Nifty Spot & Futures: An Empirical Study

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ABSTRACT

The investments of an investor can be managed with the help of various new investment avenues like futures. The Nifty 50 spot is one most important index of the National Stock Exchange i.e., NSE. Nifty Index keeps the track of 50 blue chip companies behavior. A good recognition has been gained in the present era by the derivative products. The values of Nifty futures are taken from spot prices of Nifty. The investment portfolio of theinvestor can be diversified with the help of futures. The present research paper analysis the relationship between Nifty spot and futures. The various tools like Vector Error Correction Model (VECM), Unit Root Test, Johnsen Cointegration Test are used to analyze the results.

Key Words: Nifty, VECM, ADF, PP and Johnsen Cointegration

INTRODUCTION

The derivatives market is such a mechanism of financial nature where result is worth of other securities basket. The investors have a large number of options to make an investment in the capital markets. It was year 2000 (June month) in which futures came into existence for the first time. With the passage of the time stock futures index options, interest rate futures were introduced. The Govt. of India took the initiative of economic reforms in the year 1991.A diverse range of investment products launched in the market. One of such important investment instruments is futures contract. The investors who are interested to make an investment in the futures market should have the knowledge of market situations. Generally, a common man makes the investments in the savings of post office, deposits in the banks etc. The futures market manages the investments beyond the traditional tools of investments other than bond & stock markets. In the present era derivative products like stock & futures options have a great value.

REVIEW OF LITERATURE

Patnaik, Anuradha (2010)in the research paper analyzed that after the period of liberalization in India pressure was found in the economy due to inflation. The focus of the research paper was to make an identification of factors responsible for inflation in India. The VAR environment was used for the study. ECM was performed for the cointegrated variables. The use of impulse response function showed for the cointegrated VAR environment a lag of inflation response as compared to changes in the othervariables.

Bhunia, Amalendu, Sanjib Pakira (2014)in the research paper an analysis made for the gold and currency exchange rate. The daily data was used for the analysis. There was an indication of the Johnsen Cointegration test and an association was found in the variables used for the study.

Hussain et al. (2014) made a focus in the study to explore the linkage between Pakistan's rate of interest and also in stock market in Karachi for the years 1994-2014.Interest rates in the short run, treasury bills were used in the analysis. The use of ECM & cointegration test was conducted.

Sathyanarayana, S, Sudhindra Gargesha (2016)in the research paper explored the BSE Sensex benchmark pricing behaviour & NSE Nifty as compared to BREXIT. For the analysis of the stationarity ADF test was used.

Sathyanarayana S. (2017)in the research paper probed the impact of various political events on the stock markets. So as to analyze the stationarity of the data Augmented Dickey Fuller test was used.

Need of the Study

The research paper analysis the relationship between spot & futures market. To explore the relationship between the spot and futures market the tests of descriptives, Vector Error Correction Model (VECM), tests of unit root & Johnsen cointegration tests for spot & futures of Nifty Index were used.The Nifty 50 spot is one most important

index of the National Stock Exchange i.e., NSE.Nifty Index keeps the track of 50 blue chip companies behavior. The focus of the present study is to make an analysis of the prices of the Nifty fifty spot and futures. As there is a yawning gap between study of the Nifty spot and futures which is helpful for the future spot arbitrage and helpful to reduce the risk.

Study Objective
1. To explore the Nifty Spot and Futures Market relationship.

Hypothesis are as follows
H_0 No significant relationship exists in between spot and futures market.
H_a There is a significant relationship in between spot and futures market.

RESEARCH METHODOLOGY

To explore the relationship between Nifty spot and futures data from NSE has been used. The NSE Nifty futures was launched on 12th June 2000.The trading in the derivatives commenced from 12th June at NSE India. So, the Nifty spot and futures relationship can be explored after this period. The analysis is based upon the secondary data. The analysis was performed with the help of eviews8software. Data used for analysis is in between January 2000 to December 2017.The use of Unit Root test, Johnsen's cointegration test, Vector Error Correction Model (VECM) was made in the study.

Scope for Future Research Work
The present research work is focused only upon Nifty spot and futures. Other data like from BSE Sensex can be used for study. In the analysis Nifty 50 and Nifty or any minute other relevant data may be useful.

Nifty Spot & Futures Descriptive Analysis
The secondary data is covered in between June 2000 to December 2017.The data under consideration is summary statistics of Nifty spot & futures returns. It was explored by the descriptive analysis that returns of Nifty index spot & futures is similar i.e., 0.00045.

Table 1: Descriptives (Nifty Spot and Futures)for June 2000 to December 2017

	Mean	Med.	Std. Dev.	Kurt.	Skew	Min	Max
Nifty (Spot)	0.00045	0.00088	0.01446	12.5401	-0.30985	-0.13053	0.16334
Nifty (Fut.)	0.00045	0.00070	0.01518	13.7612	-0.47753	-0.16258	0.16194

The NSE spot deviation is lessor than futures of NSE. Skewness of negative nature was found in both series which means for the series long left tail. Kurtosis for both the series is more than 3 & found to be positive.

Nifty Spot & Futures Stationarity Analysis
The evaluation of direction of adjustment in the two series under study is important for the examination of spot and futures market cointegration. The results of Augmented Dickey Fuller (ADF) & Phillips Perron (PP) are available in table 2.

Table 2: Stationarity Test of Nifty Spot and Futures for Period 2000 (June) to 2017 (Dec.)

	ADF		PP	
	Intercept	**Trend and intercept**	**Intercept**	**Trend and intercept**
Spot- Nifty Index	-47.25	-47.25	-64.17	-61.14
Futures-Nifty Index	-64.20	-64.19	-61.14	-64.19
Critical Values				
1 % sig. Level	3.46	4.01	3.46	4.00
5 % Sig. Level	2.88	3.43	2.88	3.43
10 % sig. Level	2.57	3.14	2.58	3.14

It was found that at level series the statistics of ADF & PP have the unit root presence in the Sensex series. The null hypothesis of unit root was rejected. Hence it was the requirement to convert the series into first difference so as to

make the stationarity of the data. The results of unit root are shown in the table above. As the data series are stationary the tests of cointegration can be applied.

Tests of Johnsen Cointegration of Nifty Spot & Futures

When both the series of spot & futures are found to be cointegrated at order one. The test of Johnsen Cointegration can be applied. To explore the integration presence two tests were suggested by Johnsen. Table 3 shows two test results. These are maximum Eigen value & Trace tests.

Table 3: Test of Johansen Cointegration (Nifty Index Spot and Futures) June 2017 to December 2017

Hypothesized No. of CE(S)	Eigen Value	Trace statistics	5% critical value	Prob
None *	0.091	416.20	15.49	0.00
At most 1	0.000005	0.21	3.84	0.64

No disintegration hypothesis was discarded by Eigen value at the level of 5%. It shows cointegration between two markets. Hence it can be said that in a period of short time the two markets can be away from each other but in the long run both move side by side.

Nifty Spot & Futures VECM

The estimates of VECM are presented in the table 4. In the table the coefficient of interest is δs and δ_f. It is seen from the table that for the spot market error correction coefficient is significant with a negative sign. At the time t-1 as compared to the futures price the spot price is comparatively higher. So as to restore the equilibrium in time t there is a downward adjustment in the spot market. It is found that the error correction term coefficient i.e.δ_f for the futures market is also significant statistically. It means that to restore the equilibrium the futures market also contributes. Hence it can be said that to remove the disequilibrium there is an adjustment in the spot and futures.

Table 4: VECM Nifty Index Spot and Futures June 2000 to December 2017

	D (LSPOT)	D (LFUT)
CointEq1	-0.13	0.14
	-0.035	-0.037
	[-3.74]	[3.79]
D (LSPOT (-1))	0.13	-0.02
	-0.04	-0.04
	[3.01]	[-0.40]
D (LSPOT (-2))	0.02	-0.04
	-0.04	-0.04
	[0.44]	[-1.02]
D (LSPOT (-3))	0.022	-0.08
	-0.041	-0.04
	[0.535]	[-1.87]
D (LSPOT (-4))	-0.27	-0.03
	-0.04	-0.04
	[-6.82]	[-0.66
D (LFUT (-1))	-0.05	0.06
	-0.04	-0.04
	[-1.24]	[1.40]
D (LFUT (-2))	-0.07	0.02
	-0.0399	-0.0425
	[-1.70895]	[0.40475]
D (LFUT (-3))	-0.0221	0.0873
	-0.0393	-0.0419

	[-0.56139]	[2.08517]
D (LFUT (-4))	0.2959	0.0424
	-0.0388	-0.0414
	[7.61985]	[1.02595]
C	0.0004	0.0004
	-0.0002	-0.0002
	[1.98050]	[1.88955]

SPOT & FUTURES MARKET RELATIONSHIP FINDINGS& CONCLUSION

There is equalness in the means of Nifty index spot & futures. The NSE spot standard deviation was found to be lesser than futures of NSE. Skewness of both series is found to be with negative skewness which means a long-left tail for both series. For both series kurtosis was found to be more than 3 & positive. Which indicates a highly leptokurtic distribution as compared to normal distribution as compared to normal distribution for both series.

ADF & PP tests statistics at level series indicated the presence of unit root. To make the series stationary 1st difference was used. The Johnsen cointegration test was used to explore the presence of cointegration. At a level of 5% no cointegration was found. Hence it can be said that spot & futures markets are cointegrated. It can be said that in a shorter period of time both the markets move away from each other, but in the longer period of time they move side by side. The error correction term factor was found to be negative for spot market & significant statistically. For futures market it was statistically significant. It means that to restore the equilibrium the futures market also contributes. To eliminate the imbalance the spot and futures markets adjust to themselves.

REFERENCES

[1]. Bhunia, Amalendu, Sanjib Pakira. "Investigating the impact of Gold Price and Exchange Rates on Sensex: An Evidence of India" European Journal of Accounting, Finance & Business, 2.1 (2014):1-11. web. 29 Nov. 2015

[2]. Bollerslev, T. "Generalized Autoregressive Conditional Heteroskedasticity" Journal of Econometrics 31.3 (1986): 307-327.

[3]. Bollerslev, Tim, Ray Y. Chou, and Kenneth F. Kroner. "ARCH Modeling in Finance: A Review of the Theory and Empirical Evidence." Journal of Econometrics (1992):5–59.

[4]. Bhatt, Suyesh N. Security Analysis and Portfolio management.1st edition.131-140. New Delhi. Dreamtech Press, 2011. Print.

[5]. Bollerslev, T. "Generalized Autoregressive Conditional Heteroskedasticity" Journal of Econometrics 31.3 (1986): 307-327.

[6]. Bollerslev, Tim, Ray Y. Chou, and Kenneth F. Kroner. "ARCH Modeling in Finance: A Review of the Theory and Empirical Evidence." Journal of Econometrics (1992):5–59.

[7]. Chandra, Prasanna. Financial Management Theory and Practice.6th edition.443-460.New Delhi. Tata McGraw Hill Publishing Company Limited.2004. Print.

[8]. Dickey, D.A. and W.A. Fuller. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." Journal of the American Statistical Association (1979): 427–431

[9]. Glosten, L. R., R. Jagannathan and D. Runkle. "On the Relation between the Expected Value and the Volatility of the Normal Excess Return on Stocks. Journal of Finance (1993): 1779–1801.

[10]. Granger C.W.J. "Investigating Causal Relations by Econometrics Model and Cross Spectral Methods." Econometrics 37.3 (1969): 424-438.

[11]. Gujrati, Damodar N, Dawn C Porter, Sangeetha Ganasekar. Basic Econometrics. 5th ed. pp 70. N. Delhi. McGraw Hill. Print. MacKinnon,

[12]. Engle, Robert F. "Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of U.K. Inflation." Econometrica (1982): 987–1008.

[13]. Engle, C., und J. Frank "Why interest rates react to money announcements: An Explanation from Foreign Exchange Market",

[14]. Engle, R.F. "Autoregressive Conditional Heteroskedasticity with estimates of the variance of United Kingdom Inflation.", Econometrica 50.4. (1982): 987-1007.

[15]. Engle, Robert F., and Bollerslev, Tim. "Modeling the Persistence of Conditional Variance." Econometric Reviews (1986): 1–50. 68

[16]. Glosten, L.R., R. Jagannathan and D. Runkle. "On the Relation between the Expected Value and the Volatility of the Normal Excess Return on Stocks." Journal of Finance (1993): 1779–18 01.

[17]. Granger C.W.J. "Investigating Causal Relations by Econometrics Model and Cross Spectral Methods." Econometrics 37.3 (1969): 424-438.

[18]. Hussain, Arif, Gohar Zaman and Qadir Buksh Baloch. "The Causal relationship of Interest Rate and Stock Prices: Empirical Evidence from Pakistani Markets." City University Research Journal 4.2 (2014) 147-155.

[19]. Jones, S.T., Banning, K. "US elections and monthly stock market returns". J Econ Finance 33. 273 (2009).

[20]. Leblang ,David , Bumba Mukherjee . "Government Partisanship, Elections, and the Stock Market: Examining American and British Stock Returns 1930–2000" American Journal of Political science. 49 .4 (2005):780-802.

[21]. MacKinnon, James G. "Numerical Distribution Functions for Unit Root and Cointegration Tests." Journal of Applied Econometrics (1996): 601-618.

[22]. James G. "Numerical Distribution Functions for Unit Root and Cointegration Tests." Journal of Applied Econometrics (1996): 601-618.

[23]. Patnaik, Anuradha. "Study of Inflation in India: A Cointegrated Vector autoregression Approach." Journal of Quantitative Economics 8.1. (2010): n.pag. web 16 Nov. 2011.

[24]. Nelson, Daniel B. "Conditional HeterSoskedasticity in Asset Returns: A New Approach." Econometrica (1991): 347–370. 218

[25]. Perron, Pierre and Timothy J. Vogelsang. "Nonstationary and Level Shifts with an Application to Purchasing Power Parity." Journal of Business & Economic Statistics (1992): 301–320.

[26]. Perron, Pierre and Timothy J. Vogelsang. "Testing for a Unit Root in a Time Series with a Changing Mean: Corrections and Extensions." Journal of Business & Economic Statistics (1992): 467–470. 69

[27]. Perron, Pierre. "The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis." Econometrica (1989): 1361-1401.

[28]. [25] Phillips, P.C.B. and P. Perron. "Testing for a Unit Root in Time Series Regression." Biometrika (1988): 335–346.

[29]. [26] Perron, Pierre and Timothy J. Vogelsang.SEC (1992) "Nonstationary and Level Shifts with an Application to Purchasing Power Parity." Journal of Business & Economic Statistics (1992): 301–320.

[30]. Perron, Pierre. "Further Evidence on Breaking Trend Functions in Macroeconomic Variables." Journal of Econometrics (1997): 355– 385.

[31]. Phillips, P.C.B. and P. Perron. "Testing for a Unit Root in Time Series Regression." Biometrika (1988): 335–346.

[32]. ShenaChung-Hua, Chih-Yung Linb. "Betting on presidential Elections: Should We Buy Stocks Connected with the Winning Party?" Finance. (2015) 98-109

[33]. Sathyanarayana, S. & Gargesha, Sudhindra. "Impact of BREXIT Referendum on Indian Stock Market." IRA-International Journal of Management & Social Sciences 5.1 (2016) pp. 12.

Websites
[34]. https://www.bseindia.com
[35]. https://www.nseindia.com
[36]. https://www.wikipedia.org