

**Department Of Economics** 

M. Gandhi School of Economics and Commerce

ASSAM UNIVERSITY, SILCHAR

(A Central University constituted under Act XIII of 1989)

Silchar-788011, Assam, India

**DECLARATION** 

I, Md. Intaz Ali bearing Registration No. Ph.D/2009/12, dated: 27.09.2012, hereby

declare that the subject matter of the thesis entitled "Stock Market Volatility and

Returns: A Study of Selected Indian Industries" is the record of work done by me and

that the contents of this thesis did not form the basis for award of any degree to me or to

anybody else to the best of my knowledge. The thesis has not been submitted in any other

University/ Institute.

Date:

**Candidate's Signature** 

Place: Silchar

## **PREFACE**

Industrial development plays a crucial role in economic development. Industrial development depends on capital formation. Stock market acts as an engine of industrial development. Stock market is always considered a place full of uncertainty and volatility. Volatility analysis is important to investigate the behaviour of stock market because issues of volatility and risk have become increasingly important in recent times to financial practitioners, market participants, regulators and researchers. Indian stock market being an important part of emerging Indian economy attracts foreign capital which enhances the fluctuations more. It is very important to understand the behaviour of the stock market so that an investor can be careful at the time of investment.

The present research is done to measure the stock market volatility and its pattern. It also shows the relationship between stock market volatility and expected return. Further, it also depicts the relationship between stock market volatility and industrial profitability and also reveals the relationship between stock market volatility and firm size. Finally, the study attempts to identify the responsible determinant of stock market volatility.

It is a pleasure and great opportunity to express my profound sense of gratitude to all those who helped me in the completion of my thesis. Successful completion of any thesis depends upon expert guidance, able supervision, willing co-operation, active support, valuable suggestions, and personal involvement of the concerned people. This thesis is the outcome of accumulated effort of such guidance, supervision, co-operation, support and involvement of many.

First of all, while acknowledging concerned people, I would like to express my special appreciation and thanks to my supervisor Dr. Subhrabaran Das, Associate Professor, Department of Economics, Tripura University, Tripura (Former Assistant Professor, Department of Economics, Assam University) for his commendable guidance, constant attention and splendid supervision. I also take it as privilege to place on my profound sense of indebtedness to my co-supervisor Prof. Niranjan Roy, Professor, Department of Economics, Assam University, Silchar for his encouragement, stimulating guidance and suggestions without which the work would not have been possible.

I would also like to extend a special thanks to Prof. B. Kamaiah, School of Economics, University of Hyderabad and Nityananda Sarkar, ISI, Kolkata for their comments and suggestions during after session conversation in the Workshop of Time Series Econometrics held in IIT, Guwahati, which have resulted in significant improvement in the quality of the research. This work has also benefitted from the precious suggestions of Prof. M. P. Bezbarua, Department of Economics, Gauhati University.

I would also like to thank all the faculty members of the Department of Economics, Assam University, Silchar especially Dr. Avijit Debnath for their comments and valuable suggestions for the improvement of the thesis.

I would like to express my heartiest gratitude and indebtedness to my family members specially my parents and my friends, specially Monalisa, Promila and Dipon and most importantly to Mrs. Susmita Das Bera, wife of my supervisor, Dr. Subhrabaran Das and to others who have helped me through inspiration and emotional support during the entire course of my Ph.D. programme.

I would also like to express my appreciation to my beloved wife Alfina Khatun

Talukdar for her active support, constant co-operation, personal involvement,

constructive suggestions and special care.

Last but not the least I would like to express my sense of obligations to all those

who have directly and indirectly given their fruitful assistance in connection with

this thesis.

Place: Silchar

Dated:

Md. Intaz Ali

## **CONTENTS**

Sl.	CHAPTERS	Page No.
No		
1.	Chapter 1	
	Introduction	1-10
	1.1 Background of the Study	1-5
	1.2 Statement of the Problems & Relevance of the Study	5-7
	1.3 Objectives of the Study	7
	1.4 Hypotheses of the Study	8
	1.5 Data and Data Sources	8-10
	1.6 Outline of the Chapters	10
2.	Chapter 2	
	Review Of Literature	11-40
3.	Chapter 3	
	Theoretical and Conceptual Framework and Methodology	41-82
	3.1 Theoretical and Conceptual Framework	41-71
	3.2 Methodology of the Study	71-82
4.	Chapter 4	
	Relationship between Stock Market Volatility and Return	83-161
	4.1 Measurement of Volatility and its Pattern	84-152
	4.1.1 Volatility and its Pattern in Automobile Sector	88-99
	4.1.2 Volatility and its Pattern in Banking Sector	99-109
	4.1.3 Volatility and its Pattern in Energy Sector	109-120

	4.1.4 Volatility and its Pattern in Financial Sector	120-131
	4.1.5 Volatility and its Pattern in FMCG Sector	131-142
	4.1.6 Volatility and its Pattern in IT Sector	142-152
	4.2 Comparative Analysis among the Sectoral Indices	152-161
	4.2.1 Descriptive Statistics of Sectoral Indices	153-154
	4.2.2 Result of GARCH-M Model:	154-156
	4.2.3 Result of EGARCH Model	157-159
	4.2.4 Sector wise and Company wise Analysis of Risk	159-161
5.	Chapter-5	
	Impact of Stock Market Volatility and Firm's Size on Return	162-177
	5.1 Sector wise Analysis of Expected return and Firm Size	163-175
	5.1.1 Identification of Appropriate Model	164-165
	5.1.2 Sector wise Analysis of Expected Return and Firm Size	165-175
	5.2 Sector wise Comparative Analysis	175-177
6.	Chapter-6	
	Volatility and Industrial Profitability	178-195
	6.1 Stock Market Volatility and Its Responsible Factors	179-187
	6.1.1 Unit Root Test	180-181
	6.1.2 Bound Test for Co-integration Analysis	181-185
	6.1.3 ARDL Model Diagnostic Tests	186-187
	6.2 Relationship between Stock Market Volatility and Profitability	187-195
	6.2.1 Volatility and Profitability of Automobile Industry	189-190
	6.2.2 Volatility and Profitability of Banking Sector	190-191

9.	Appendix	226-232
8.	Bibliography	205-225
	7.4 Limitations of the Study and Scope for further Research	204
	7.3 Suggestive Policy Measures	202-203
	7.2 Conclusion	199-202
	7.1 Summary of the Study	196-199
	Summary, Conclusion and Suggestions	196-204
7.	Chapter 7	
	6.2.7 Comparative Analysis of Different Sectors	195
	6.2.6 Volatility and Profitability of IT Sector	194
	6.2.5 Volatility and Profitability of FMCG Sector	193
	6.2.4 Volatility and Profitability of Financial Sector	192-193
	6.2.3 Volatility and Profitability of Energy Sector	191

## LIST OF TABLES AND FIGURES

SL	LIST OF TABLES	Page
No.		No.
1.	Table 4.1.1: Descriptive Statistics of Return Series of Automobile	88
	Industry	
2.	Table 4.1.2: Unit Root Test for Return Series in Automobile Industry	90
3.	Table 4.1.3: ARCH-LM Test for Automobile Sector	91
4.	Table 4.1.4: Result of GARCH-M Model for Automobile Sector	94
5.	Table 4.1.5: ARCH-LM Test for Automobile Industry after	95
	Estimation	
6.	Table 4.1.6: Result of E-GARCH Model for Automobile Industry	98
7.	Table 4.1.7: Descriptive Statistics of Return Series of Banking Sector	99
8.	Table 4.1.8: Unit Root Test for Return Series of Banking Sector	101
9.	Table 4.1.9: ARCH-LM Test for Banking Sector	102
10.	. Table 4.1.10: Result of GARCH-M Model for Banking Sector	104
11.	. Table 4.1.11: ARCH LM TEST for Banking Sector	107
12.	Table 4.1.12: Result of EGARCH Model for Banking Sector	108
13.	Table 4.1.13: Descriptive Statistics for Return Series in Energy	110
	Sector	
14.	Table 4.1.14: Unit Root Test for Return Series in Energy Sector	112
15.	Table 4.1.15: ARCH LM Test for Energy Sector	113
16.	Table 4.1.16: Result of GARCH-M Model for Energy Sector	115
17	Table 4.1.17: ARCH LM Test for Energy Sector	118

18. Table 4.1.18: Result of EGARCH Model for Energy Sector	119
19. Table 4.1.19: Descriptive Statistics of Return Series in Fina	ncial 121
Sector	
20. Table 4.1.20: Unit Root Test for Return Series in Financial	Sector 123
21. Table 4.1.21: ARCH-LM Test for Financial Sector	124
22. Table 4.1.22: Result of GARCH-M Model for Financial Sec	etor: 126
23. Table 4.1.23: ARCH -LM Test for Financial Sector	128
24. Table 4.1.24: Result of EGARCH Model for Financial Sector	or 130
25. Table 4.1.25: Descriptive Statistic of Return Series in FMC	G Sector 132
26. Table 4.1.26: Unit Root Test for FMCG Sector	133
27. Table 4.1.27: ARCH LM TEST for FMCG Sector	134
28. Table 4.1.28: Result of GARCH Model for FMCG Sector	138
29. Table 4.1.29: ARCH LM Test for FMCG Sector	139
30. Table 4.1.30: Result of EGARCH Model for FMCG Sector	141
31. Table 4.1.31: Descriptive Statistics of Return Series in IT Series	ector 142
32. Table 4.1.32: Unit Root Test for IT Sector	144
33. Table 4.1.33: ARCH LM Test for IT Sector	145
34. Table 4.1.34: Result of GARCH-M Model for IT Sector	147
35. Table 4.1.35: ARCH LM TEST for IT Sector	150
36. Table 4.1.36: Result of EGARCH Model for IT Sector	151
37. Table 4.2.1 Descriptive Statistics of Return Series for Secto	oral 153
Indices	
38. Table 4.2.2: Result of GARCH-M Model of Sectoral Indice	es 155

39.	Table 4.2.3: Result of EGARCH Model of Sectoral Indices	158
40.	Table 4.2.4: Sector wise and Company wise Analysis of Risk	160
41.	Table 5.1.1: Result of Hausman Test for Different Sectors	165
42.	Table 5.1.2: Random-Effects GLS Regression for Automobile Sector	166
43.	Table 5.1.3: Random-Effects GLS Regression for Banking Sector	168
44.	Table 5.1.4: Random-Effects GLS Regression for Energy Sector	169
45.	Table 5.1.5: Random-Effects GLS Regression for Financial Sector	171
46.	Table 5.1.6: Random-Effects GLS Regression for FMCG Sector	172
47.	Table 5.1.7: Random-Effects GLS Regression for IT Sector	174
48.	Table 5.1.8: Relationship between Expected Return and Firm Size in	175
	Different Sectors	
49.	Table 6.1.1: Augmented Dickey Fuller Unit Root Test	181
50.	Table 6.1.2: ARDL Bounds Test (with intercept but no trend) for Co-	182
	integration Analysis	
51.	Table 6.1.3: Estimated Long Run Coefficients using the ARDL	183
	Approach	
52.	Table 6.1.4: Estimated Short Run Coefficients using the ARDL	185
	Approach	
53.	Table 6.1.5: ARDL Model Diagnostic Tests	186
54.	Table 6.2.1: Result Random-effects GLS regression in Automobile	189
	Sector	
55.	Table 6.2.2: Result of Random-effects GLS regression in Banking	190
	Sector	

56. Table 6.2.3: Result of Random Effect Model in Energy Sector	191
57. Table 6.2.4: Result of Random Effect Model in Financial Sector	192
58. Table 6.2.5: Result of Random Effect Model in FMCG Sector	193
59. Table 6.2.6: Result of Random Effect Model in IT Sector	194
60. Table 6.2.7:Comparative Analysis of Volatility on Profitability	195
among Different Sectors	
61. Table 1.1 A: Sectoral Rankings based on Traded Value, Percentage of	226
Market Representation and Percentage of Sectoral Representation	
62. Table 1.2A: Sector wise Selected Companies based on Market	226-229
Capitalization	
63. Table 1.3 A: Sector wise Firm size	229-231

Sl.	LIST OF FIGURES	Page	
No.		No.	
1.	Figure 6.1 CUSUM Test	187	
2.	Figure 6.2 CUSUMQ Test	187	

## **ABBREVIATIONS**

AA Atul Auto Limited.

ABL Axis Bank Limited.

ADF Augmented Dicker Fuller.

AL Ashok Leyland Limited.

APL Adani Power Limited.

AR Auto Regressive.

ARCH Auto Regressive Conditional Heteroscedasticity.

ARDL Auto Regressive Distributed Lag.

ARMA Auto Regressive Moving Average.

ASX Australian Stock Exchange.

BA Bajaj Auto Limited.

BCL Bajaj Corporation Limited.

BFL Bajaj Finance Limited.

BFSL Bajaj Finanserv Limited.

BFU BF Utilities Limited.

BHI Bajaj Holdings & Investment Limited.

BI Britannia Industry.

BOB Bank Of Baroda.

BOI Bank Of India.

BSE Bombay Stock Exchange.

BV Book Value.

CAPM Capital Asset Pricing Model.

CBL Canara Bank Limited.

CESC Calcutta Electric Supply Corporation.

CIFC Cholamandalam Investment And Finance Company Limited.

CMR Call Money Rate.

CPI Colgate Palmolive (India) Limited.

CRR Cash Reserve Ratio.

CUSUM Cumulative Sum.

CUSUMQ Cumulative Sum of Square.

CV Conditional Variance.

DIL Dabur India Limited.

DPS Dividend Per Share.

DY Dividend Yield.

ECSL Eclerx Services Limited.

EGARCH Exponential Generalized Autoregressive Conditional Heteroscedasticity.

EL Escorts Limited.

EM Eicher Motors Limited.

EMH Efficient Market Hypothesis.

EPS Earning Per Share.

ER Exchange Rate.

F&O Future and Options.

FDI Foreign Direct Investment.

FII Foreign Institutional Investors.

FMCG Fast Moving Consumer Goods.

FOREX Foreign Exchange.

GARCH Generalized Autoregressive Conditional Heteroscedasticity.

GARCH-M Generalized Autoregressive Conditional Heteroscedasticity in Mean.

GCP Godrej Consumer Products Limited.

GDP Gross Domestic Product.

GED Generalized Error Distribution.

GFL Gruh Finance Limited.

GIL Gillette India Limited.

GJR Glosten, Jagannathan and Runkle.

GLS Generalised Least Square.

GMM Generalised Method of Moment.

GSCH Glaxosmithkline Consumer Healthcare Limited.

HCL Hindustan Computers Limited.

HDFC Housing Development Finance Corporation.

HM Hero Motocorp Limited.

HMT Hindustan Machine Tools.

HNM Hindustan Motors Limited.

HTL Hexaware Technologies Limited.

HUL Hindustan Unilever Limited.

ICICI Industrial Credit and Investment Corporation of India.

IDBI Industrial Development Bank of India.

IDFC Industrial Development Finance Corporation.

IEL Infotech Enterprises Limited.

IFCI Industrial Financial Corporation of India.

IGARCH Integrated Exponential Generalized Autoregressive Conditional

Heteroscedasticity.

IIP Index of Industrial Production.

IL Infosys Limited.

ILB Indusind Bank Limited.

INGV ING VYSYA Bank Limited.

IPO Initial Public Offering.

IT Information Technology.

J&K The Jammu & Kashmir Bank Limited.

JLL Jyothy Laboratories Limited.

JPV Jaiprakash Power Ventures Limited.

KMB Kotak Mahindra Bank Limited.

KPIT Kirtane Pandit Information Technology.

KRBL KRBL Limited.

KSK Energy Ventures Limited.

LICH Life Insurance Corporation Housing.

LM Lagrange Multiplier.

LTH Larsen & Toubro Holdings.

MFL Muthoot Finance Limited

ML Marico Limited.

MM Mahindra & Mahindra Limited.

MMF Mahindra & Mahindra Financial.

MP Market Price.

MPL Mphasis Limited.

MS Maharashtra Scooters Limited.

MSI Maruti Suzuki India Limited.

MTL Mindtree Limited.

NASDAQ National Association of Securities Dealers Automated Quotations.

NHPC National Hydroelectric Power Corporation.

Nifty NSE Fifty.

NIIT Technologies Limited.

NIL Nestle India Limited.

NLC Neyveli Lignite Corporation Limited.

NSE National Stock Exchange.

NTPC National Thermal Power Corporation Limited.

NYSE New York Stock Exchange.

OFSL Oracle Financial Service Limited.

OLS Ordinary Least Square.

P/E Price-Earning Ratio.

PB Price to Book Value.

PGC Power Grid Corporation of India Limited

PGHC Procter & Gamble Hygiene Corporation.

PNB Punjab National Bank.

PP Phillips-Perron Test.

PSL Persistent System Limited.

RBI Reserve Bank of India.

RCL Reliance Capital Limited.

REM Random Effect Model.

RIL Reliance Infrastructure Limited.

RPL Reliance Power Limited.

S&P CNX Standard & Poor CRISIL NSE Index Nifty.

SBI State Bank Of India.

SCU Shri. City Union.

SEBI Securities and Exchange Board of India.

SENSEX Sensitive Index.

SFL Sundaram Finance Limited.

SI SML Isuzu Limited.

SJVN Satluj Jal Vidyut Nigam Limited.

SRT Sriram Transport.

TB Trade Balance.

TCS Tata Consultancy Service Limited.

TGARCH Threshold Generalized Autoregressive Conditional Heteroscedasticity.

TM Tata Motors Limited.

TML Tech Mahindra Limited.

TPC Tata Power Company Limited.

TPL Torrent Power Limited.

TV Trading Volume.

TVS Motor Company Limited.

VL Vakrangee Limited.

VST V.S.T Tillers Tractors.

WL Wipro Limited.

WPI Wholesale Price Index.

YSB Yes Bank Limited.

ZWL Zydus Wellness Limited.