYSIS OF S&P CNX NIFTY ON FUTURE INDEX BANK NIFTY

MODEL	UNSTANDARDISED COEFFICIENTS		STANDARDISED	T	Sign.
	B	St.error	Beta		
Constant	739.158	152.898		8.971	0.000
Future index bank nifty	.523	.023	.954	26.562	0.000

CONSTANT: S&P CNX NIFTY (through SPSS)

INTERPRETATION

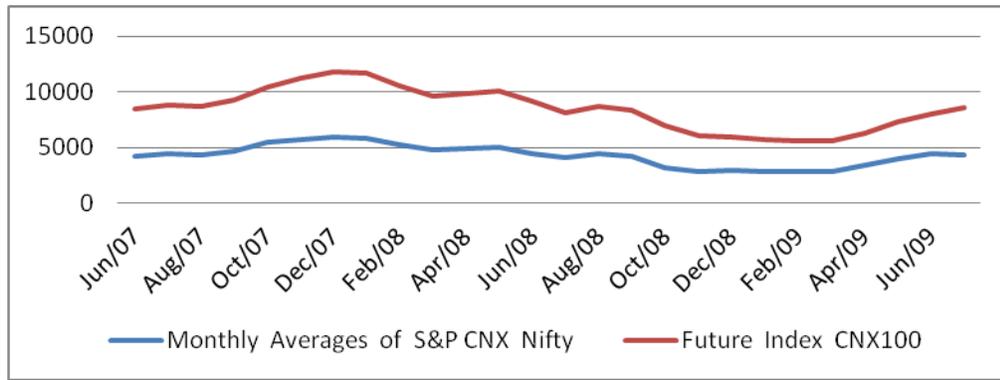
Table 1(D) highlights that there is no linear relationship between the variables analyzed. It is observed that the value of future index Bank Nifty is 0.523 which means that for every unit change future index Bank Nifty the value of S&P CNX Nifty is moved by 0.055 that is extremely low. On the other hand, the intercept is very high that is 735.158 indicating the role of other factors in the movement of S&P CNX Nifty. It means that if the value of future index Bank Nifty is zero then the value of NSE or S&P CNX Nifty would be affected by 735.158 units. The sig. value is calculated at 0.0 which is lesser than the critical value of 0.05. So, it shows that there is significant impact of Bank Nifty on movement of S&P CNX Nifty.

FUTURE INDEX CNX 100 VS S&P CNX NIFTY

For studying the impact of Future index CNX 100 on S & P CNX Nifty, monthly averages of both the indices are calculated

GRAPH:2

GRAPHICAL REPRESENTATION OF CORRELATION BETWEEN S&P CNX NIFTY AND FUTURE INDEX CNX 100



On X axis- months

on Yaxis-monthly averages

INTERPRETATION

In Graph (2) it can be seen that there is a correlation b/w the future index CNX100 and S&P CNX Nifty as the index of CNX 100 rises with the rise of the S&P CNX Nifty and falls with the fall of S&P CNX Nifty. It is also seen that the two lines are having a gap in between which shows that the future index have significant impact on NSE and they are highly correlated to each other

DESCRIPTIVE STATISTICS

TABLE:2(A)

CALCULATION OF MEAN AND STANDARD DEVIATION FOR MONTHLY AVERAGES OF S&P CNX NIFTY AND FUTURE INDEX CNX 100

	Mean	St.deviation	N
S&P CNX NIFTY	4.2773E3	966.17421	26
FUTURE INDEX CNX 100	4.1924E3	948.55425	26

N=Sample size (number of months from June 2007 to July 2009)

TABLE:2(B)

MODEL SUMMARY OF S&P CNX NIFTY AND FUTURE INDEX CNX 100

MODEL	R	R SQUARE	ADJUSTED R SQUARE	ST.ERROR OF THE ESTIMATE
1	0.953	.908	.904	299.39564

CONSTANT:FUTURE INDEX CNX 100

INTERPRETATION

Table: 2(B) shows the correlation (r) between the future index CNX 100 and S&P CNX Nifty. The coefficient of determination (r²) is at 0.908 which implies that 90.8% of the variance is explained by this relationship.

TABLE:2(C)

Karl pearson's product moment correlation coefficient of s&p cnx nifty and future index cnx 100

		S&P CNX NIFTY
PEARSON COEFFICIENT	Future index CNX 100	.953
SIGN.(1 tailed)	Future index CNX 100	0.00
N	Future index CNX 100	26

INTERPRETATION

Table:2 (C) examines the relationship between Future Index CNX 100 and S&P CNX Nifty that gives the coefficient of correlation at 0.953 which is a high degree of correlation. The significant value is 0.00 which is lesser than the critical value i.e., 0.05 which shows that Future Index CNX 100 have significant impact on S&P CNX Nifty.

TABLE:2(D)

REGRESSION ANALYSIS OF S&P CNX NIFTY ON CNX 100

Model	UNSTANDARDISED COEFFICIENTS		STANDARDISED	T	Sign.
	B	ST.ERROR	BETA		
Constant	208.613	271.088		0.770	.449
Future index CNX 100	.970	0.063	.953	15.374	.000

DEPENDENT VARIABLE: S&P CNX NIFTY (through SPSS)

INTERPRETATION

Table:2 (D) highlights that there is no linear relationship between the variables analyzed. It is observed that the value of future index CNX 100 is 0.970 which means that for every unit change future index CNX 100 the value of S&P CNX Nifty is moved by 0.055 that is extremely low. On the other hand, the intercept is very high that is 208.613 indicating the role of other factors in the movement of Nifty. It means that if the value of future index CNX 100 is zero then the value of NSE or S&P CNX Nifty would be affected by 208.613 units. The sig. Value is calculated at 0.001 which is less than the critical value of 0.05. So, it shows that there is an impact of Future Index CNX 100 on movement of S&P CNX Nifty.

VII. FINDINGS AND CONCLUSIONS

To test the impact of Financial Derivatives, study uses the modes and operations of correlation and regression between Future Index Nifty with S&P CNX Nifty Index on Indian Capital Market. For this purpose, the relationship between two variables viz; Future Index Bank nifty and S&P CNX Nifty and Future index CNX 100 on S & P CNX Nifty have been examined.

In order to examine the result, Correlation and Regression is being calculated in this study and t-test is being used here to test the statistical significance of the results for which Correlation and regression is being calculated in order to analyze the result and t-test is being employed here in order to test the statistical significance of the results calculated which is showed in Tables

In Table 1(b) and Table- 1(c) Karl- Pearson's Product Moment Correlation is being calculated which is a simple correlation and explain the relationship between one dependent variable and one independent variable. For computation purpose, Future Index Bank Nifty, Future Index CNX 100 are taken as an independent variable and S&P CNX Nifty is being taken as dependent variables one by one. It highlights the coefficient of correlation, coefficient of determination and significance level between future index nifty and S&P CNX Nifty.

According to the results showed in Table 1(b) and Table1(c) during the years from 2000 to 2013 it is found that the correlation between Future bank index nifty and S&P CNX Nifty is 0.954 that indicates a high degree of positive correlation. The coefficient of determination is at 0.910 that signifies that

91.0% of the variance in the variables is explained by this relationship. The value at 5% significance level is calculated as 0.000, which lies within the critical values of t at 0.05. Hence the value is less than the critical value.

According to the results showed in Table 2(b) and Table 2(c) from 2000 to 2013 The correlation value of Future Index Bank Nifty, Future Index CNX 100 are , 0.954, 0.953 indicates a high degree of positive correlation. The coefficient of determination is at which signifies that 91.0%, 90.8% of the variance in the variables is explained by this relationship. The value at 5% significance level is calculated as 0.000, and 0.05 which lies within the critical values of t at 0.05 which shows the impact of Index Futures on Indian Capital Market.

Table 1(D) highlights that there is no linear relationship between the variables analyzed. It is observed that the value of future index Bank Nifty is 0.523 which means that for every unit change future index Bank Nifty the value of S&P CNX Nifty is moved by 0.055 that is extremely low. On the other hand, the intercept is very high that is 735.158 indicating the role of other factors in the movement of S&P CNX Nifty. It means that if the value of future index Bank Nifty is zero then the value of NSE or S&P CNX Nifty would be affected by 735.158 units. The sig. value is calculated at 0.0 which is lesser than the critical value of 0.05. So, it shows that there is significant impact of Bank Nifty on movement of S&P CNX Nifty.

The impact of Future Index bank nifty on the movement of S&P CNX Nifty is very low and it is not much affected by it. The

significance value is calculated as 0.000, which is less than the critical value of 0.05. It leads to acceptance of the Alternative Hypothesis and rejection of the Null Hypothesis. Hence there is an impact of the future index on the movement of the (NSE index) S&P CNX Nifty which leads to acceptance of the Alternative Hypothesis and rejection of the Null Hypothesis. Hence there is a relation between Future Index and S&P CNX Nifty and future index has a significant impact on the movement of (NSE index) S&P CNX Nifty.

The above discussion implies that future index have a significant impact on the Indices of the stock exchange NSE. Graphical Analysis above also signifies that There is a significant relationship between the two variables (used in this study). It is hence observed that with every movement in future index bank nifty there is an instant reaction in the Indian Capital Market that makes it impossible for any investor to earn abnormal return. This leads to the acceptance of the second Alternative Hypothesis that there is a relationship between the movement of Indian Capital Market and financial derivatives market and the Null Hypothesis that there is no relationship between the moment of future index Nifty and Indian Capital Market is being rejected.

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