Chapter-6

Volatility and Industrial Profitability

The factors that result in volatility can be classified into two types' macro and micro factors. Macro level factors affect the whole economic structure of the economy, and thereby, the behavior of the stock market. The impact of these factors clearly gets reflected in the stock market in terms of volatility. These factors include inflation rate, index of industrial production, foreign institutional investment, the exchange rate, union budget, imports growth rate, tax system, interest rate, current account deficit, money supply and foreign currency reserves etc. There are number of factors which result in either rise or fall of stock prices or in other words lead to volatility. Micro factors are specific, like dividend yields, price earnings ratio, price to book value, shares traded, major expansion plans, earning per share, company size and book value per share have significant impact upon the value of the stock of that company. But present study is confined to the following factors:

Macro Factors: whole sale price index, index of industrial production, exchange rate, calls money rate, trade balance and net foreign institutional investment.

Micro Factors: price earnings ratio, price to book value, dividend yields and shares traded.

This chapter also discusses the relationship between stock market volatility and profitability of the selected sectors. The study here tries to examine whether change in profitability has any impact on stock market volatility. This chapter is divided into two sections; viz. section 6.1 and section 6.2. Section 6.1 deals with the stock market volatility and its responsible factors and Section 6.2 shows the relationship between stock market volatility and industrial Profitability.

6.1 Stock Market Volatility and Its Responsible Factors:

To analyze the long run relationship and short run dynamic interaction among the variables of interest the OLS based Autoregressive Distributed Lag (ARDL) co-integration approach is used. The ARDL model used in this study (already mentioned in the methodology section of Chapter 3) is expressed as follows:

$$
\begin{aligned}
D(ln(\text{CV}))_t = {} & \beta_1 + \beta_2 \ln(CV)_{t-1} + \beta_3 \ln(CMR)_{t-1} + \beta_4 \ln(ER)_{t-1} + \beta_5 \ln(IIP)_{t-1} \\
& + \beta_6 \ln(TV)_{t-1} + \beta_7 \ln(WPI)_{t-1} + \beta_8 (Net\ FII)_{t-1} + \beta_9 \left(\frac{P}{B}\right)_{t-1} \\
& + \beta_{10} (Div.Yield)_{t-1} + \beta_{11} \left(\frac{P}{E}\right)_{t-1} + \beta_{12} (\text{TB})_{t-1} \\
& + \sum_{i=1}^{p} \gamma_{1i}\, D(ln(\text{CV}))_{t-i} + \sum_{i=0}^{q} \gamma_{2i}\, D(ln(\text{CMR}))_{t-i} + \sum_{i=0}^{q} \gamma_{3i}\, D(ln(\text{ER}))_{t-i} \\
& + \sum_{i=0}^{q} \gamma_{4i}\, D(ln(\text{IIP}))_{t-i} + \sum_{i=0}^{q} \gamma_{5i}\, D(ln(\text{ST}))_{t-i} + \sum_{i=0}^{q} \gamma_{6i}\, D(ln(\text{WPI}))_{t-i} \\
& + \sum_{i=0}^{q} \gamma_{7i}\, D(\text{Net FII})_{t-i} + \sum_{i=0}^{q} \gamma_{8i}\, D\left(\frac{\text{P}}{\text{B}}\right)_{t-i} + \sum_{i=0}^{q} \gamma_{9i}\, D(\text{Div. Yield})_{t-i} \\
& + \sum_{i=0}^{q} \gamma_{10i}\, D\left(\frac{\text{P}}{\text{E}}\right)_{t-i} + \sum_{i=0}^{q} \gamma_{11i}\, (TB)_{t-i} + \varepsilon_t \qquad \dots\dots \quad (7)
\end{aligned}
$$

Where, D denotes the first difference operator,

β_1 is the drift component,

ε_t is the usual white noise residuals.

CV = Conditional Variance

CMR = Call Money Rate

IIP = Index of Industrial Production

ER = Exchange Rate

TV = Trading Volume

WPI = Wholesale Price Index

Net FII= Net Foreign Institutional Investment

P/B = Price to Book value

Div. Yields = Dividend Yields

P/E = Price Earnings Ratio

This section is also divided into three sub sections; viz. 6.1.1 unit root test, 6.1.2 bound test for co-integration analysis and 6.1.3 diagnostic test for ARDL model.

6.1.1 Unit Root Test:

Although the ARDL co-integration approach does not require unit root test, nevertheless we need to conduct this test to ensure that none of the variables are the integrated of order 2, i.e., I(2), because in case of I(2) variables, ARDL procedure makes no sense. If a variables is found to be I(2), then the computed F-statistics as produced by Pesaran et al. (2001) and Narayan (2005) can no longer be valid. Therefore, the study here employs the Augmented Dickey-Fuller test to check whether any variable is integrated of order 2. The result of ADF test is reported in Table 6.1.1.

From Table 6.1.1, it is observed that the Augmented Dickey-Fuller test statistic for ln(CMR), ln(IIP), Net FII, P/B and P/E are greater than their critical values at less than five percent level of significance at level. Therefore, we reject the null hypothesis that the variables have a unit root at level. This implies that data of the concerned variables are stationary at level. However, the ADF-statistics for ln(CV), ln(ER), ln(TV) ln(WPI) and Div. Yield are too low to reject the null hypothesis that the variables have a unit root at level. However, once the first differences of the variables are considered, the null hypothesis of unit root is rejected. Thus, we have clear evidence that the variables under consideration are co-integrated but in different orders. When the order of integration is different but not integrated of order 2 we can apply the autoregressive distributed lag (ARDL) model for co-integration analysis.

Table 6.1.1: Augmented Dickey Fuller Unit Root Test

Variables	At Level		First Difference		Integrated of Order
	ADF test Statistic	P-Value	ADF test Statistic	P-Value	
ln(CV)	0.20	0.97	-11.34	0.00	I(1)
ln(CMR)	-4.14	0.00	-10.05	0.00	I(0)
ln(ER)	-0.50	0.89	-7.46	0.00	I(1)
ln(IIP)	-2.94	0.04			I(0)
ln(TV)	-2.00	0.28	-13.11	0.00	I(1)
ln(WPI)	-1.78	0.39	-10.65	0.00	I(1)
Net FII	-7.51	0.00			I(0)
P/B	-10.04	0.00			I(0)
DY	-2.40	0.14	-9.78	0.00	I(1)
P/E	-2.99	0.04			I(0)
TB					

Test critical values		
1% level	5% level	10% level
-3.49	-2.89	-2.58

Source: Estimated by Author, data collected from Handbook of Indian Statistics www.rbi.org.in

6.1.2 Bound Test for Co-integration Analysis:

To investigate the presence of long-run relationships among the variables bound testing procedure is used, Pesaran, et al. (2001) which is already mentioned in the methodology section in Chapter 3. The bound testing procedure is based on the F-test. The F-test is actually a test of the hypothesis of non-existence of long run relationship among the variables against the existence or presence of long run relationship among the variables.

Table: 6.1.2 ARDL Bounds Test (with intercept but no trend) for Co-integration Analysis

Included observations: 114 ;	Null Hypothesis: No long-run relationships exist	
Test Statistic	Value	K (no, of Regressors)
F-statistic	4.85	9
Critical Value Bounds		
Significance	I(0)Bound	I(1) Bound
10%	2.12	3.23
5%	2.45	3.61
1%	3.15	4.43

Source: Estimated by Author, data collected from Handbook of Indian Statistics www.rbi.org.in

From Table 6.1.2, it is observed that the calculated F-statistic (with intercept but no trend) is 4.85, which is greater than the upper bound critical values at one percent level of significance. Thus we reject the null hypothesis of non existence of long run relationship among the variables. This implies that there exists long run relationship among the variables.

From Table 6.1.3, it is observed that the coefficient of exchange rate is statistically insignificant. This implies that change in exchange rate has no statistically significant effect on stock market volatility in the long run.

The coefficient of WPI is negative and statistically significant at one per cent level of significance. This implies that WPI negatively affect the stock market volatility in the long run. A unit increase in WPI leads to approximately 7.3 per cent decrease in volatility.

The coefficient of CMR is positive and statistically significant at less than five per cent level of significance. This implies that in the long run CMR and stock market volatility move in the same direction. One percent increase in CMR leads to approximately 0.66 percent increase in volatility.

Table 6.1.3: Estimated Long Run Coefficients using the ARDL Approach

Dependent Variable: LN(CV) ; Method: ARDL				
Sample (adjusted): 2005M07 - 2014M12				
Included observations: 114 after adjustments				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Akaike information criterion (AIC)				
Dynamic regressors (4 lags, automatic): LN(ER) LN(WPI) LN(IIP) (NET FII) (P/E) (P/B)				
Fixed regressors: LN(CMR) LN(ST) (DY) (TB) C				
Number of models evaluated: 62500				
Selected Model: ARDL (4, 1, 4, 1, 1, 2, 4)				
Estimated Long Run Coefficients using the ARDL Approach				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
LN(ER)	-2.442	1.945	-1.255	0.213
LN(WPI)	-7.302	1.832	-3.985	0.000***
LN(IIP)	2.880	2.048	1.406	0.163
NET FII	-0.002	0.001	-1.165	0.247
P/E	-0.012	0.086	-0.139	0.890
P/B	-0.095	0.166	-0.572	0.569
LN(CMR)	0.665	0.303	2.191	0.031**
LN(TV)	0.789	0.232	3.410	0.001***
DY	0.507	0.855	0.593	0.555
TB	-0.001	0.000	-1.986	0.050**

Source: Estimated by Author, data collected from Handbook of Indian Statistics www.rbi.org.in
***denotes 1% level of significance & ** denotes 5% level of significance

The coefficient of trading volume (TV) is also positive (as expected) and statistically significant at one per cent level of significance. This implies that stock market will be more volatile as the more number of shares traded in the market. This may be due to the fact that when more shares are traded than stock prices are changing rapidly.

The coefficient of trade balance (TB) is negative and statistically significant at five per cent level of significance. This indicates that as the trade balance decreases the volatility in the stock market rises. Since trade balance is the difference of export and import. Therefore, decrease in trade balance implies rise in export. Rise in export may be due to rise in production, which may be due to higher investment. Higher investment in stock market may be leads to higher volatility.

However, the coefficient of exchange rate (ER), index of industrial production (IIP), net foreign institutional investment (Net FII), price earnings ratio (P/E), price to book value (PB) and dividend yield (DY) are statistically insignificant. This indicates that these variables have no statistically significance affect on stock market volatility in the long run.

The result of the short run dynamic coefficient associated with the long run relationship reported in Table 6.1.4. It is observed that except dividend yield (DY) all the variables are statistically significant. This implies that in the short run all the variables affect stock market volatility. We used Wald test to know the joint effect of those variables, which have lags. It is also observed that all the lag variables are jointly significant impact on stock market volatility in the short run.

The estimated equilibrium correction coefficient is negative and statistically significant. This again confirms the existence of long run relationship among the variables of the model. The value of error correction coefficient indicates that the deviation from the long run equilibrium of the previous period's shock is corrected by 17 per cent in the next period. This implies that approximately 17 per cent of disequilibrium from the previous month's shock converges to the long run equilibrium in the current month.

Table 6.1.4: Estimated Short Run Coefficients using the ARDL Approach:

Dependent Variable: D(LN_CV)						
Selected Model: ARDL(4, 1, 4, 1, 1, 2, 4)						
Sample: 2005M01 2014M12						
Included observations: 114						
Co-integrating Form						
Variable	Coefficient	Std. Error	t-Statistic	P-Value	F-Statistic	P-Value
C	1.626	0.285	5.708	0.000	0.354	0.554
D(LN_CV(-1))	-0.125	0.080	-1.566	0.121	74.935	0.000
D(LN_CV(-2))	-0.090	0.078	-1.154	0.252		
D(LN_CV(-3))	-0.171	0.081	-2.116	0.037		
D(LN_ER)	2.738	0.690	3.969	0.000	8.050	0.001
D(LN_WPI)	3.618	2.186	1.655	0.102	8.654	0.000
D(LN_WPI(-1))	-1.395	2.262	-0.617	0.539		
D(LN_WPI(-2))	4.983	2.124	2.346	0.021		
D(LN_WPI(-3))	-4.257	1.519	-2.802	0.006		
D(LN_IIP)	-0.254	0.249	-1.021	0.310	2.567	0.083
D(NET_FII)	0.000	0.000	1.021	0.310	2.774	0.068
D(P_E)	0.042	0.020	2.067	0.042	2.198	0.094
D(P_E(-1))	0.048	0.020	2.373	0.020		
D(P_B)	-0.007	0.112	-0.058	0.954	2.152	0.067
D(P_B(-1))	-0.279	0.097	-2.860	0.005		
D(P_B(-2))	-0.021	0.043	-0.489	0.626		
D(P_B(-3))	0.084	0.029	2.936	0.004		
D(LN_CMR)	0.135	0.050	2.719	0.008	10.549	0.002
D(LN_TV)	0.119	0.038	3.149	0.002	27.082	0.000
D(DY)	0.243	0.230	1.053	0.295	0.354	0.554
D(TB)	0.000	0.000	-2.289	0.025	4.045	0.047
ECT(-1)	-0.179	0.031	-5.780	0.000		
R-squared	0.978					
Adjusted R-squared	0.971					
F-statistic	142.141					
Prob(F-statistic)	0					
Durbin-Watson stat	2.116					

Source: Estimated by Author, data collected from Handbook of Indian Statistics www.rbi.org.in

The regression for the underlying ARDL equation (7) fits very well as R^2= 0.98 and adjusted R^2= 0.97 with highly significant F=142.14 value.

6.1.3 ARDL Model Diagnostic Tests:

Table 6.1.5: ARDL Model Diagnostic Tests

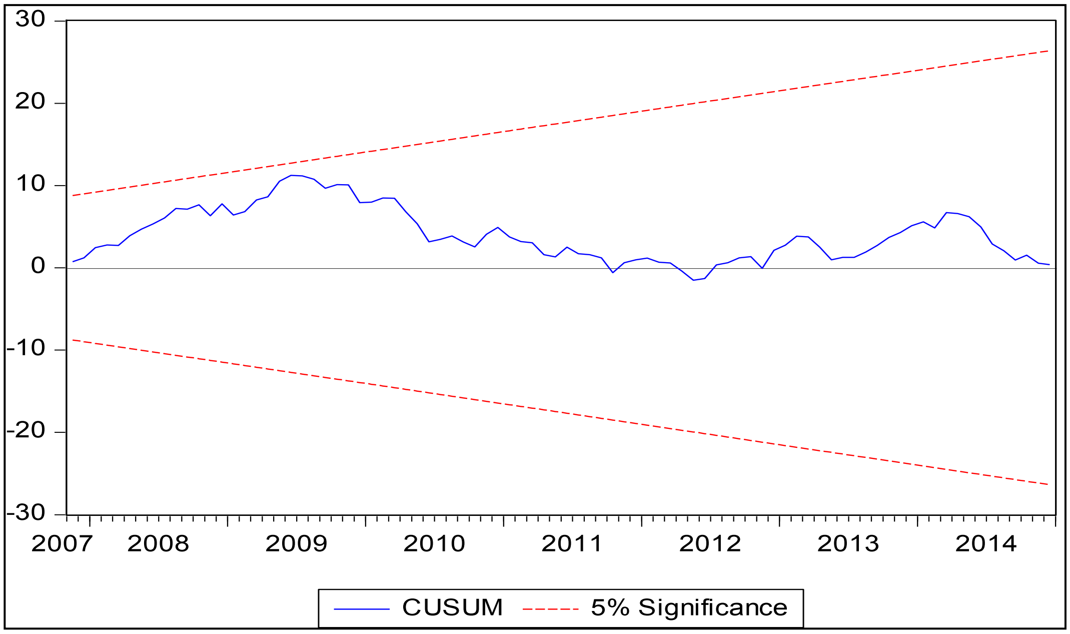
Diagnostic Tests				
Tests	F-statistic	P-Value	Chi Square	P-Value
Breusch-Godfrey Serial Correlation LM Test:	0.74	0.48	1.99	0.37
Heteroscedasticity Test: Breusch-Pagan-Godfrey	1.35	0.15	1.35	0.15
Ramsey RESET Test			0.09	0.76

Source: Estimated by Author, data collected from Handbook of Indian Statistics

The diagnostic tests are reported in Table 6.1.5. From the above table it is observed that there is no evidence of diagnostic problem with the model. The Breush Godfrey serial correlation LM test result shows that the calculated chi-square value is less than the critical value. This indicates that the null hypothesis of no serial correlation is not rejected. This implies that the residuals are not serially correlated. The Breush Pagan Godfrey test of heteroscedasticity suggests that the error variance in the equation is homoscedastic. The Ramsey RESET test result reveals that the calculated chi-square value is less than the critical value. This is an indication that there is no specification error.

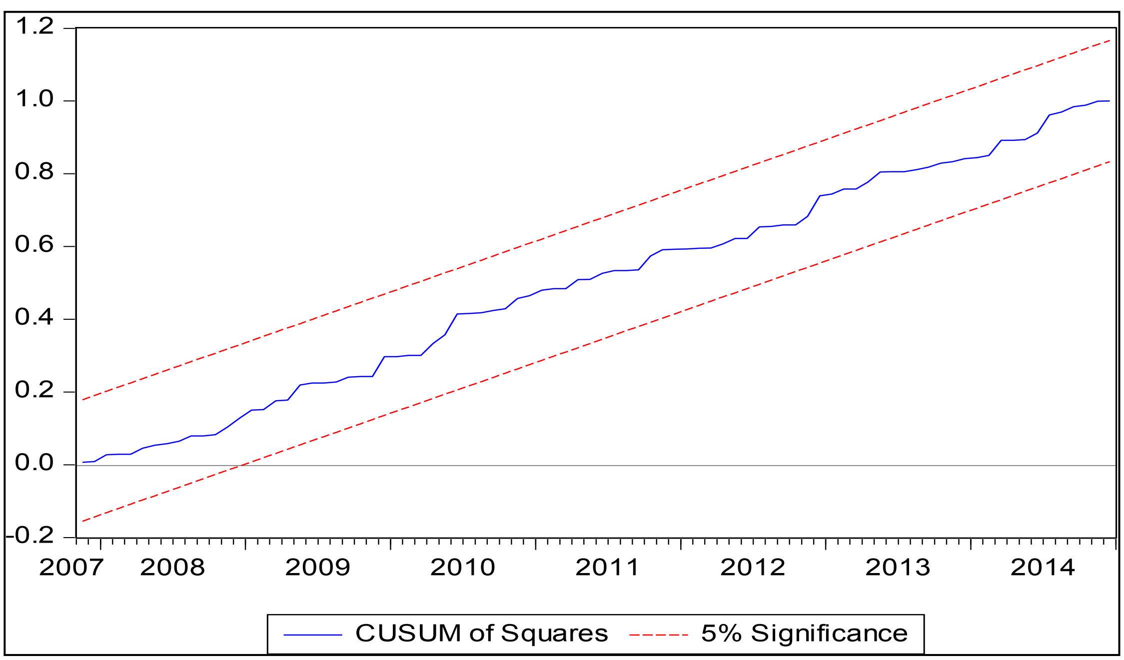
The CUSUM test is based on the cumulative sum of recursive residuals based on the first set of t th observations. It is updated recursively and is plotted against the break points. If the plot of CUSUM statistic stays within five per cent significance level then estimated coefficients are said to be stable. Similar procedure is used to carry out the CUSUMSQ test that is based on the squared recursive residual. A graphical representation of these two tests is given below.

Figure 6.1 CUSUM Test



Since the plot of CUSUM and CUSUMSQ statistic is not cross the critical value lines. Thus, it can be concluded that the estimated coefficients are stable.

Figure 6.2 CUSUMQ Test



6.2 Relationship between Stock Market Volatility and Profitability

The study here investigates the relationship between stock market volatility and industrial profitability of different industries or sectors. Profitability is the ability of a business to earn profit. A profit is what is left of the revenue a business generates after it pays all expenses directly related to the generation of the revenue. Profitability of a company or business can be measured by using profitability ratios. Profitability ratios are a class of financial metrics that are used to assess a company's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time. Investor and creditors can use profitability ratios to judge a company's return on investment based on its relative level resources and assets. To measure profitability of a firm there are several profitability ratios such as profit margin ratio, gross margin ratio, return on assets, return on capital employed etc. The study here uses profit margin ratio to measure the profitability of a company which is mostly used in empirical studies. The profit margin ratio, also called the return on sales ratio or gross profit ratio, is a profitability ratio that measure the net profit earned with each rupees sales generated by comparing the net profit and net sales of a company. The profit margin ratio can be calculated by dividing net profit by net sales.

To examine the relationship between volatility and industrial profitability the following panel regression model is used

$$h_{it} = \omega_{1i} + \gamma \pi_{it} + \varepsilon_{it} \qquad (8)$$

Where i stands for i th cross sectional unit, i = 1, 2, ...,N

t stands for t th time period t = 1, 2, ...,T

π_{it} is the profits of the industries or sectors.

$\omega_{1i} = \omega_1 + u_i$ i = 1, 2... N

The study here analyses the relationship between stock market volatility and profitability of six sectors viz; automobile, banking, energy, financial, FMCG and IT sector separately in the following sub-sections.

6.2.1 Volatility and Profitability of Automobile Industry

From Table 6.2.1, it is observed that the coefficient of profitability of automobile industry is negative and statistically significant at less than five per cent level. This indicates that there is negative relationship between conditional volatility and profitability of automobile industry. This implies that if the profitability of automobile sector declines then volatility of automobile sector increases.

Table 6.2.1: Result Random-effects GLS regression in Automobile Sector

Group variable: PI		Number of observation = 267		
		Number of groups = 9		
R-Square:	Within = 0.0245	Observation per group: min = 11		
	Between = 0.0115	Average = 29.7		
	Overall = 0.0090	Maximum = 37		
Corr.(u_i, Xb) = 0		Wald $chi^2(5)$ = 5.22		
Dependent Variable = CV		Prob. > chi^2 = 0.0223		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(profitability)	-0.00578	0.00253	-2.29	0.022
Constant	0.00544	0.00188	2.89	0.004
Sigma u		0.00153		
Sigma e		0.00361		
Rho		0.15111 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014.

From the estimated result it is observed that if profitability of automobile sector decline by 1 percent then volatility increases by 0.57 percent. This may be due to the fact that if profit earning ability of an industry reduces then rational investor may not be interested to invest in that industry or even they may diversify their wealth to some other industry which has higher earnings ability. This is because a percentage of profit is distributed among the share holders as a dividend. Decline in profitability is negative information in the market for any industry. Negative information makes market more volatile. The intercept term is positive and statistically significant at less than one per cent level of significance. This indicates that certain percentage (0.54) of volatility exist in the automobile sector even if the profitability of automobile industry is zero.

6.2.2 Volatility and Profitability of Banking Sector

Table 6.2.2: Result of Random-effects GLS regression in Banking Sector

Group variable: PI		Number of observation = 467		
		Number of groups = 13		
R-Square:	Within = 0.0021	Observation per group: min = 27		
	Between = 0.1805	Average = 35.9		
	Overall = 0.0094	Maximum = 37		
Corr (u_i, X) = 0 (assumed)		Wald $chi^2(5)$ = 0.14		
Dependent Variable = CV		Prob. > chi^2 = 0.7083		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(profitability)	-0.000436	0.00117	-0.37	0.70
Constant	0.00129	0.00094	1.37	0.17
Sigma u		0 .00045		
Sigma e		0.00108		
Rho		0.14563 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014.

From Table 6.2.2, it is observed that the coefficient of profitability of banking sector is negative but statistically insignificant. This indicates that there is negative relationship between conditional volatility and profitability of banking sector but this relationship is statistically insignificant. This implies that in the banking sector profitability has no statistically significant effect on volatility. That means volatility of banking sector does not depend on profitability. The intercept term is positive but it is also statistically insignificant. This indicates that there is no statistically significant volatility in the Banking sector.

6.2.3 Volatility and Profitability of Energy Sector

Table 6.2.3: Result of Random Effect Model in Energy Sector

Group variable: PI		Number of observation = 357		
		Number of groups = 14		
R-Square	Within = 0.0015	Observation per group: min = 16		
	Between = 0.3326	Average = 25.5		
	Overall = 0.0487	Maximum = 37		
corr(u_i, X) = 0 (assumed)		Wald chi2(5) = 1.78		
Dependent Variable = CV		Prob > chi2 = 0.1822		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(Profitability)	-0.00069	0.00052	-1.33	0.182
Constant	0.00146	0.00045	3.25	0.001
Sigma u		0.00042		
Sigma e		0.00079		
Rho		0.22544 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014

From Table 6.2.3, it is observed that the coefficient of profitability of energy sector is negative but statistically insignificant. This indicates that in the energy sector profitability has no statistically significant effect on volatility. That means volatility of energy sector does not depend on profitability. However, the intercept term is positive and statistically significant at less than one percent level of significance. This indicates that certain percentage (0.14) of volatility exist in the energy sector even if the profit of energy sector is zero.

6.2.4 Volatility and Profitability of Financial Sector

From Table 6.2.4, it is observed that the coefficient of profitability of financial sector is negative and statistically significant at five per cent level of significance. This indicates that there is negative relationship between conditional volatility and profitability of financial sector. This implies that if the profitability of financial sector declines then volatility of financial sector increases.

Table 6.2.4: Result of Random Effect Model in Financial Sector

Group variable: PI		Number of observation = 362		
		Number of groups = 13		
R-Square	Within = 0.0102	Observation per group: min = 11		
	Between = 0.0062	Average = 27.8		
	Overall = 0.0104	Maximum = 37		
corr(u_i, X) = 0 (assumed)		Wald chi2(5) = 3.67		
Dependent Variable = CV		Prob > chi2 = 0.05		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(Profitability)	-0.00128	0.00067	-1.92	0.05
Constant	0.00206	0.00055	3.71	0.00
Sigma u		0.000533		
Sigma e		0.000797		
Rho		.30868 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014

From the estimated result it is seen that if profit of financial sector decline by one per cent then volatility increase by 0.12 percent. This may be due to the fact that if profit of an industry reduces then rational investor may not be interested to invest in that industry or even they may diversify their wealth to some other industry which earns higher profit. This is because a percentage of profit is distributed among the share holders as a dividend. Fall in profit is treated as negative news, which leads to increase in volatility. The intercept term is positive and statistically significant at less than one per cent level of significance. This indicates that certain percentage (0.21) of volatility exist in the financial sector even if the profitability of financial sector is zero.

6.2.5 Volatility and Profitability of FMCG Sector

Table 6.2.5: Result of Random Effect Model in FMCG Sector

Group variable: PI		Number of observation = 182		
		Number of groups = 7		
R-Square	Within = 0.0004	Observation per group: min = 13		
	Between = 0.1991	Average = 26.0		
	Overall = 0.0122	Maximum = 37		
corr(u_i, X) = 0 (assumed)		Wald chi2(5) = 0.01		
Dependent Variable = CV		Prob > chi2 = 0.9146		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(Profitability)	-0.00024	0.00226	-0.11	0.915
Constant	0.00125	0.00173	0.72	0.471
Sigma u		0.00083		
Sigma e		0.00191		
Rho		.15848 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014

From Table 6.2.5, it is observed that the coefficient of profitability of financial sector is negative but statistically insignificant. This indicates that in the FMCG sector profitability has no statistically significant effect on volatility. That means volatility of FMCG sector does not depend on profitability. The intercept term is positive but it is also statistically insignificant. This indicates that there is no statistically significant volatility in the FMCG sector.

6.2.6 Volatility and Profitability of IT Sector

From Table 6.2.6, it is observed that the coefficient of profitability of IT sector is negative and statistically significant at less than one per cent level of significance. This indicates that there is negative relationship between conditional volatility and profitability of IT sector. This implies that if the profitability of IT sector declines then volatility of IT sector increases.

Table 6.2.6 Result of Random Effect Model in IT Sector

Group variable: PI		Number of observation = 397		
		Number of groups = 14		
R-Square:	Within = 0.0081	Observation per group: min = 11		
	Between = 0.3180	Average = 28.4		
	Overall = 0.0352	Maximum = 37		
Corr.(u_i, Xb) = 0		F-statistic = 8.19		
Dependent Variable = CV		Prob. > chi^2 = 0.004		
Variable	Coefficients	Std. Error	t-statistic	P-Value
ln(profitability)	-0.00572	0.00199	-2.86	0.004
Constant	0.00584	0.00159	3.67	0.000
Sigma u		0.00044		
Sigma e		0.00203		
Rho		0.04582 (fraction of variance due to u_i)		

Source: Estimated based on secondary data collected from www.nseindia.com, 2014

From the estimated result it is seen that if profit of IT sector decline by one per cent then volatility increases by 0.57 percent. The intercept term is positive and statistically significant at less than one percent level of significance. This indicates that certain percentage (0.58) of volatility exist in the IT sector even if the profit of IT sector is zero.

6.2.7 Comparative Analysis of Different Sectors

Table 6.2.7 shows the relationship between volatility and profitability of different sectors. From table 6.2.7, it is observed that the coefficient of profitability is negative and statistically significant for automobile, financial and IT sectors. However, the coefficient of profitability is statistically insignificant for banking, energy and FMCG sectors. The impact of profitability on volatility is relatively higher in the automobile sector as compared to other sectors. The impact of profitability on volatility is almost same for automobile and IT sector.

Table 6.2.7: Comparative Analysis of Volatility on Profitability among Different Sectors

Sectors / Variables	Automobile Sector	Banking Sector	Energy Sector	Financial Sector	FMCG Sector	IT Sector
ln(Profitability)	-0.00578**	-0.00043	-0.00069	-0.00128**	-0.00024	-0.00572*
Constant	0.00544*	0.0012	0.0014*	0.0020*	0.0012	0.00584*
Wald chi^2	5.22 (0.02)	0.14 (0.70)	1.78 (0.18)	3.67 (0.05)	0.01 (0.91)	8.19 (0.00)
Sigma u	0.0015	0.0004	0.00042	0.00053	0.0008	0.0004
Sigma e	0.0036	0.0010	0.00079	0.00079	0.0019	0.0020
Rho	0.151	0.145	0.225	0.308	0.158	0.045
Observations	267	467	357	362	182	397
Groups	9	13	14	13	7	14
Corr. (ui, xb)	0	0	0	0	0	0
Model	REM	REM	REM	REM	REM	REM

Source: Estimated based on secondary data collected from www.nseindia.com, 2014

From Table 6.2.7, it is observed that the existence of volatility is relatively higher in IT sector followed by automobile sector and it is relatively lower for energy sector. However, banking and FMCG sector have no statistically significant existence of volatility in the market.