

Impact of Future Price on Spot Price of Indian Stock Market

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ABSTRACT

This paper examines the impact of future trading on spot price volatility by using regression Analysis. The main objective of this paper is to investigate whether the existence of future markets in India has improved the rate at which new information is impounded into spot prices and have any persistence effect. The results gathered from the study indicate that even though it has been in operation for a short period of time, the futures market in India has significantly increased the rate at which new information is transmitted into spot prices and that it has reduced the persistence of information and volatility in underlying spot market resulting in improved efficiency. The results of this study have also some important implications for policy makers discussed in the final section of this paper.

Keywords-- Derivatives Market, Future Price, Spot Market, Regression Analysis

introduction of future trading as compared to the developed nations, with which the country has been trying to integrate, is market. According to some researcher future trading may leads to inefficiency in stock market. The rejection of weak form efficiency will enable investor to predict future price on the basis of past prices through technical analysis to earn abnormal profit. The inefficiency of stock market will help regulators and authorities to determine the best way to influence stock prices, reduce volatility and evaluate the consequences of different economic policies.

II. LITERATURE REVIEW

Alok Kumar Mishra, et al., (2007) Discussed in their research of volatility spill overs provides useful insights into how information was transmitted from stock market to foreign exchange market and vice versa. This study explores volatility spill overs between the Indian stock and foreign exchange markets. The results indicate that there exists a bidirectional volatility spillover between the Indian stock market and the foreign exchange market with the exception of S&P CNX NIFTY and S&P CNX 500. The findings of the study also suggest that both the markets move in tandem with each other and there was a long run relationship between these two markets. The results of significant bidirectional volatility spill over suggest that there was an information flow (transmission) between these two markets and both these markets were integrated with each other. Accordingly, financial managers can obtain more insights in the management of their international portfolio affected by these two variables. This should be particularly important to domestic as well as international investors for hedging and diversifying their portfolio.

Ravi Singla, (2008) Identified in the research that the effect of derivatives trading on the volatility of underlying spot market had always remained a topic of empirical interest. Yet the literature was still in conclusive on the issue that whether the introduction of derivatives trading increases or decreases the volatility in the underlying cash market. Theoretically, a number of arguments had been given supporting both of these views. On the one side it was argued that the introduction of derivatives trading brings in new investors, improves liquidity in the market, increases information flows, provides more investment choices, leads to better price

I. INTRODUCTION

The Indian stock market is affected by many macroeconomics factors like, inflation rate, interest rate, economic trend in foreign market, foreign investment, government policy and derivatives market. Also expanded use of derivatives has promoted expression of alarm from some legislator and regulators and the member of the press about the risks this new global activity poses to cooperation's global capital market and overall economic. The popular press has also dealt with derivatives market by reporting the risks cause by derivatives trading and the regulation of derivatives market. So, there is need to examine the impact of derivatives on stock market. The main purpose of introducing derivatives trading was to enable investors to hedge the risk. But most of the investors are using derivative trading for speculation and arbitrage to earn profit which affects the behavior of stock market. The impact of future and options on the stock market are still not clear. So, it becomes necessary to study the impact of derivatives on Indian stock market.

The problem under study is, "A study on future price impact on spot price of Indian stock market" The speculator growth of the derivative market has brought forth the question of the impact of future trading on efficiency of the stock markets in India and where stock market of India stands in term of stability after

discovery and thereby reduces volatility. On the other hand, it was also the viewpoint of many financial experts that allowing derivatives trading invites huge participation from speculative investors, leads to excessive leveraged positions and thereby increases volatility in the underlying spot market. The present research compares the volatility in the periods of pre and post introduction of index derivative contracts by computing the rolling standard deviations and the variances in the daily return data of S&P CNX Nifty Index over different period event windows.

Aisyah Abdul Rahman, et al., (2009)

Divulged in their research that the interactions between selected macro-economic variables and stock prices for the case of Malaysia in a VAR framework. Some conventional econometric techniques were applied along with a battery of complementary tests to trace out both short and long run dynamics. Upon testing a vector error Correction model, they show that changes in Malaysian stock market index do perform a cointegrating relationship with changes in money supply, interest rate, exchange rate, reserves and industrial production index. Our lag exclusion test shows that all six variables contribute significantly to the co-integrating relationship. This shows that the Malaysian stock market was sensitive to changes in the macroeconomic variables. Furthermore, based on the variance decomposition analysis, this study highlights that Malaysian stock market had stronger dynamic interaction with reserves and industrial production index as compared to money supply, interest rate and exchange rate.

Gaurav Agrawal, et al., (2010) Determined in their research that the relationship between Nifty returns and Indian rupee-US Dollar Exchange Rates. Several statistical tests had been applied in order to study the behavior and dynamics of both the series. The study also investigates the impact of both the time series on each other. The period for the study had been taken from October 2007 to March 2009 using daily closing indices. In this study, it was found that Nifty returns as well as Exchange Rates were non-normally distributed. Through unit root test, it was also established that the time series, Exchange rate and Nifty returns, were stationary at the level form itself. Correlation between Nifty returns and Exchange Rates was found to be negative. Further investigation into the causal relationship between the two variables using Granger Causality test highlighted unidirectional relationship between Nifty returns and Exchange Rates, running from the former towards the latter.

Sathya Swaroop Debasish, (2011) Divulged In their research the change, if any, in the volatility observed in the Indian stock market due to the introduction of futures trading. The change in the volatility was compared in terms of the structure of the volatility. This was done to give insights in to the way the futures market was influencing the Indian spot market's volatility. The main objective of the study was to investigate whether there had been significant change in relative

volatility of the underlying spot return and futures return. The period of study was from 1st January 2000 to 31st December 2010 for the prices. The study used three stock indices of NSE namely Nifty, CNX IT and CNX Bank. The index futures time series analyzed here uses data on the near month contract as they were most heavily traded. The study had used four measures of volatility. The study finds that for the three NSE indices, the study rejects the null hypothesis of 'no significant change in relative inter-day volatility between spot prices and futures prices' over the entire period 2000-2010, but cannot reject the hypothesis fully for all the individual years.

III. SCOPE OF STUDY

The derivatives market is developing segment which affect the stock market in number of ways. The derivatives market consists of number of instruments like, stock future, index future, stock option, index option and interest rate future. As the stock future is largely traded instrument, the study confines itself to stock futures trading which will help to compare the impact of future trading on different sectors. The scope of the study is limited to impact of stock futures trading on two aspect of Indian stock market: efficiency of stock market and volatility of stock market. Since NSE is the major contributor of the derivatives market, top 10 securities of major sectors listed on NSE/BSE and having futures trading has been taken to represent the Indian stock market. This study is based on the secondary source of data collection. It uses daily closing prices of the securities. All these data regarding the closing prices have been gathered mainly from the secondary sources, NSE/BSE website being the most significance one.

IV. SIGNIFICANT OF STUDY

Derivatives are introduced for the purpose of the hedging risks involved in financial transaction. But investors are using derivatives instruments for the purpose of earning extra profit. The presence of derivatives trading affects the stability of the stock market as it creates volatility and inefficiency in the market. So, it becomes necessary for the regulator to study impact of derivatives trading on stock market behavior. This study will help regulator to form appropriate policies as market would have to pay a certain price, such as a loss of market efficiency for the sake of market stabilization. This research will help regulator to take decision in case derivatives trading adversely affect stock market because there may be need for increasing the regulation of these markets. However, if the introduction of derivatives is found to cause stabilization, it may be strongly suggested to regulator to liberalize the regulation of the derivatives market. Understanding the impact of derivatives trading on behavior of stock market is important to investors who seek to find whether the opportunity of making excess

return dose exist in stock market. This study will also help investors to make investment decision and their knowledge of the existence of inefficiency and volatility would be very useful for developing investment strategies.

V. OBJECTIVE OF STUDY

To investigate the impact of future price on spot price.

To analyze the significant relationship between spot price and future price.

VI. RESEARCH DESIGN

The Description is used for frequencies, averages and other statistical calculation. Often the best approach, prior to writing descriptive research, is to conduct a survey investigation. Qualitative research often has the aim of description and researchers may follow-up with examinations of why the observations exist and what the implication of the findings are. In short **descriptive research** deals with everything that can be counted and studies.

VII. DATA ANALYSIS

For measuring relationship between future price and spot price, 5 scripts are selected i.e. Reliance, SBI, HDFC, ICICI, TCS.

	Correlation between
Spot	Future and spot price
RIL	0.780583
TCS	0.930634
SBI	0.934823
HDFC	0.867133
ICICI	0.941238

From the above table, it is found that the **correlation** between spot price future price of RIL is 0.780586699. It shows that future of company & spot price of company it highly positive correlation. It rivals that if there are the change in spot/future price, changes will be also on future/spotprice in same direction. The **correlation** between spot price and futureprice of ITCS

is 0.930634 , of SBI is 0.934823, of HDFC is 0.867133 and ICICI is 0.941238

VII.1 Regression Analysis to measure impact of future price on spot price

VII.1.1 Regression Analysis to measure impact of future price on spot price of RIL

Regression Statistics	
Multiple R	0.780586699
R Square	0.609315594
Adjusted R Square	0.570247154
Standard Error	89.88290788
Observations	11

ANOVA

	DF	SS	MS	F	Significance F
Regression	1	125999.971	125999.971	15.59610738	0.002733866
Residual	10	80789.37129	8078.937129		
Total	11	206789.3423			

	Coefficients	Standard Error	t Stat	P-value
Intercept	169.3277398	606.6037626	0.279140603	0.785824808
Future PRICE	0.937853224	0.237479851	3.949190725	0.00273866

It can be observed from table 1 that all explanatory variables, taken together establish a relationship nearly **78.05% (Multiple R=0.780586699)** of total variables in the Y= spot price impact on future price in each month. This means whatever changes in the spot price for the period under study the future price is responsible up to 78.05%. from this it can be deduced that there is another factor which have indirectly affected the spot price of share. Above table , significant **F value = 0.002733866** which is less than 0.05. it indicates that the Null Hypothesis is rejected and Alternative Hypothesis is selected. It shows regression model is fit. It means there

is effect of independent variables (Future price) on dependent variable (Spot price). From table , it can be observed T that value of T statistics is $P= 4.77563E-15$ for independent variable of future price which is significant at 5% level of significance and hence thus shows that there is significant impact of future price on spot price (dependent variable). Beta coefficient of future is $= 0.983847478$ thereby accepting that future price has the positive impact on spot price. Spot price is expressed and effected by 0.983847478 of future price.

VII.1.2 Regression Analysis to measure impact of future price on spot price of RIL of TCS

Regression Statistics	
Multiple R	0.930633656
R Square	0.866079002
Adjusted R Square	0.852686902
Standard Error	86.08865879
Observations	12

ANOVA

	DF	SS	MS	F	Significance F
Regression	1	479292.6	479292.6	64.67089	1.12E-05
Residual	10	74112.57	7411.257		
Total	11	553405.2			

	Coefficients	Standard Error	t Stat	P-value
Intercept	324.6854492	380.8104	0.852617	0.413826
future	0.899207342	0.111816	8.041821	1.12E-05

It can be observed from table 1 that all explanatory variables, taken together establish a relationship nearly **93.06% (Multiple R=0.930633656)** of total variables in the Y= spot price impact on future price in each month. This means whatever changes in the spot price for the period under study the future price is responsible up to 93.06%. from this it can be deduced that there is another factor which have indirectly affected the spot price of share. Above table 2, significant **F value = 1.12E-05** which is less than 0.05. it indicates that the Null Hypothesis is rejected and Alternative Hypothesis is selected. It shows regression model is

fit. It means there is effect of independent variables (Future price) on dependent variable (Spot price). From table 3, it can be observed T that value of T statistics is $P = 1.12E-05$ for independent variable of future price which is significant at 5% level of significance and hence thus shows that there is significant impact of future price on spot price (dependent variable). Beta coefficient of future is $= 0.899207342$ thereby accepting that future price has the positive impact on spot price. Spot price is expressed and effected by 0.899207342 of future price.

VII.1.3 Regression Analysis to measure impact of future price on spot price of RIL of SBI

Regression Statistics	
Multiple R	0.934823
R Square	0.873895
Adjusted R Square	0.861284
Standard Error	18.36401
Observations	12

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	23370.07	23370.07	69.29869	8.3E-06
Residual	10	3372.367	337.2367		
Total	11	26742.43			

	Coefficients	Standard Error	T Stat	P-value
Intercept	8.064342	62.5777	0.128869	0.900016
Future	0.998834	0.119986	8.324584	8.3e-06

It can be observed from table 1 that all explanatory variables, taken together establish a relationship nearly **93.48% (Multiple R=0.934823)** of total variables in the Y= spotprice impact on future price in each month. This means whatever changes in the spot price for the period under study the future price is responsible up to 93.48%. from this it can be deduced that there is another factor which have indirectly affected the spot price of share. Above table, significant **F value = 8.3E-06** which is greater than 0.05. it indicates that the Null Hypothesis is accepted and Alternative Hypothesis is rejected. It shows regression model is fit. It means

there is effect of independent variables (Future price) on dependent variable (Spot price).

From table , it can be observed T that value of T statistics is P = 8.3E-06 for independent variable of future price which is significant at 5% level of significance and hence thus shows that there is significant impact of future price on spot price (dependent variable). Beta coefficient of future is = 0.998834 thereby accepting that future price has the positive impact on spot price. Spot price is expressed and effected by 0.998834 of future price.

VII.1.4 Regression Analysis to measure impact of future price on spot price of RIL of HDFC

Regression Statistics	
Multiple R	0.867133
R Square	0.75192
Adjusted R Square	0.727112
Standard Error	44.38057
Observations	12

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	59698.85	59698.85	30.3096	0.00026
Residual	10	19696.35	1969.635		
Total	11	79395.21			

	Coefficients	Standard Error	t Stat	P-value
Intercept	88.4559	250.3444	0.353337	0.731171
Future PRICE	0.941158	0.170951	5.505415	0.00026

It can be observed from table 1 that all explanatory variables, taken together establish a relationship nearly **86.71% (Multiple R=0.867133)** of total variables in the Y= spot price impact on future price in each month. This means whatever changes in the spot price for the period under study the future price is responsible up to 86.71%. from this it can be deduced that there is another factor which have indirectly affected the

spot price of share. Above table 2, significant **F value = 0.00026** which is greater than 0.05. it indicates that the Null Hypothesis is accepted and Alternative Hypothesis is rejected. It shows regression model is fit. It means there is effect of independent variables (Future price) on dependent variable (Spot price).

VII.1.5 Regression Analysis to measure impact of future price on spot price of RIL of ICICI

Regression Statistics	
Multiple R	0.941238
R Square	0.885929
Adjusted R Square	0.874522
Standard Error	29.19254
Observations	12

ANOVA

	DF	SS	MS	F	Significance F
Regression	1	66186.18	66186.18	77.66467	5E-06
Residual	10	8522.045	852.2045		
Total	11	74708.22			

	Coefficients	Standard Error	T Stat	P-value
Intercept	62.65357	85.83685	0.729915	0.482191
Future PRICE	0.933518	0.105928	8.812756	5e-06

It can be observed from table 1 that all explanatory variables, taken together establish a relationship nearly **94.12% (Multiple R=0.941238)** of total variables in the Y= spotprice impact on future price in each month. This means whatever changes in the spot price for the period under study the future price is responsible up to 94.12%. from this it can be deduced that there is another factor which have indirectly affected the spot price of share. o Above table 2, significant **F value = 5E-06** which is greater than 0.05. it indicates that the Null Hypothesis is accepted and Alternative Hypothesis is rejected. It shows regression model is fit. It means there is effect of independent variables (Future price) on dependent variable (Spot price). From table 3, it can be

observed T that value of T statistics is P = **5E-06** for independent variable of future price which is significant at 5% level of significance and hence thus shows that there is significant impact of future price on spot price (dependent variable). Beta coefficient of future is = 0.933518 thereby accepting that future price has the positive impact on spot price. Spot price is expressed and effected by 0.933518 of future price.

VIII. FINDINGS

Findings of Regression Analysis for m measuring impact of future price on spot price

No.	Company Name	P Value	Significant or Not Significant
1.	Reliance Industry	0.002733866	Significant
2.	Tata Constantly Service	1.12E-05	Significant
3.	SBI	8.3E-06	NOT Significant
4.	HDFC	0.00026	Significant
5.	ICICI Bank	5E-06	Significant

Regression Line:

No.	Company Name	Regression Line
1.	RIL	Spot price = 169.3277398 + 0.937853224 (futureprice)
2.	TCS	Spot price = 324.6854492 + 0.899207342 (futureprice)
3.	SBI	Spot price = 8.064342 + 0.998834 (future price)
4.	HDFC	Spot price = 88.4559 + 0.941158 (future price) HDFC
5.	ICICI Bank	Spot price = 62.65357 + 0.933518 (future price)

IX. CONCLUSION

The study concludes that a strong positive relationship exist between Future Price and spot price of selected companies. Overall, the purpose of the study to check the relationship between Future Price and spot price has been fulfilled with a positive outcome. Correlation Analysis shows that there is a highly positive correlation between Future price and spot price.

It means that there are highly correlated. From Regression analysis, it can be concluded that there is highly significant relationship between future price and spot price, so we can say that based on analysis if Future price goes up with spot price is also going up. Other factors are also affecting to spot price. So, predication of analysis is not 100% true.

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ANNEXTURE

MONTH (2022)	HDFC-SPOT PRICE	HDFC-FUTURE PRICE	ICICI-SPOT PRICE	ICICI-FUTURE PRICE
January	1485.7	1498	788.8	780
February	1426.25	1472	742.7	767
March	1470.35	1419	730.3	710
April	1384.6	1470	743.3	742
May	1388.95	1362	752.85	731
June	1348	1365	707.2	721
July	1434.2	1391	818.6	749
August	1486.1	1468	887.3	852
September	1421.35	1454	862	878
October	1496.7	1453	908.7	891
November	1608.45	1568	952.9	933
December	1628.15	1630	890.85	923

MONTH (2022)	RIL-SPOT PRICE	RIL-FUTURE PRICE	TCS-SPOT PRICE	TCS-FUTURE PRICE	SBI-SPOT PRICE	SBI-FUTURE PRICE
January	2386.6	2415	3736.25	3800	538.3	501
February	2359.55	2365	3554.2	3655	483.2	510
March	2634.75	2464	3739.95	3629	493.55	475
April	2790.25	2707	3546.7	3653	496.3	501
May	2632.65	2648	3364.35	3403	468.1	473
June	2595.65	2679	3267.1	3291	465.9	460
July	2509.45	2509	3301.9	3217	528.35	498
August	2637.95	2589	3211.15	3270	531.25	530
September	2377.75	2488	3004.55	3105	530.6	535
October	2549.6	2467	3193.15	3097	573.8	553
November	2731.35	2646	3390.8	3314	602.45	594
December	2547.2	2647	3256.7	3347	613.7	606