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NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

THE EMPIRICAL RELATIONSHIP BETWEEN TRADING VOLUME, RETURNS AND VOLATILITY

DR. BAL KRISHAN
PROFESSOR
DEPARTMENT OF COMMERCE
HIMACHAL PRADESH UNIVERSITY
SHIMLA

DR. REKHA GUPTA
ASST. PROFESSOR
GOVERNMENT P. G. COLLEGE
UNA

ABSTRACT

This paper examines the causal and dynamic relationship between stock returns and trading volume for six indices. For this purpose Unit root test, Granger Causality Tests, VAR and GARCH (1,1) have been used. There is strong evidence of asymmetry in the relationship between the volatilities and trading volume; trading volume and volatilities are important in predicting their future dynamics as well as those of the return, but return has a very limited impact on the future dynamics of trading volume. The Granger-causality test shows the evidence of unidirectional causality running from volume to return for almost indices. This study also shows that data related to return, trading volume and volatilities are stationarity. According to GARCH model values of parameters are more than .90. Therefore, weak form efficiency does not exist in Indian stock market. It concludes that lagged trading volume and volatilities contain information which can be useful in predicting current stock returns.

KEYWORDS

stock returns, trading volume, six indices.

INTRODUCTION

In a stock market, relationship between return, volatility and trading volume are more important, because this empirical relationship helps in understanding the competing theories of dissemination of information flow into the market. This may also help in event (informational event/liquidity event) studies by improving the construction of test and its validity. This relationship is also critical in assessing the empirical distribution of returns as many financial models are based on an assumed distribution of return series. Similar to returns and volume, considerable attention has also been given to understand the relationship between volatility and trading volume of an asset by the researchers.

Understanding the relationship between returns, volatility and trading volume in financial markets is equally important for traders, researchers and policy makers. The distribution of returns has implications for various financial models and risk management practices. The dynamic relationship between returns and trading volume helps to understand the market clearing process and frictions in the market. Also, implications trading volume in forecasting volatility help segments like traders, with a very short term investment horizon and many portfolio managers that have a medium to long term investment horizon. In emerging markets, in Indian stock market context specifically, very few empirical studies have been reported on mentioned issues. This paper reports an empirical study for Indian Stock market.

REVIEW OF LITERATURE

There have been number of empirical studies in developed markets that provide evidence on their relationship between trading volume and stock returns. In the sequential information arrival model (arrival model and distribution model), the flow of information to the market participants is considered to be asymmetric (i.e. the new information is not disseminated to all market participants simultaneously); the model allows several intermediate equilibrium positions before the final market equilibrium is reached. Due to this sequential information flow, lagged trading volume may contain information that can be useful in predicting current stock returns and lagged stock returns may contain information that can be useful in predicting current trading volume. This suggests a positive causality between trading volume and stock returns running from either direction. The mixture of distribution model suggests a unidirectional causality from trading volume to stock returns. In this model, Epps (1976) uses trading volume to measure disagreement among traders; investors revise their reservation prices when the new information reaches the market and the level of trading volume increases as the degree of disagreement among market participants widens. Karpoff (1987) provides a comprehensive review of theoretical and empirical work together with reasons for the importance of understanding this relationship. Researchers in this area have examined the volume-price/return relationship in a variety of contexts by employing a range of analytical techniques. Chordia and Swaminathan (2000) examine the interrelationship between trading volume and the predictability of short-term stock returns. They find that daily and weekly returns of high volume portfolios lead returns of low volume portfolios. The authors attribute these findings to the differences in the speed of price adjustment to information between the two types of stocks; stocks in low volume portfolios respond slowly to market-wide information while their high volume counterparts responding promptly to such information. Sarika and Balwinder (2008) found the causality test support the sequentially arrival of information hypothesis, which implies that new information is not simultaneously available to all traders and it takes time to absorb, which hamper the price discovery efficiency of the market. Thus, volume provides information on the precision and dispersion of information signals rather than saving as a proxy for the information signal itself. This paper investigates the causal and dynamic relationship between stock returns and trading volume for six indices.

HYPOTHESIS

To address the objective of the study and after the review of literature, the following hypotheses are formulated and put on test using collected data.

Hypothesis 1: Existence of Unit Root (non stationarity) in stock indices;

Hypothesis 2: No causality is found between returns and volume (return and volatility);

Hypothesis 3: No dynamic relationship is measured between returns and trading volume and volatility and trading volume; and

Hypothesis 4: There is no effect of conditional volatility.

DATA AND RESEARCH METHODOLOGY

This paper investigates the relationship between stock indices trading volume, returns and volume and volatilities. For this purpose the data for the six indices NSE NIFTY (1997 to 2010), BANK NIFTY (2006 to 2010), CNX10001 (2006 to 2010), CNX MIDCAP (2006 to 2010), CNX NIFTY JUNIOR (1997 to 2010) and S&P CNX50001 (1999 to 2010) are retrieved from NSE India website. The dataset used in this study comprises of the daily equity indices and the corresponding trading volume series. Share price of each stock index is obtained as:

$$Share\ price = \frac{P_H + P_L}{2}$$

$$P_H = Highest\ market\ price\ during\ the\ day;$$

$$P_L = Lowest\ market\ price\ during\ the\ day.$$

The **daily return** of the stock markets is calculated as:

$$R_t = ln(P_i - P_{i-1})$$

Following methods are used to test stationarity of time series, causalities and effect of conditional volatility.

Testing for stationarity is done by using both the Augmented Dickey- Fuller and the Phillips-Perron tests. Augmented Dickey –Fuller (ADF) test is most frequently used test of unit root. It is based on simple logic. A non-stationary process has infinite memory as it does not show decay in a shock that takes place in the process. Every random shock carries away the process from its earlier level not to return back again unless another random shock push it towards its previous level. PP Test performs a Phillips-Perron univariate unit root test. This test assumes that the true underlying process is a unit root process with drift. A statistical approach proposed by Clive W Granger (1969) to infer cause and effect relationship between two or more time series is known as Granger causality. Granger Causality is based on the simple logic that effect cannot precede cause. It is important to note that the statement " x Granger causes y " does not imply that y is the effect or the result of x .Granger causality measures precedence and information contents. For causality Test, Gragner test is used. The vector auto regression (VAR) test is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. VAR process assumes that white noise is independently distributed with zero mean. To test the conditional variance effect GARCH (1, 1) is used.

RESULTS

AUGMENTED DICKEY-FULLER TEST

Augmented Dickey-Fuller and Phillips-Perron tests are used to test a time series for stationariy. Augmented Dickey-Fuller test statistic for six indices is presented in table-I. It can be concluded that ADF statistic are significant at one and five per cent level. Null hypotheses about the existence of a unit root can be rejected for all indices, using intercept term and intercept and trend in the test equation at the level form. It reveals that null hypotheses are rejected. It can be concluded that all indices are stationarity in their level forms.

PHILLIPS-PERRON TEST

The Phillips-Perron test provides an alternative way for checking the stationarity of a time series. Table-II shows output related to PP test. This indicates that alternative hypotheses are accepted, statistics are significant at one and five per cent level. It reveals that the time series of various stock indices under study are stationarity at their level form. Both tests are supporting the stationarity of indices.

GRANGER CAUSALITY TEST

Granger Causality Test involves examining the short run cause and effect relationship. The results of this test are summarized in table-III. It depicts that returns are insignificantly affected by trading volume of almost indices (except CNX MID CAP), but trading volume has significant effect on return up to one day lag. But it presents different results, when analysis is done on volatility and trading volume. It states the two-way causality between volatility and trading volume of all indices. It can be said that preceding information related to return volatility (trading volume) has significant effect.

VECTOR AUTO REGRESSION MODEL

VAR test has been used for testing the effect of lagged variables such as return (volatility) and trading volume. The results of this model are presented in table-IV. It depicts that trading volume of NSE Nifty, CNX 10001, CNX MID, CNX NIFTY JUNIOR and S&P CNX 50001 have significant effect on returns up to one day lag. Thus, trading volume is also significantly affected by return (CNX MID CAP, BANK NIFTY AND CNX NIFTY JUNIOR). It reveals that there is lagged relationship between these two variables.

The autoregressive coefficient of volatilities on past volume and autoregressive coefficient of volume on past volatilities are also presented in table-IV. It indicates that trading volume and volatility have significant effect of six indices up to one day lag. These results provide evidence that in Indian market, information is processed sequentially.

GARCH MODEL

In order to investigate the effect of trading volume and conditional volatilities, time series of all stock returns are using GARCH (1, 1) model with a volume parameter in the mean equation. The results of this model are reported in table-V. It reveals that coefficient of trading volume is positive, but significant only in case of CNX1001 and CNX MID CAP. Further significant ARCH and GARCH coefficient indicate that conditional variance is affected by lagged variance, which implies that previous information shocks significantly affect current return. It also shows that parameters are positive and significant at one and five per cent level, the sum of parameters of all indices are greater than 0.90.

Further, GARCH (1, 1) is also studied in case of volume and volatilities relationship which is presented in table-V. It shows that there is positive impact of trading volume and parameters are positive and significant. It reveals that Indian stock market is not efficient in weak form.

CONCLUSION

This study investigates relationship between the stock price and trading volume. The findings of the present study are as follows:

- Data of all indices are stationarity.
- The findings indicate a statistically significant causality running from trading volume to return for NSE Nifty, CNX 10001, CNX Mid, CNX Nifty junior and S&P CNX 50001. On the other hand, a significant causal effect from stock returns to trading volume is detected only for CNX MID CAP, BANK NIFTY AND CNX NIFTY JUNIOR.
- The results of relation between trading volume and conditional volatility support strong contemporaneous relationship between trading volume and conditional volatility. It indicates that parameter related to ARCH and GARCH are significant and more than 0.90. Therefore, the trading volume is a better proxy of information than the return itself.

On comparing the present study with the previous studies (Blume), it has been found that there is quite variation in the results. The results of this study fully support the Epps model.

REFERENCES

1. Epps, T.W., and Epps, M.L. (1976), "The stochastic dependence of security price changes and transaction volumes: implications for the Mixture-of-distributions hypothesis" Econometrica, 44: 305-321.
2. Karpoff, J.M. (1987), "The relations between price changes and trading volume: A survey), Journal of Financial and Quantitative Analysis, 22: 109-126.
3. Sarika and Balwinder (2008), "An empirical analysis of stock price-volume relationship in Indian stock market", Vision, pp. 1-13.
4. Swaminathan, (2000), "Price momentum and Trading Volume", The Jounal of Finance, 55.5, pp.1017-1069.

TABLES

TABLE I: UNIT ROOT TEST RESULTS

Augmented Dickey-Fuller test

Variables	Return		Volume		Volatility	
	Statistic	p value	Statistic	p value	Statistic	p value
with constant	-27.5566	0	-2.6166	0.0897	-13.8666	0
with constant and trend	-27.5637	0	-3.57437	0.0322	-13.9158	0
with constant	-25.6746	0	-2.87581	0.0485	-18.029	0
with constant and trend	-25.6719	0	-4.52881	0.0014	-18.0273	0
with constant	-27.5686	0	-3.87278	0.0023	-21.7908	0
with constant and trend	-27.5614	0	-4.53801	0.0013	-21.8023	0
with constant	-27.0517	0	-3.54911	0.007	-19.8809	0
with constant and trend	-27.0573	0	-6.85413	0	-19.9188	0
with constant	-29.9117	0	-3.08659	0.0277	-12.6827	0
with constant and trend	-29.908	0	-5.28906	0	-12.6842	0
with constant	-35.3006	0	-2.88494	0.0472	-28.1761	0
with constant and trend	-35.2966	0	-5.04899	0.0002	-28.175	0

TABLE II: UNIT ROOT TEST RESULTS
PHILLIPS-PERRON TEST

	Variables	Return		Volume		Volatility	
		Statistic	p value	Statistic	p value	Statistic	p value
NSE NIFTY	with constant	-38.0088	0	-11.5809	0	-41.33	0
	with constant and trend	-37.9463	0	-21.4595	0	-41.2546	0
BANK NIFTY	with constant	-25.3705	0	-13.1634	0	-26.3588	0
	with constant and trend	-25.3714	0	-15.7125	0	-26.3504	0
CNX10001	with constant	-27.5569	0	-9.58211	0	-22.7189	0
	with constant and trend	-27.5437	0	-12.828	0	-22.7174	0
CNX MIDCAP	with constant	-27.0931	0	-11.8965	0	-19.7506	0
	with constant and trend	-27.0917	0	-15.7179	0	-19.7879	0
CNX NIFTY JUNIOR	with constant	-44.5331	0.0001	-9.55507	0	-47.4581	0.0001
	with constant and trend	-44.5268	0	-25.3097	0	-47.4467	0
S&P CNX 50001	with constant	-42.472	0	-6.64107	0	-44.4229	0.0001
	with constant and trend	-42.4651	0	-20.8054	0	-44.413	0

TABLE III: GRANGER CAUSALITY RESULTS

VARIABLES	NULL HYPOTHESIS	F-STATISTIC	P-VALUE	NULL HYPOTHESIS	F-STATISTIC	P-VALUE
NSE NIFTY	V does not Granger Cause R	0.58943	0.4427	V does not Granger Cause R*R	19.8535**	9.00E-06
	R does not Granger Cause V	21.9587**	3.00E-06	R*R does not Granger Cause V	7.36249**	0.0067
BANK NIFTY	V does not Granger Cause R	3.59219	0.0583	V does not Granger Cause R*R	33.5508	9.00E-09
	R does not Granger Cause V	0.41685	0.5186	R*R does not Granger Cause V	49.3849	4.00E-12
CNX10001	V does not Granger Cause R	1.49939	0.221	V does not Granger Cause R*R	7.84482	0.0052
	R does not Granger Cause V	32.3454**	2.00E-08	R*R does not Granger Cause V	43.4875	7.00E-11
CNX MIDCAP	V does not Granger Cause R	7.4245**	0.0065	V does not Granger Cause R*R	0.65303	0.4192
	R does not Granger Cause V	18.2498**	2.00E-05	R*R does not Granger Cause V	5.64092	0.0177
CNX NIFTY JUNIOR	V does not Granger Cause R	2.58063	0.1083	V does not Granger Cause R*R	7.65915	0.0057
	R does not Granger Cause V	11.4641**	0.0007	R*R does not Granger Cause V	10.1638	0.0014
S&P CNX 50001	V does not Granger Cause R	1.33599	0.2478	V does not Granger Cause R*R	6.24317	0.0125
	R does not Granger Cause V	47.8989**	6.00E-12	R*R does not Granger Cause V	71.678	4.00E-17

V-VOLUME
R-RETURN
R*R-VOLATILITY

TABLE IV: VECTOR AUTOREGRESSION ESTIMATES

t-statistics in [ ]

		R	V		R*R	V			R	V		R*R	V
NSE NIFTY	R(-1)	0.314726	1.72E+08	R*R(-1)	0.331683	3.88E+09	BANK NIFTY	R(-1)	0.271425	1617233	R*R(-1)	0.258289	1.09E+09
		[16.0350]	[4.05114]		[16.9106]	[4.23112]			[8.99440]	[0.19252]		[8.54027]	[7.06778]
	R(-2)	-0.13598	7336790	R*R(-2)	0.055003	########		R(-2)	-0.08106	5560613	R*R(-2)	0.042521	########
		[-6.58187]	[0.16387]		[2.66477]	[-0.55235]			[-2.59656]	[0.63991]		[1.33730]	[-2.44779]
	R(-3)	0.043613	-1.4E+07	R*R(-3)	-0.01631	4.03E+08		R(-3)	0.049931	-1.5E+07	R*R(-3)	-1.62E-02	1.75E+08
		[2.09539]	[-0.30388]		[-0.79041]	[0.41749]			[1.59660]	[-1.66889]		[-0.50821]	[1.07463]
	R(-4)	-0.00013	11807455	R*R(-4)	0.069809	########		R(-4)	-0.05678	-1.2E+07	R*R(-4)	5.85E-02	########
		[-0.00613]	[0.26413]		[3.39013]	[-2.47925]			[-1.81883]	[-1.34840]		[1.83338]	[-1.87682]
	R(-5)	-0.03748	2099382	R*R(-5)	0.038407	########		R(-5)	-0.05676	-1916111	R*R(-5)	-1.81E-02	########
		[-1.90680]	[0.04929]		[1.95583]	[-1.57758]			[-1.88220]	[-0.22825]		[-0.58669]	[-1.98026]
	V(-1)	-3.11E-12	0.502973	V(-1)	1.37E-12	0.493734		V(-1)	2.15E-10	0.403816	V(-1)	1.45E-11	0.410418
		[-0.34752]	[25.9134]		[3.29259]	[25.4424]			[2.01770]	[13.6142]		[2.50707]	[13.8883]
	V(-2)	6.97E-12	0.101384	V(-2)	-1.12E-13	0.096116		V(-2)	-1.92E-10	0.188765	V(-2)	3.16E-12	0.162146
		[0.69595]	[4.67099]		[-0.24326]	[4.45000]			[-1.66266]	[5.87936]		[0.50297]	[5.04768]
	V(-3)	2.86E-12	0.09142	V(-3)	-8.73E-13	0.097724		V(-3)	1.39E-10	0.098651	V(-3)	7.99E-13	0.10914
		[0.28548]	[4.20810]		[-1.88912]	[4.52483]			[1.18757]	[3.03579]		[0.12628]	[3.37752]
	V(-4)	2.82E-12	0.100566	V(-4)	6.45E-13	0.108356		V(-4)	4.72E-11	0.042895	V(-4)	-1.41E-13	0.043561
		[0.28178]	[4.63176]		[1.39488]	[5.01137]			[0.40870]	[1.33456]		[-0.02247]	[1.36055]
	V(-5)	-5.14E-12	0.167997	V(-5)	-5.25E-13	0.169891		V(-5)	-1.27E-10	0.196543	V(-5)	-1.84E-12	0.199143
		[-0.57417]	[8.66566]		[-1.26748]	[8.77636]			[-1.19480]	[6.62500]		[-0.32553]	[6.88382]
	C	-9.01E-05	3925424	C	5.77E-05	3878217		C	-0.00076	1329910	C	4.40E-05	1299178
		[-0.18573]	[3.73253]		[2.55534]	[3.67420]			[-0.56211]	[3.54855]		[0.61427]	[3.55197]
CNX10001	R(-1)	0.201016	5.03E+08	R*R(-1)	0.404418	1.44E+10	CNX MIDCAP	R(-1)	0.194589	1.54E+08	R*R(-1)	0.506734	1.84E+09
		[6.62148]	[4.68869]		[13.3013]	[7.32829]			[6.43335]	[4.73581]		[16.7515]	[3.16929]
	R(-2)	-0.07136	2.06E+08	R*R(-2)	-0.02676	########		R(-2)	-0.03925	51164291	R*R(-2)	-0.07599	########
		[-2.27722]	[1.85603]		[-0.79479]	[-2.96537]			[-1.26384]	[1.52872]		[-2.23318]	[-1.32777]
	R(-3)	0.027128	-7.5E+07	R*R(-3)	0.00823	3.92E+09		R(-3)	0.043542	-3.8E+07	R*R(-3)	5.11E-03	########
		[0.86322]	[-0.67279]		[0.24353]	[1.79093]			[1.40562]	[-1.12885]		[0.14986]	[-0.31895]
	R(-4)	-0.03258	1.26E+08	R*R(-4)	0.081393	########		R(-4)	-0.00843	41325578	R*R(-4)	5.99E-02	########
		[-1.03865]	[1.13203]		[2.41367]	[-2.11387]			[-0.27240]	[1.23931]		[1.76284]	[-0.40935]
	R(-5)	-0.05138	-4.7E+07	R*R(-5)	-0.01649	########		R(-5)	-0.04091	-3.3E+07	R*R(-5)	-0.02553	########
		[-1.67104]	[-0.43087]		[-0.53133]	[-0.82684]			[-1.34637]	[-0.99483]		[-0.84149]	[-1.21723]
	V(-1)	1.52E-11	0.493455	V(-1)	1.75E-12	0.515708		V(-1)	1.04E-10	0.47098	V(-1)	4.04E-12	0.48786
		[1.78097]	[16.3834]		[3.76246]	[17.1095]			[3.71938]	[15.5860]		[2.56325]	[16.1585]
	V(-2)	-7.03E-12	0.130732	V(-2)	-1.03E-12	0.083126		V(-2)	-1.24E-11	0.193928	V(-2)	-3.18E-12	0.196972
		[-0.74077]	[3.89372]		[-1.95219]	[2.43514]			[-0.40135]	[5.82783]		[-1.81665]	[5.86648]
	V(-3)	-1.37E-12	0.068657	V(-3)	-5.09E-13	0.112528		V(-3)	-2.71E-11	0.048947	V(-3)	-1.32E-12	0.05741
		[-0.14374]	[2.03553]		[-0.96532]	[3.29814]			[-0.86537]	[1.45177]		[-0.74093]	[1.68387]
	V(-4)	2.23E-12	0.11211	V(-4)	7.79E-13	0.095958		V(-4)	6.60E-12	0.111917	V(-4)	1.78E-12	1.04E-01
		[0.23535]	[3.34203]		[1.48218]	[2.82192]			[0.21421]	[3.37067]		[1.01861]	[3.08779]
	V(-5)	-4.84E-12	0.132256	V(-5)	-6.52E-13	0.130958		V(-5)	-4.77E-11	0.070154	V(-5)	-1.40E-12	0.05855
		[-0.57046]	[4.40711]		[-1.42278]	[4.42029]			[-1.71382]	[2.33746]		[-0.88937]	[1.94516]
	C	-0.00069	17339003	C	9.04E-05	15503245		C	-0.00148	8517667	C	0.000188	7982406
		[-0.51519]	[3.67388]		[1.25491]	[3.32494]			[-0.95993]	[5.14052]		[2.17987]	[4.82918]
CNX NIFTY JUNIOR	R(-1)	0.273258	85329984	R*R(-1)	0.332653	1.80E+09	S&P CNX 50001	R(-1)	0.229471	5.23E+08	R*R(-1)	0.286734	1.10E+10
		[15.7786]	[4.33659]		[19.2085]	[4.68278]			[12.1343]	[7.44342]		[15.0613]	[8.02306]
	R(-2)	-0.09787	18951385	R*R(-2)	0.083137	########		R(-2)	-0.07753	2.52E+08	R*R(-2)	0.067266	########
		[-5.44008]	[0.92715]		[4.55516]	[-1.87280]			[-3.96014]	[3.45798]		[3.35067]	[-0.74550]
	R(-3)	0.060806	-1.3E+07	R*R(-3)	-0.00283	2.49E+08		R(-3)	0.046468	-1E+07	R*R(-3)	0.010977	########
		[3.37404]	[-0.64712]		[-0.15469]	[0.61231]			[2.36698]	[-0.13913]		[0.54588]	[-0.26781]
	R(-4)	-7.31E-05	23503180	R*R(-4)	0.071735	########		R(-4)	0.010735	98010995	R*R(-4)	0.057469	########
		[-0.00407]	[1.15228]		[3.93053]	[-2.42514]			[0.54832]	[1.34676]		[2.86635]	[-2.16529]
	R(-5)	-0.01816	-3.5E+07	R*R(-5)	0.024458	########		R(-5)	-0.03455	-7.5E+07	R*R(-5)	0.024357	########
		[-1.04931]	[-1.77772]		[1.40757]	[-1.23527]			[-1.81017]	[-1.05279]		[1.26636]	[-1.63712]
	V(-1)	6.32E-11	0.577108	V(-1)	1.96E-12	0.578834		V(-1)	1.05E-11	0.498813	V(-1)	8.74E-13	0.523928
		[4.17133]	[33.5262]		[2.53058]	[33.6140]			[2.08672]	[26.5805]		[3.32298]	[27.7278]
	V(-2)	-2.64E-11	0.134832	V(-2)	-7.60E-13	0.134427		V(-2)	-5.19E-12	0.157711	V(-2)	-5.65E-13	0.145334
		[-1.50657]	[6.78174]		[-0.84914]	[6.76012]			[-0.92416]	[7.56013]		[-1.90385]	[6.81903]
	V(-3)	-2.11E-11	0.067119	V(-3)	-8.94E-13	0.071916		V(-3)	-3.73E-13	0.049221	V(-3)	-1.47E-13	0.056941
		[-1.20051]	[3.35770]		[-0.99296]	[3.59841]			[-0.06595]	[2.33822]		[-0.49086]	[2.65153]
	V(-4)	9.65E-12	0.076425	V(-4)	7.51E-13	0.072566		V(-4)	3.11E-12	0.140942	V(-4)	2.34E-13	0.131594
		[0.55127]	[3.84208]		[0.83819]	[3.64924]			[0.55463]	[6.75584]		[0.78614]	[6.16572]
	V(-5)	-2.17E-11	0.108777	V(-5)	-6.10E-13	0.107531		V(-5)	-6.77E-12	0.127777	V(-5)	-2.88E-13	0.118323
		[-1.43044]	[6.31339]		[-0.78895]	[6.26537]			[-1.34259]	[6.82006]		[-1.09999]	[6.29610]
	C	0.000347	2013570	C	0.000141	2070035		C	0.000162	6712062	C	0.000118	5647414
		[0.78484]	[4.00707]		[5.96439]	[3.95762]			[0.30618]	[3.41805]		[4.20424]	[2.80597]

TABLE V: GARCH (1,1)

Dependent Variable: RETURN and independent variable lag returns (1) and lag TRADING VOLUME (1 – 5)					Dependent Variable: VOLATILITY and independent variable lag VOLATILITY (1) and lag TRADING VOLUME(1 – 5)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.	Variable	Coefficient	Std. Error	z-Statistic	Prob.
NSE NIFTY									
C	0.000673	0.000348	1.931602	0.0534	C	5.77E-05	6.52E-05	0.884574	0.3764
R(-1)	0.283832	0.018642	15.22522	0	RR(-1)	0.331683	0.098526	3.366467	0.0008
V(-1)	4.23E-12	7.03E-12	0.601834	0.5473	V(-1)	1.34E-12	6.27E-12	0.214304	0.8303
V(-2)	6.16E-12	8.85E-12	0.695583	0.4867	V(-2)	-1.18E-13	6.49E-12	-0.01823	0.9855
V(-3)	-2.24E-12	9.36E-12	-0.23902	0.8111	V(-3)	-8.68E-13	1.06E-11	-0.0816	0.935
V(-4)	-3.45E-12	9.43E-12	-0.36622	0.7142	V(-4)	6.42E-13	1.13E-11	0.05689	0.9546
V(-5)	-1.03E-12	7.65E-12	-0.13432	0.8932	V(-5)	-5.22E-13	9.23E-12	-0.05655	0.9549
Variance Equation					Variance Equation				
C	6.99E-06	1.04E-06	6.694926	0	C	2.74E-07	4.77E-08	5.757176	0
RESID(-1)^2	0.21871	0.014582	14.99884	0	RESID(-1)^2	0.15	0.031795	4.71773	0
GARCH(-1)	0.757761	0.017538	43.20614	0	GARCH(-1)	0.6	0.067465	8.893464	0
BANK NIFTY									
C	0.001602	0.000591	2.708939	0.0067	C	0.000308	1.03E-05	29.89529	0
R(-1)	0.260862	0.02861	9.117713	0	VA(-1)	0.400266	0.025605	15.63207	0
VA(-1)	0.623282	1.050903	0.593092	0.5531	VO(-1)	5.82E-12	1.29E-12	4.51347	0
VA(-2)	0.177401	1.017258	0.174391	0.8616	VO(-2)	-5.57E-12	1.35E-12	-4.11299	0
VA(-3)	-0.66311	1.130364	-0.58663	0.5575	VO(-3)	-9.44E-12	1.18E-12	-7.97553	0
VA(-4)	0.127459	1.011747	0.125979	0.8997	VO(-4)	-2.38E-12	1.15E-12	-2.0618	0.0392
VA(-5)	-0.14622	1.125909	-0.12987	0.8967	VO(-5)	-3.87E-12	1.33E-12	-2.90312	0.0037
Variance Equation					Variance Equation				
C	1.06E-05	2.86E-06	3.711239	0.0002	C	9.95E-10	1.59E-09	0.624458	0.5323
RESID(-1)^2	0.179643	0.021799	8.240858	0	RESID(-1)^2	1.907163	0.057069	33.41862	0
GARCH(-1)	0.814454	0.020987	38.80796	0	GARCH(-1)	0.495384	0.007349	67.40583	0
CNX10001									
C	0.001517	0.000869	1.745292	0.0809	C	9.20E-05	0.000151	0.608768	0.5427
R(-1)	0.229796	0.029514	7.785975	0	VA(-1)	0.400587	0.134236	2.984195	0.0028
V(-1)	1.27E-11	6.05E-12	2.10574	0.0352	V(-1)	1.64E-12	7.05E-12	0.232593	0.8161
V(-2)	-2.93E-12	7.61E-12	-0.38537	0.7	V(-2)	-1.01E-12	1.37E-11	-0.07349	0.9414
V(-3)	-9.43E-12	7.91E-12	-1.19244	0.2331	V(-3)	-3.46E-13	1.56E-11	-0.02218	0.9823
V(-4)	5.94E-12	7.08E-12	0.838478	0.4018	V(-4)	5.42E-13	2.20E-11	0.024649	0.9803
V(-5)	-6.72E-12	6.35E-12	-1.05755	0.2903	V(-5)	-5.77E-13	2.25E-11	-0.02571	0.9795
Variance Equation					Variance Equation				
C	6.38E-06	1.67E-06	3.822605	0.0001	C	6.17E-07	1.25E-07	4.938036	0
RESID(-1)^2	0.250704	0.02368	10.58717	0	RESID(-1)^2	0.15	0.034817	4.308274	0
GARCH(-1)	0.762749	0.022472	33.94275	0	GARCH(-1)	0.6	0.077502	7.741706	0
CNX MIDCAP									
C	0.002101	0.000907	2.316362	0.0205	C	5.44E-05	1.04E-05	5.24504	0
SERIES01(-1)	0.208078	0.032324	6.43727	0	SERIES03(-1)	0.473558	0.041721	11.35053	0
SERIES02(-1)	4.67E-11	1.93E-11	2.423512	0.0154	SERIES02(-1)	-8.80E-13	2.57E-13	-3.42354	0.0006
SERIES02(-2)	1.47E-11	2.03E-11	0.722403	0.47	SERIES02(-2)	7.11E-13	3.53E-13	2.012137	0.0442
SERIES02(-3)	-4.70E-11	1.75E-11	-2.6932	0.0071	SERIES02(-3)	-1.31E-12	3.85E-13	-3.40439	0.0007
SERIES02(-4)	7.19E-12	1.97E-11	0.365115	0.715	SERIES02(-4)	5.64E-13	2.31E-13	2.440211	0.0147
SERIES02(-5)	-2.63E-11	1.79E-11	-1.4713	0.1412	SERIES02(-5)	9.18E-13	1.83E-13	5.010849	0
Variance Equation					Variance Equation				
C	8.76E-06	2.19E-06	3.994918	0.0001	C	2.58E-08	1.24E-09	20.77307	0
RESID(-1)^2	0.306522	0.031114	9.851617	0	RESID(-1)^2	2.188296	0.066769	32.77411	0
GARCH(-1)	0.706557	0.025327	27.89688	0	GARCH(-1)	0.308906	0.010521	29.35983	0
CNX NIFTY JUNIOR									
C	0.001101	0.000246	4.480098	0	C	7.67E-05	2.98E-06	25.6919	0
R(-1)	0.267961	0.017859	15.00466	0	VA(-1)	0.358345	0.015028	23.84592	0
VA(-1)	0.447071	0.656529	0.680961	0.4959	VO(-1)	1.50E-13	1.33E-13	1.123685	0.2611
VA(-2)	0.945858	0.738191	1.281318	0.2001	VO(-2)	-1.06E-12	1.56E-13	-6.80258	0
VA(-3)	0.635843	0.703737	0.903524	0.3662	VO(-3)	-1.25E-12	1.80E-13	-6.90943	0
VA(-4)	-0.9947	0.714456	-1.39225	0.1638	VO(-4)	1.97E-12	1.55E-13	12.69614	0
VA(-5)	-0.09333	0.686028	-0.13604	0.8918	VO(-5)	5.42E-14	1.25E-13	0.43538	0.6633
Variance Equation					Variance Equation				
C	8.06E-06	1.12E-06	7.178415	0	C	1.09E-08	3.42E-10	31.91224	0
RESID(-1)^2	0.206142	0.0136	15.15792	0	RESID(-1)^2	1.215973	0.022654	53.67494	0
GARCH(-1)	0.780556	0.013592	57.42706	0	GARCH(-1)	0.50734	0.005554	91.35233	0
S&P CNX 50001									
C	0.001339	0.000239	5.611245	0	C	0.000142	7.16E-05	1.988379	0.0468
R(-1)	0.23086	1.91E-02	1.21E+01	0	VA(-1)	0.319564	0.080822	3.953928	0.0001
VA(-1)	0.578375	0.86686	0.667208	0.5046	VO(-1)	1.03E-12	8.11E-12	0.126869	0.899
VA(-2)	0.794707	9.23E-01	8.61E-01	0.3892	VO(-2)	-6.98E-13	1.07E-11	-0.06546	0.9478
VA(-3)	0.443599	0.771689	0.574841	0.5654	VO(-3)	7.52E-15	1.46E-11	0.000517	0.9996
VA(-4)	-1.03462	0.850514	-1.21646	0.2238	VO(-4)	1.46E-13	1.53E-11	0.009505	0.9924
VA(-5)	0.180756	0.785644	0.230074	0.818	VO(-5)	-3.42E-13	1.54E-11	-0.02214	0.9823
Variance Equation					Variance Equation				
C	7.68E-06	9.85E-07	7.792479	0	C	4.45E-07	5.75E-08	7.73439	0
RESID(-1)^2	0.221488	0.012815	17.28351	0	RESID(-1)^2	0.15	0.024356	6.158589	0
GARCH(-1)	0.765754	0.014338	53.4072	0	GARCH(-1)	0.6	0.05143	11.66645	0

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