A Causal Nexus between Futures & Spot With Reference To Stock Futures of Nifty 50 on NSE in India

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ABSTRACT

This study investigates whether there exists a relationship between spot and future closing prices for stock futures of NIFTY 50 on NSE in India for selected industry specific stock futures. For accomplishing the objective 14 select stocks on NIFTY 50 Index with industry specific traded on NSE India for a period from April 2005 to December 2015 considering the inclusions and exclusions from the Nifty 50 Index constituents during the study period. The sample used in this study includes daily future close prices and spot closing prices for 14 select stocks traded on NSE (www.nseindia.com). Since most of the trading activity takes place in near month contracts, only near month contracts are studied using econometric tools descriptive statistics, unit root test, granger causality co-integration and vector error correction method. The analysis reveals there exists bidirectional relationship between spot and futures markets. The study also provides the evidence of long-run equilibrium relationship between the spot market price index and its futures price. It implies that either of these two historical prices will help to forecast the other.

Keywords: Futures closing price, Spot closing price, Granger causality, Co-integration, VECM

I. INTRODUCTION

Financial derivatives have grossed a central place in the financial markets worldwide. The activity in derivatives market has surpassed the growth in other spheres. The emergence and growth of Indian derivatives market since its inception in 2000 has been phenomenal. Within the given span of time, Indian Exchanges and Indian Derivative products feature in the Global rankings. Globally, derivative products on volatility indices are widely used by market participants as tools for risk management and to hedge against market volatility. (SEBI, Annual Report). The trading in derivatives has grown increasingly since inception on NSE. Derivatives market helps in various functions in the financial market in terms of price discovery, portfolio diversification and risk management. Hence trading in derivatives has made a major change in the spot market. The movements in spot market were mainly due to the speculation, hedging and arbitrage activities in the futures market. Hence, examining the cause and effect relationship between the spot and futures in the short run as well in the long run is necessary. Furthermore which market reacts first is it the spot that reacts or future market in the dynamic financial market in India.

II. LITERATURE REVIEW

Dr. K. Srinivasan, Dr. Jain Mathew, Miss. Aditi Davidson (2012) this paper examined the repercussions on the underlying spot market volatility due to the introduction of futures market in India for the period from January 1, 1995 to December 31, 2011. The study concluded that the index futures are playing a very significant role in mitigating the volatility of the market and has contributed towards increased market efficiency and the spill over in the futures market lead to spot market, thereby making the spot market unstable.

Sahu Dhananjay, (2012),this paper examined the impact of equity derivatives trading on spot market volatility, particularly the effect of equity derivatives introduction on spot market volatility in Indian stock market by using daily returns of seventy three companies from April 01, 1998 to March 31, 2008 excluding holidays when there were no transactions. The GARCH (1, 1) model that captures the heteroscedasticity in returns was applied to study market volatility. However, all the companies under study showed asymmetric response and, accordingly the GJR GARCH model that captured the asymmetric response has been applied by using CNX Nifty index return as the independent variable in order to remove the influence of market wide factors on equity returns. The results indicated that the

coefficient of the dummy variable was significant and negative and thus it concluded that introduction of equity derivatives trading has reduced spot market volatility.

Kapil Choudhary, Sushil Bajaj, Intraday (2012), this study investigated whether spot and futures markets are playing an important role in the assimilation of information and price discovery in the Indian stock market.The study applied the Johansen's co-integration and Engle and Granger's residual based approach to determine the long-run equilibrium between the two markets. Besides this, Granger causality test and VECM (Vector Error Correction Model) were applied to determine the direction of causality and the leading market. The results of the study depicted that there is a bi-directional information flows or feedback between the spot and futures markets

Mall Manmohan (2011), this paper focused to study India's stock Index Futures market during 2000 to 2011. It also empirically tested the efficiency of Indian spot and index futures market, examined the time varying properties of Indian spot and index futures market volatility using GARCH, ADF, PP, VECM and Johansen's Co-integration test for the period starting from June 2000 to May 2011 having collected the closing prices of near month futures contract and the daily closing prices of S&P CNX NIFTY. The conclusions drawn were that the capital market efficiency test provides the evidence of weak form inefficiency of Indian spot market and the futures market is relatively efficient form the spot market. The relative efficiency of futures market was the result of introduction of index futures. High persistence of volatility in the futures market gave rise to unidirectional volatility spill over from index futures to spot market. It also concluded that there exists long run causality running from the index futures prices to the spot market prices.

Shiqing Xie, Jiajun Huang (2013), this paper examined an empirical analysis on the price discovery function of index futures in China for CSI 300 index period of the study from April 2010 to April 2012 using Vector Error Correction Model (VECM).the conclusions drawn were that solid cointegration relationship between the CSI 300 index and its index futures exists in the long run; when prices deviate from the long term equilibrium, the stock index reverses weakly, while the reversal of index futures is much stronger; the daily lead-lag relationship between the prices of the CSI 300 index and its index futures contracts is not significant in the short run; shocks from the spot market have a lasting impact upon the futures market, but not vice versa, due to the limited short-term adjustment ability of the spot market.

Goyal Niti (2012), this paper studied the estimation level of volatility prevailing in the Indian stock market, examined whether volatility is static or it has changed over time, the impact of derivatives trading on price discovery, analysed the impact of derivatives trading on stock market volatility of indices and that of individual shares and has the introduction of derivatives been really successful in reducing the volatility in the stock market or change in volatility is due to some other macroeconomic factors? The study concluded that there was volatility in the Indian Stock Market, there was change in level of stock market volatility after introduction of derivatives, derivatives trading is not helpful in discovering the prices of equity shares, trading derivatives has impacted stock market volatility, derivatives introduction has not been successful in reducing the volatility.

III. RESEARCH METHODOLOGY

The analysis is conducted for 14 select stocks on NIFTY 50 Index considering industry specific traded on NSE India for a period from April 2005 to December 2015 considering the inclusions and exclusions from the Nifty 50 Index constituents during the study period, using various tools to achieve the objective. In order to help in comparative analysis the period of study is kept uniform from 1st April 2005 to 31st December 2015. The sample used in this study includes daily future close prices and spot closing prices for 13 select stocks traded on NSE (www.nseindia.com). Since most of the trading activity takes place in near month contracts, only near month contracts are examined. All the values are converted to natural logarithm, calculated as $R_t = LN(P_t / P_{t-1})$ where P_t and P_{t-1} are natural logarithms on day t and t-1 respectively to prevent non-stationarity, to achieve accurate results for the test incorporated. The tools used are Descriptive Statistics, Unit Root Test, Granger Causality Johansen's Co-integration and Vector Error Correction Model.

Table 1. Description of Sample

AUTOMOBILE INDUSTRY	SYMBOL	ENERGY INDUSTRY	SYMBOL	FINANCIAL SERVICES	SYMBOL
Hero MotoCorp Ltd.	HEROMOTOCO	Bharat Petroleum Corporation Ltd.	BPCL	Bank of Baroda	BANKBARODA
Mahindra & Mahindra Ltd.	M&M	GAIL (India) Ltd.	GAIL	Housing Development Finance Corporation Ltd.	HDFC

Maruti Suzuki India Ltd.	MARUTI	Oil & Natural Gas Corporation Ltd.	ONGC	HDFC Bank Ltd.	HDFCBANK
Tata Motors Ltd.	TATAMOTORS	Reliance Industries Ltd.	RELIANCE	ICICI Bank Ltd.	ICICIBANK
		Tata Power Co. Ltd.	TATAPOWER	State Bank of India	SBIN

OBJECTIVE

To examine the causal nexus between Stock Futures and Spot in India.

IV. DATA ANALYSIS

Descriptive Statistics

To examine the cause and effect relationship between future close price and spot close price we calculate daily log-returns of the select 14 stocks based on its daily future close price and spot close price during 1st April 2005 to 31st Dec.2015. To know the distribution pattern and also the performance of the stocks descriptive analysis of spot close price is examined. The descriptive statistics of spot close prices, is summarised in the below table 1.9 in terms of mean, standard deviation, Skewness, Kurtosis and Jarque Bera for select 14 stocks for the period from 1st Apr.2005 to 31st Dec.2015.

Table 2. Descriptive Statistics of Log Spot Close Price (LNSCL)

Industry (Stocks)	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs
AUTOMOBILE							
HEROMOTOCO	0.000605	0.020005	0.498345	9.347388	4580.662	0	2669
MAHINDRA	0.000344	0.030417	-8.20243	190.9113	3947872	0	2669
MARUTI	0.000898	0.021448	-0.07396	5.98711	992.4896	0	2669
TATAMOTORS	-3.50E-05	0.042242	-22.5655	883.9484	86337445	0	2669
ENERGY							
BPCL	0.000327	0.027625	-6.12171	166.6597	2988596	0	2669
GAIL	0.000195	0.023552	-2.62723	54.5215	297598.5	0	2669
ONGC	-0.00047	0.036193	-24.2226	954.9631	1.01E+08	0	2669
RELIANCE	0.00023	0.026607	-8.11114	216.4365	5083923	0	2669
TATAPOWER	-0.00062	0.051322	-34.8822	1580.987	2.77E+08	0	2669
FINANCIAL SERVICES							
BANKBARODA	-7.70E-05	0.040686	-23.5047	938.7657	97406699	0	2669
HDFC	0.000207	0.038727	-25.3167	1036.782	1.19E+08	0	2669
HDFCBANK	0.000252	0.037180	-30.1994	1307.906	1.89E+08	0	2669
ICICIBANK	-0.00016	0.041202	-22.0019	856.0108	80951178	0	2669
SBIN	-0.0004	0.050065	-35.539	1621.337	2.91E+08	0	2669

Source: Computed Value.

Table 2 represents the descriptive statistics of spot close return series for select 14 stocks. It shows positive mean returns for BPCL, GAIL, HDFC, HDFCBANK, HEROMOTOCORP, MAHINDRA, MARUTI and RELIANCE indicating that the spot close prices performed superior whereas negative mean returns were observed for BANKBARODA, ICICIBANK, ONGC, SBI, TATAMOTORS and TATAPOWER signifying lower performance. The standard deviation is high for TATAPOWER stock with 0.051322 & lowest for HEROMOTOCORP with 0.020005. The skewness for all stocks is found to be negatively skewed except in case of HEROMOTOCORP stock. Kurtosis value exceeds 3, showing a leptokurtic curve indicates that the unconditional return distributions are not normal. JB test confirms that the normality is rejected at p-value of almost 1% level of significance.

Table 3. Descriptive Statistics of Log Future Close Price (LNFCL)

Industry (Stocks)	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs
AUTOMOBILE							
HEROMOTOCO	0.0006	0.019482	0.43559	8.927979	3992.366	0	2669
MAHINDRA	0.000343	0.030370	-8.73226	201.7414	4426443	0	2669
MARUTI	0.000887	0.021347	-0.12623	6.341993	1249.164	0	2669
TATAMOTORS	-3.56E-05	0.042239	-22.8511	898.3168	89376019	0	2669
ENERGY							
BPCL	0.000332	0.027364	-5.85755	157.921	2684320	0	2669
GAIL	0.000199	0.023739	-2.63006	54.03742	292754.5	0	2669
ONGC	-0.00049	0.036324	-23.5156	920.9992	93963760	0	2669
RELIANCE	0.000217	0.026580	-8.12283	216.8377	5114523	0	2669
TATAPOWER	-0.00063	0.051452	-34.5541	1562.17	2.71E+08	0	2669
FINANCIAL SERVICES							
BANKBARODA	-0.00013	0.040924	-23.1398	920.5788	93870142	0	2669
HDFC	0.00021	0.038564	-25.8802	1068.587	1.27E+08	0	2669
HDFCBANK	0.000255	0.037103	-30.4198	1321.784	1.94E+08	0	2669
ICICIBANK	-0.00017	0.041191	-22.1308	863.7654	82614012	0	2669
SBIN	-0.00041	0.050314	-35.114	1596.692	2.83E+08	0	2669

Source: Computed Value.

The following significant observations can be made from the Table 3: The mean returns of the future close prices of the stocks namely BPCL, GAIL, HDFC, HDFCBANK, HEROMOTOCORP, MAHINDRA, MARUTI and RELIANCE are positive which implies the price series had increased and that of BANKBARODA, ICICIBANK, ONGC, SBI, TATAMOTORS and TATAPOWER are negative implies that the price series had decreased over the period from April 2005 to December 2015. The volatile nature of the stocks is evident from the statistics on standard deviation of daily future close price returns. The least volatile stock is HEROMOTOCORP with standard deviation of 0.019482. The highest standard deviation is observed in the TATAPOWER with 0.051452 indicating the most highly volatile stock in terms of the future close prices. Negatively skewed implies that the return distribution of stock futures have a heavier tail of larger values and hence a higher probability of earning higher returns for all the stocks except for HEROMOTOCORP having positive skewness which means there are higher chances of generating lower returns. Kurtosis value exceeds 3, showing a leptokurtic curve indicates that the unconditional return distributions are not normal. JB test confirms that the normality is rejected at p-value of almost 1% level of significance.

Unit Root Test:

This study uses the standard Augmented Dickey-Fuller test (ADF) to test whether the assumed time series is I (1) which is a necessary condition for the further testing procedure. First, test for the unit roots in the cases when intercept is present in the regression, then when there is intercept and trend, and finally without intercept and trend. If not able to reject the null Hypothesis about the unit root run the ADF on the first differences of the original time series. In this step, we can reject the null Hypothesis about the unit root in order to be able to conclude that the original time series are I (1). The data used for are daily future close prices and spot close prices covers for a period from 1st April 2005 to 31st December 2015. All the daily values are converted to natural logarithm, calculated as R_t= LN (P_t / P_{t-1}) where P_t and P_{t-1} are natural logarithms on day t and t-1 respectively. The variables for the study after converting to natural logarithms the series are found to be stationary at levels and hence we reject the null concluding that the series has a unit root. Thus, the series are stationary since the null hypothesis is rejected that the data is non-stationary or has a unit root as represented in the table 4.

H_0- *Has a unit root (i.e. the data is non-stationary)*
H_1- *Does not have a unit root (i.e. the data is stationary)*

Table 4. ADF Test Results for Future Close Price & Spot Close Price

STOCKS	FUTURE CLOSE PRICE			SPOT CLOSE PRICE		
	INTERCEPT	TREND & INTERCEPT	NONE	INTERCEPT	TREND & INTERCEPT	NONE
AUTOMOBILE						
HEROMOTOCO	-50.38299*	-50.37687*	-50.34587*	-32.88722*	-32.88477*	-32.82099*
MAHINDRA	-48.91175*	-48.90294*	-48.91500*	-48.71005*	-48.70123*	-48.71327*
MARUTI	-49.36379*	-49.35789*	-49.29166*	-49.05111*	-49.04524*	-48.97982*
TATAMOTORS	-45.56743*	-48.55966*	-48.57650*	-48.10293*	-48.09518*	-48.11196*
ENERGY						
BPCL	-51.00927*	-51.00404*	-51.01144*	-51.10742*	-51.10160*	-51.11013*
GAIL	-53.82910*	-53.82450*	-53.83524*	-53.32427*	-53.32001*	-53.33054*
ONGC	-51.32418*	-51.31807*	-51.32469*	-50.72645*	-50.72007*	-50.72765*
RELIANCE	-50.59414*	-50.59995*	-50.60032*	-50.09545*	-50.10025*	-50.10128*
TATAPOWER	-52.42049*	-52.43148*	-52.42237*	-52.29445*	-52.30516*	-52.29656*
FINANCIAL SERVICES						
BANKBARODA	-50.92400*	-50.94875*	-50.93301*	-50.78092*	-50.80379*	-50.79029*
HDFC	-51.65956*	-51.65341*	-51.66772*	-51.64434*	-51.63831*	-51.65264*
HDFCBANK	-51.36043*	-51.35435*	-51.36765*	-51.19196*	-51.18559*	-51.19912*
ICICIBANK	-49.88977*	-49.91406*	-49.89833*	-49.44036*	-49.46400*	-49.44911*
SBIN	-51.17824*	-51.22239*	-51.18442*	-50.73245*	-50.77628*	-50.73895*

*Source: Computed Value. Note: * denotes rejection of null hypothesis at 5% level of significance*

Granger Causality Test

The procedure for testing statistical causality between future close prices and spot close prices a direct "Granger-causality" test proposed by C. J. Granger in 1969 is used. Granger causality may have more to do with precedence, or prediction, than with causation in the usual sense.

H_0- *Spot Close Price does not granger cause Future Close Price*
H_{01}- *Future Close Price does not granger cause Spot Close Price*

Table 5. Granger Causality Test Results

STOCKS	LAGS	LNSCL -> LNFCL	LNFCL -> LNSCL
AUTOMOBILE			
HEROMOTOCO	7	1.14032 (0.3346)	2.08086 (0.0424)*
MAHINDRA	8	1.43996 (0.1746)	1.16155 (0.3187)
MARUTI	8	2.10917 (0.0318)*	1.73602 (0.0853)
TATAMOTORS	7	0.48140 (0.8487)	1.01644 (0.4173)
ENERGY			
BPCL	7	2.02020 (0.0491)*	2.89409 (0.0052)*
GAIL	8	1.34921 (0.2143)	2.02504 (0.0400)*
ONGC	8	0.52971 (0.8349)	0.41292 (0.9138)
RELIANCE	8	0.54803 (0.8208)	0.46205 (0.8833)
TATAPOWER	7	0.33248 (0.9394)	0.71093 (0.6628)
FINANCIAL SERVICES			
BANKBARODA	3	0.04576 (0.9870)	2.27094 (0.0784)
HDFC	7	0.96561 (0.4546)	0.86443 (0.5339)

HDFCBANK	6	0.50583 (0.8044)	0.93952 (0.4653)
ICICIBANK	7	0.63679 (0.7258)	0.32267 (0.9441)
SBIN	7	1.37511 (0.2113)	0.74493 (0.6338)

*Source: Computed Value. Note: * denotes rejection of hypothesis at 5% level of significance*

Table 5 represents the results of Granger Causality test wherein it is witnessed that there exist a bi-directional causality from spot to future close price returns for BPCL stocks. There exist unidirectional causality from futures to spot for GAIL & HEROMOTOCORP whereas from spot to futures is observed in MARUTI. No causality was found between spot and futures for HDFC, HDFCBANK, ICICIBANK, MAHINDRA, ONGC, RELIANCE, SBI and TATAMOTORS indicates that spot is not causing the future so also the future is not causing the spot for the study period.

Cointegration

H_0- there is no co-integration between Future Close Price & Spot Close Price
H_1- there is co-integration between Future Close Price & Spot Close Price

Table 6. Johansen Co-integration Results

STOCK	NO.OF CE(S)	EIGENVALUE	TRACE STATISTIC	PROBABILITY
AUTOMOBILE				
HEROMOTOCO	NONE	0.061570	168.8129	0.0001*
	AT MOST 1	0.000252	0.666425	0.4143
M&M	NONE	0.044750	124.7318	0.0001*
	AT MOST 1	0.001356	3.591730	0.0581
MARUTI	NONE	0.066764	187.2785	0.0001*
	AT MOST 1	0.001679	4.447678	0.0349*
TATAMOTORS	NONE	0.040291	110.8295	0.0001*
	AT MOST 1	0.000760	2.011177	0.1561
ENERGY				
BPCL	NONE	0.075849	210.4941	0.0001*
	AT MOST 1	0.000672	1.778567	0.1823
GAIL	NONE	0.045385	130.3821	0.0001*
	AT MOST 1	0.002824	7.483884	0.0062*
ONGC	NONE	0.050252	138.6104	0.0001*
	AT MOST 1	0.000826	2.187188	0.1392
RELIANCE	NONE	0.057926	161.5341	0.0001*
	AT MOST 1	0.001376	3.643175	0.0563
TATAPOWER	NONE	0.049731	136.4213	0.0001*
	AT MOST 1	0.000547	1.447487	0.2289
FINANCIAL SERVICES				
BANKBARODA	NONE	0.048216	134.0132	0.0001*
	AT MOST 1	0.001229	3.255016	0.0712
HDFC	NONE	0.068227	191.8367	0.0001*
	AT MOST 1	0.001833	4.853971	0.0276*
HDFCBANK	NONE	0.046008	129.8842	0.0001*
	AT MOST 1	0.001985	5.257821	0.0218*
ICICIBANK	NONE	0.047472	135.1798	0.0001*
	AT MOST 1	0.002450	6.489613	0.0108*
SBIN	NONE	0.048992	136.2750	0.0001*
	AT MOST 1	0.001269	3.359951	0.0668

*Source: Computed Value. Note: * denotes rejection of hypothesis at 5% level of significance*

Johansen Co-integration test is used to examine the long run relationship. It is well known that Johansen Co-integration is very sensitive to the choice of lag length. So first a VAR model is fitted to the time series data in order to find an appropriate lag structure. The AIC, SC, LR are used to select the number of lags required in co-integration test. The co-integration test indicates there exist one co-integrating vector at the 5% level of significance. This indicates that the future close price and spot close price is co-integrated in long run. The trace test indicates the existence of two co-

integrating equation at 5 % level of significance. Maximum Eigen Value test makes the confirmation of this result. Thus the 2 variables of the study have a long run equilibrium relationship between them. But in short run there may be deviations from this equilibrium & we have to verify whether such equilibrium converges to long run equilibrium or not. Thus VECM can be used to generate the short run dynamics.

Vector Error Correction Model

Table 7. Vector Error Correction Results

STOCKS	C(1) LNF CL (-1)	C(2) D LNF CL (-1)	C(3) D LN F CL (-2)	C(4) D LNSCL (-1)	C(5) D LNSCL (-2)	C(6) C
AUTOMOBILE						
HEROMOTOCO	0.572622	-1.08862	-0.53412	0.500009	0.22756	2.44E-05
	4.044371	-9.80837	-7.45515	4.362621	3.15004	0.054954
	0.0001*	0*	0*	0*	0.0017*	0.9562
M&M	-1.65834	0.429311	0.081386	-1.03886	-0.36912	2.10E-05
	-4.68824	1.608924	0.541775	-3.91799	-2.46924	0.030938
	0*	0.1078	0.588	0.0001*	0.0136*	0.9753
MARUTI	-0.79969	-0.20779	-0.14531	-0.41169	-0.15085	3.96E-05
	-3.0809	-1.05885	-1.27565	-2.10142	-1.32667	0.082496
	0.0021*	0.2898	0.2022	0.0357*	0.1847	0.9343
TATAMOTORS	-0.41321	-0.36246	-0.05256	-0.23633	-0.24953	3.28E-05
	-0.9866	-1.1271	-0.27957	-0.7367	-1.33048	0.034357
	0.3239	0.2598	0.7798	0.4614	0.1835	0.9726
ENERGY						
BPCL	-0.95534	0.019178	0.098869	-0.6756	-0.41478	3.49E-05
	-3.2871	0.086275	0.740379	-3.04981	-3.12483	0.056866
	0.001*	0.9313	0.4591	0.0023*	0.0018*	0.9547
GAIL	-0.12142	-0.75202	-0.36928	0.06773	0.009082	3.23E-05
	-0.55397	-4.47104	-3.57275	0.39547	0.086548	0.060111
	0.5796	0*	0.0004*	0.6925	0.931	0.9521
ONGC	-0.25008	-0.63382	-0.31338	-0.01734	-0.00505	1.58E-06
	-0.64674	-2.12992	-1.75563	-0.0582	-0.02821	0.00192
	0.5179	0.0333*	0.0793	0.9536	0.9775	0.9985
RELIANCE	2.544755	-2.6471	-1.1586	2.046858	0.880003	7.01E-06
	5.162687	-6.92898	-5.06112	5.303133	3.819922	0.011613
	0*	0*	0*	0*	0.0001*	0.9907
TATAPOWER	-0.92318	-0.05562	0.070614	-0.61497	-0.39959	2.45E-05
	-1.78633	-0.13989	0.300413	-1.54579	-1.69803	0.021054
	0.0742	0.8888	0.7639	0.1223	0.0896	0.9832
FINANCIAL SERVICES						
BANKBARODA	0.088536	-0.62739	-0.22467	-0.0288	-0.1111	1.60E-05
	0.211452	-1.93522	-1.16031	-0.08817	-0.57061	0.017421
	0.8326	0.0531*	0.246	0.9297	0.5683	0.9861
HDFC	-0.14234	-0.67221	-0.19102	0.019917	-0.14216	3.53E-05
	-0.2539	-1.58509	-0.76597	0.046843	-0.56959	0.04043
	0.7996	0.1131	0.4438	0.9626	0.569	0.9678
HDFCBANK	0.079437	-0.88717	-0.39177	0.23329	0.055773	1.05E-05

	0.156036	-2.30488	-1.76737	0.605254	0.251452	0.012586
	0.876	0.0213*	0.0773	0.5451	0.8015	0.99
ICICIBANK	-0.78251	-0.25594	-0.06704	-0.3727	-0.25743	1.28E-05
	-1.79936	-0.76615	-0.33482	-1.1199	-1.28831	0.013797
	0.0721	0.4437	0.7378	0.2629	0.1977	0.989
SBIN	-1.62161	-0.00574	-0.09994	-0.63917	-0.22379	3.61E-05
	-2.11537	-0.0098	-0.29337	-1.09115	-0.65531	0.031846
	0.0345*	0.9922	0.7693	0.2753	0.5123	0.9746

Source: Computed Value.

It is observed that in the short run dynamics results from the error correction co-integrating term C(1) indicates the long run relationship and C(2) to C(6) indicates the short run relationship among the variables. It is being reflected that there exist a short run relationship among the variables for the majority of stocks. In all these cases where the co-integrating term is negative and significant it is indicated that the errors are going back to the equilibrium and the error is getting corrected whereas the positive and significant co-integrating term indicates that the errors are getting exploded.

CONCLUSIONS

The main arguments in favour of futures market leads spot market are mainly due to the advantages provided by the futures market includes higher liquidity, lower transaction costs, lower margins, ease leverage positions, rapid execution and greater flexibility for short positions. Such advantages attract larger informed traders and make the futures market to react first when market- wide information or major stock-specific information arrives. Thus, the future prices lead the spot market prices. On the other hand, the low cost contingent strategies and high degree of leverage benefits in futures market attracts larger speculative traders from a spot market to a more regulated futures market segments. Hence, this ultimately reduces informational asymmetries of the spot market through reducing the amount of noise trading and helps in price discovery, improve the overall market depth, enhance market efficiency and increase market liquidity. This makes spot market to react first when market-wide information or major stock- specific information arrives. Hence, spot market leads the futures market. Besides, there exists a bidirectional relationship between the futures and spot markets through price discovery process.

This may be mainly due to future markets attracts larger informed traders to enjoy the advantages of higher liquidity, lower transaction costs, lower margins and greater flexibility for short positions. Hence, these advantages make futures markets to lead the spot markets around macroeconomic or major stock-specific information releases. Consequently, the spot markets will lead the futures market under the circumstances that these advantages of futures markets attracts larger speculative traders from a spot market and reduces informational asymmetries of the spot market through reducing the amount of noise trading and helps in price discovery, improve the overall market depth, enhance market efficiency and increase market liquidity. This makes spot market to react fast when market-wide information or major stock specific information arrives. Thus, both the spot and futures markets are said to be informational efficient and reacts more quickly to each other. Johansen's Cointegration technique followed by the Vector Error Correction Model (VECM) was employed to examine the long run relationship between Stock futures and Stock Index Futures. The empirical analysis was conducted for the daily data series from April, 2005 to December 2015. The analysis reveals the bidirectional relationship between spot and futures markets. The study also provides the evidence of long-run equilibrium relationship between the spot market price index and its futures price. It implies that either of these two historical prices will help to forecast the other, which is the evidence for disapproving market efficiency hypothesis between these two markets.

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