

TESTING OF OVERCONFIDENCE BIAS AND DISPOSITION EFFECT IN INDIAN STOCK MARKET

Thesis

Submitted to the University of Calicut

For the Award of the Degree of

DOCTOR OF PHILOSOPHY IN COMMERCE

SAFEEDA K A

Under the Supervision of

Dr. Ganesh R

Assistant Professor



PG & Research Department of Commerce and Management Studies

St. Mary's College, Sulthan Bathery, Kerala-673592

(Affiliated to the University of Calicut)

March 2026

DECLARATION

I hereby declare that the thesis entitled "**Testing of Overconfidence Bias and Disposition Effect in Indian Stock Market**" is based on the original work done by me under the guidance and supervision of **Dr. Ganesh R**, Assistant Professor, PG & Research Department of Commerce and Management Studies, St. Mary's College, Sulthan Bathery, and no part of the thesis has been presented for the award of any degree, diploma, associateship, fellowship, or other similar titles of recognition. The contents of the thesis have undergone a plagiarism check using the iThenticate software at the C.H.M.K. Library, University of Calicut, and the similarity index was found to be within the permissible limit. I also declare that the thesis is free from AI-generated content.



Safeeda K A
(Research Scholar)



Dr. Ganesh R
(Supervising Teacher)

Place: Sulthan Bathery

Date: 18.03.2026

Dr. GANESH R.
Assistant Professor & Research Guide
P.G. and Research Dept. of Commerce
St. Mary's College, Sulthan Bathery



ST. MARY'S COLLEGE

SULTHAN BATHERY, WAYANAD
KERALA, 673592

A Postgraduate Aided Arts & Science College of Malankara Orthodox Syrian Church Affiliated to the University of Calicut

NAAC ACCREDITED WITH A+ GRADE

CERTIFICATE

This is to certify that the thesis entitled "**Testing of Overconfidence Bias and Disposition Effect in Indian Stock Market**" submitted to the University of Calicut in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy in Commerce, is a record of original work done by **Ms. Safeeda K A**, under my supervision and guidance and the thesis has not formed the basis for awarding any degree, diploma, associateship, fellowship, or other similar titles of recognition to any candidate in any institute or university.

Neither of the examiners has recommended any modifications or suggestions, and therefore, the original thesis is submitted as such. The soft copy attached is the same as that of the hard copy submitted.

Place: Sulthan Bathery

Date: 9.07.2026.

Dr. Ganesh R
(Research Supervisor)

Dr. GANESH R.
Assistant Professor & Research Guide
P.G. and Research Dept.of Commerce
St. Mary's College, Sulthan Bathery



UNIVERSITY OF CALICUT

CERTIFICATE ON PLAGIARISM CHECK

1.	Name of the Research Scholar	SAFEEDA K A	
2.	Title of thesis / dissertation	Testing of Overconfidence Bias and Disposition Effect in the Indian Stock Market	
3.	Name of the Supervisor	Dr. Ganesh R	
4.	Department/Institution	PG and Research Department of Commerce and Management Studies, St.Mary's College, Sulthan Bathery, Wayanad- 673592	
5.	Similar content (%) identified	Non Core	Core
		Introduction/ Theoretical overview/Review of literature/ Materials & Methods/ Methodology	Analysis/Result/Discussion / Summary/Conclusion/ Recommendations
		5	3
	Acceptable maximum limit (%)	10	10
6.	Software used	iThenticate	
7.	Date of verification	06.03.2026	

*Report on plagiarism check, specifying included/excluded items with % of similarity to be attached.

Checked by (with name, designation & signature)

Dr. Nasirudheen. T

Assistant Librarian

University of Calicut, Kerala.

Name and signature of the Researcher Safeeda. k. a

Name and signature of the Supervisor

Dr. GANESH R.

Assistant Professor & Research Guide

P.G. and Research Dept. of Commerce

St. Mary's College, Sulthan Bathery

The Doctoral Committee* has verified the report on plagiarism check with the contents of the thesis, as summarized above and appropriate measures have been taken to ensure originality of the Research accomplished herein.

Name & Signature of the HoD/HoI (Chairperson of the Doctoral Committee)

Principal In-Charge
ST. MARY'S COLLEGE

*In case of languages like Malayalam, Tamil etc. on which no software is available for plagiarism check, a manual check shall be made by the Doctoral Committee, for which an additional certificate has to be attached.



Acknowledgement

First and foremost, I bow my head in gratitude before God Almighty. It is His divine grace that gave me the strength to endure the challenges of this journey and His countless blessings that provided me with the wisdom and perseverance to see this through to completion.

I find myself short of words to express my profound gratitude to my research supervisor, Dr. Ganesh R. His guidance was nothing short of exemplary; he was the steady compass that navigated me through the complexities of this research. Beyond his scholarly expertise, his patience, insightful critiques, and constant encouragement transformed this academic pursuit into a truly enriching experience. I am deeply honoured to have worked under such a wonderful mentor.

I am also immensely grateful to Dr. Shreesha CH, HOD, DCMS, University of Calicut. Her proper guidance, professional motivation, and vision were instrumental in shaping the direction of this work.

My sincere thanks go to the College Research Promotion Council for their unwavering support and guidance throughout this journey. I also extend my gratitude to the Teachers of the Commerce Department and the College Administration for providing the necessary facilities and a conducive environment for my research.

On a personal note, I would like to express my heartfelt gratitude to my family for their constant love and support throughout this journey. I am deeply grateful to my husband, Faisal CA, for always standing by my side. His encouragement, patience, and belief in my dreams gave me the strength to continue even during the most challenging moments. I am also very thankful to my children, Isha and Ishan, whose love, innocence, and patience inspired me every day. Their quiet understanding and the time they sacrificed allowed me to focus on completing this work.

I would like to sincerely thank my father, Mr. Abdul Gafoor, who has always been my first teacher and role model. His lessons about hard work, dedication, and consistency have guided me throughout my life. My heartfelt gratitude also goes to

my mother, Mrs. Sainaba, whose prayers, love, and emotional support have always been a source of comfort and strength for me, even while she was managing her own health.

I also extend my sincere thanks to my extended family for their encouragement and support, which helped me stay motivated during the long and demanding days of research. Finally, I would like to thank my fellow research scholars for their friendship, support, and the many shared moments that made this journey more meaningful and memorable.

Finally, I take a moment to thank myself. I honour the courage I had to embark on this arduous endeavour and the unwavering perseverance and dedication I maintained until the very end.

SAFEEDA K A

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ABSTRACT

Chapter 1

Introduction 1 – 12

1.1	Introduction	1
1.2	Statement of the Problem	4
1.3	Objectives of the Study	4
1.4	Significance of the Study.....	5
1.5	Scope of the Study.....	5
1.6	Period of the Study	6
1.7	Variables Used in the Study	6
1.8	Operational Definitions.....	7
1.9	Hypotheses of the Study.....	10
1.10	Limitations of the Study.....	11
1.11	Layout of the Study	11

Chapter 2

Review of the Literature 13 – 38

2.1	Introduction	13
2.2	Studies Related to Overconfidence Bias (OCB).....	13
2.2.1	The Overconfidence Bias in Global Markets.....	14
2.2.2	OCB in the Indian Stock Market.....	18
2.3	Studies related to Disposition Effect (DE)	20
2.3.1	The Disposition Effect in Global Markets.....	21
2.3.2	DE in the Indian Stock Market	25
2.4	Studies related to differential reaction to information.....	26

2.5	OCB and DE during the COVID-19 pandemic	28
2.6	Research Gap.....	29
	References.....	31

Chapter 3

Theoretical Framework..... 39 – 56

3.1	Introduction	39
3.2	Development of Behavioural Finance	41
3.3	Growth of Behavioural Finance	44
3.4	Behavioural Biases.....	46
	3.4.1 Cognitive Biases.....	46
	3.4.2 Frame Dependent/Emotional Biases	49
3.5	Overconfidence Bias (OCB)	51
3.6	The Disposition Effect (DE).....	52
3.7	White Swan, Grey Swan and Black Swan Phases.....	53
3.8	Market Capitalisation.....	54

Chapter 4

Research Methodology..... 57 – 66

4.1	Introduction	57
4.2	Research design and methodology.....	57
4.3	Source of data	57
4.4	Period of the Study	58
4.5	Sample size determination.....	58
4.6	Sampling Method.....	58
4.7	Tools for data collection.....	59
4.8	Data processing and Analysis	59
4.9	Pre-test for Questionnaire	59
4.10	Reliability and Validity	59
4.11	Market Vector Autoregression (M-VAR)	61
4.12	Security Vector Autoregression	63
4.13	Structural VAR (SVAR).....	65
4.14	ANOVA	66
4.15	Independent sample t-test.....	66

Chapter 5

Overconfidence Bias in the Indian Stock Market (OCB) ... 67 – 86

5.1	Overconfidence Bias in the Indian Stock Market.....	67
5.2	OCB During Different Swan Phases.....	71
5.2.1	Overconfidence Bias During the White Swan Phase	73
5.2.2	Overconfidence bias during The Grey swan phase	75
5.2.3	Overconfidence Bias During Black Swan Phase	77
5.3	Relation Between Volatility, Market Return and Volume.....	79
5.4	Conclusion.....	80
	References.....	83

Chapter 6

Disposition Effect in the Indian Stock Market (DE)87 – 94

6.1	DE in The Indian Stock Market	87
6.2	DE During Different Swan Phases.....	88
6.2.1	DE During White Swan Phase	88
6.2.2	DE During the Grey Swan Phase.....	88
6.2.3	DE During Black Swan Phase.....	89
6.3	Conclusion.....	90
	References.....	93

Chapter 7

OCB & DE In Different Market Caps Across Swan Phases... 95 – 110

7.1	OCB and DE in Large Cap During the White Swan Phase	95
7.2	OCB and DE in large cap during grey swan	96
7.3	OCB and DE in large cap during black swan	98
7.4	OCB and DE in Mid-cap During the White Swan Phase	98
7.5	OCB and DE in Mid-cap During Grey Swan Phase.....	99
7.6	OCB and DE in Mid-cap During Black Swan Phase.....	100
7.7	OCB and DE in Small-cap during White Swan Phase.....	101
7.8	OCB and DE in Small-Cap During Grey Swan Phase.....	101
7.9	OCB and DE in Small-Cap During Black Swan Phase.....	102
7.10	Comparison of OCB and DE Across Market Caps Over Different Swan Phases.....	103

7.11	Conclusion.....	107
	References.....	109

Chapter 8

Differential Reaction to Private and Public Information. 111 – 114

8.1	Differential Reaction to Private and Public Information.....	111
8.2	Conclusion.....	113
	References.....	114

Chapter 9

Investors' Perception Towards OCB and DE..... 115 – 135

9.1	Validity and Reliability Tests.....	115
9.2	Demography of the Respondents.....	115
9.3	The Disposition Effect	119
9.4	Overconfidence Bias.....	125
9.5	Role of Private Information and Public Information in Investment Decisions.....	130
9.6	Comparison of Investors' Perception of OC and DE with Actual Market Behaviour	131
	References.....	133

Chapter 10

Summary, Findings and Conclusion..... 136 – 150

10.1	Summary	136
10.2	Findings.....	142
	10.2.1 OCB in Indian Stock Market	142
	10.2.2 The DE in the Indian Stock Market.....	143
	10.2.3 OCB and DE in The Indian Stock Market During Different Swan Phases in Different Market Capitalisation Stock.....	145
	10.2.4 Differential Reaction to Private and Public Information	146
	10.2.5 Investor Perception Regarding OCB and DE.....	146
10.3	Conclusion.....	148

Chapter 11

Recommendations and Scope for Future Research 151 – 154

11.1	Introduction	151
11.2	Recommendations	151
11.2.1	Recommendations to Investors.....	151
11.2.2	Recommendations for Financial Advisors	152
11.2.2	Recommendations to Regulators and Policy Makers.....	152
11.3	Implications of the study.....	153
11.3.1	Implications to Investors	153
11.3.2	Implications to Financial Advisors and Share Brokers	153
11.3.3	Implications to Society.....	153
11.3.4	Implications to Academicians	154
11.4	Scope for Future Study	154

Bibliography..... i – xviii

Appendices.....i – cclxxiv

LIST OF TABLES

Table	Title	Page No.
3.1	Cognitive Biases	47
3.2	Heuristics-Driven Biases	50
5.1	Descriptive Statistics (2014-22)	67
5.2	Stationarity of Variables (2014-22)	68
5.3	VAR Results (2014 - 2022)	69
5.4	Descriptive Statistics of Variables	72
5.5	Stationarity of Variables During White Swan	73
5.6	VAR Results During White Swan Phase	74
5.7	Stationarity of Variables During Grey Swan Phase	75
5.8	VAR Results During Grey Swan Phase	76
5.9	Stationarity of Variables During Black Swan Phase	78
5.10	VAR Results During Black Swan Phase	78
5.11	Relation Between Volatility, Market Return and Volume	79
5.12	Comparison of OCB Across Different Phases	80
6.1	Comparison of DE in the Indian Stock Market Over Different Phases	90
7.1	Comparison of OCB and DE in Large, Mid, and Small-cap Stocks Over Swan Phases	103
9.1	Demographic Profile of Respondents	117
9.2	Investment Behaviour of Respondents	118
9.3	Descriptive Statistics of DE Statements	120
9.4	One-way ANOVA Test for Investment Experience and DE	121

Table	Title	Page No.
9.5	Games-Howell Post-Hoc Test for Investment Experience and DE	121
9.6	Independent Sample t-Test for DE among Investor Groups	122
9.7	Independent Sample t-Test Results for Investment Satisfaction Among Investor Groups	123
9.8	Gender and DE -ANOVA	124
9.9	Gender and DE -Games-Howell Post-Hoc Test Result	124
9.10	Mean Score of OCB Statements	125
9.11	Independent Sample t-Test for OCB among Investor Groups	126
9.12	ANOVA Results of OCB and Investment Experience	127
9.13	Games-Howell Post-Hoc Test for Investment Experience and OCB	127
9.14	Gender and OCB -ANOVA	129
9.15	Gender and OCB- Tukey Posy-Hoc Test Results	129
9.16	Role of Private and Public Information on Investment Decisions	130

LIST OF FIGURES

Figure	Title	Page No
5.1	IRF of Volume to Return (2014-22)	71
5.2	IRF Volume to Market Return During White Swan Phase	75
5.3	IRF Volume to Market Return During Grey Swan Phase	77
8.1	IRF of Price to Private Information Signals	111
8.2	IRF of Price to Public Information Signals	112

ABBREVIATIONS

DE	-	Disposition Effect
IRF	-	Impulse Response Function
NSE	-	National Stock Exchange
OCB	-	Overconfidence Bias
SEBI	-	Securities and Exchange Board of India
S-VAR	-	Security Vector Autoregression
SVAR	-	Structural VAR
VAR	-	Vector Autoregression

Abstract

This study explored how behavioural biases, specifically overconfidence and the disposition effect, manifest in the Indian stock market across different market environments: comparatively predictable (White Swan), uncertain (Grey Swan), and unpredictable (Black Swan, such as the COVID-19 pandemic). Covering the period from April 2014 to March 2022, the research aimed to quantify these biases across various market phases and stock capitalizations (large, mid, and small-cap), examine investor overreaction to private information, and compare perceived versus actual trading behaviours.

A mixed-methods approach combined secondary market data from the Nifty 500 Index with primary survey data from Indian equity investors. Econometric techniques like VAR and SVAR models were applied to trading volume and stock returns to detect behavioural patterns, while statistical analyses of survey data captured perceived biases. These analyses were segmented by market phase and stock capitalization to provide detailed insights.

The findings showed that overconfidence bias was evident during stable and uncertain phases, but surprisingly absent during the Black Swan period, suggesting investors became more risk-aware during extreme crises. Conversely, the disposition effect (selling winners too soon, holding losers too long) was consistently present across all market phases, intensifying under uncertain conditions and particularly affecting small-cap stocks. Small-cap stocks generally exhibited stronger behavioural intensity and trading sensitivity compared to mid-cap and large-cap stocks, which displayed more restrained reactions. The study also identified that investors tend to overreact to private information signals, and while they acknowledge biases, they often underestimate their true influence on their trading decisions.

In essence, the research highlights that investor biases are not static traits but dynamically adapt to market conditions. These insights offer valuable implications for investors, financial advisors, and regulators, emphasizing the need for behavioural awareness to craft better investment strategies, improve risk communication, and enhance market efficiency across varying market regimes. Future research may extend analysis to post-pandemic market conditions and incorporate institutional investor behaviour to further strengthen behavioural insights.

Keywords: Overconfidence bias, Disposition effect, Information reaction, Black swan, Grey swan, White Swan, Indian stock Market, Investor biases, Covid-19, Market capitalization

സംഗ്രഹം

ഈ പഠനം, ഇന്ത്യൻ ഓഹരി വിപണിയിൽ നിക്ഷേപകരുടെ സ്വഭാവപരമായ പക്ഷപാതങ്ങളായ 'അമിത ആത്മവിശ്വാസവും' (overconfidence bias) 'ഡിസ്പോസിഷൻ ഇഫക്ട്' എങ്ങനെ പ്രകടമാകുന്നു എന്ന് പരിശോധിച്ചു. താരതമ്യേന പ്രവചിക്കാൻ കഴിയുന്ന (White Swan), അനിശ്ചിതത്വമുള്ള (Grey Swan), അതീവ പ്രവചനാതീതമായ (Black Swan - കോവിഡ്-19 മഹാമാരി പോലെ) സാഹചര്യങ്ങളിലാണ് ഇത് പഠനവിഷയമാക്കിയത്. 2014 ഏപ്രിൽ മുതൽ 2022 മാർച്ച് വരെയുള്ള കാലയളവിലെ വിവരങ്ങൾ ഉൾക്കൊണ്ട്, വിവിധ വിപണി ഘട്ടങ്ങളിലും, വലിയ, ഇടത്തരം, ചെറിയ മൂലധനമുള്ള ഓഹരികളിലും ഈ പക്ഷപാതങ്ങൾ എങ്ങനെ വ്യത്യാസപ്പെടുന്നു, സ്വകാര്യ വിവരങ്ങളോടുള്ള നിക്ഷേപകരുടെ അമിതമായ പ്രതികരണം, നിക്ഷേപകർക്ക് തോന്നുന്ന പക്ഷപാതങ്ങളും യഥാർത്ഥ വ്യാപാരരീതികളും തമ്മിലുള്ള വ്യത്യാസം എന്നിവ കണ്ടെത്താനാണ് ഗവേഷണം ലക്ഷ്യമിട്ടത്.

സെക്കൻഡറി വിപണി ഡാറ്റയും (നിഷ്ഠി 500 സൂചികയിൽ നിന്നുള്ളത്, VAR, SVAR മോഡലുകൾ ഉപയോഗിച്ച്) നിക്ഷേപകരിൽ നിന്ന് നേരിട്ട് ശേഖരിച്ച സർവ്വേ ഡാറ്റയും ഉൾക്കൊള്ളുന്ന ഒരു മിശ്രിത ഗവേഷണ രീതിയാണ് ഇതിനായി ഉപയോഗിച്ചത്. വ്യാപാരത്തിന്റെ അളവും ഓഹരി വരുമാനവും തമ്മിലുള്ള ബന്ധം പഠിക്കാൻ എക്കണോമെട്രിക് ടെക്നിക്കുകളും, സർവ്വേ ഡാറ്റ വിശകലനം ചെയ്യാൻ സ്റ്റാറ്റിസ്റ്റിക്കൽ രീതികളും പ്രയോഗിച്ചു. ഓരോ വിപണി ഘട്ടത്തിലും ഓഹരികളുടെ മൂലധന വലുപ്പം അനുസരിച്ചും വേർതിരിച്ചായിരുന്നു വിശകലനങ്ങൾ.

ഗവേഷണഫലങ്ങൾ സൂചിപ്പിക്കുന്നത്, അമിത ആത്മവിശ്വാസം സ്ഥിരതയുള്ളതും അനിശ്ചിതത്വമുള്ളതുമായ ഘട്ടങ്ങളിൽ പ്രകടമായിരുന്നു എന്നാണ്. എന്നാൽ, ബ്ലാക്ക് സ്വാൻ ഘട്ടത്തിൽ ഇത് ഇല്ലാതായി. ഇത് സൂചിപ്പിക്കുന്നത് വലിയ പ്രതിസന്ധി ഘട്ടങ്ങളിൽ നിക്ഷേപകർക്ക് അപകടസാധ്യതകളെക്കുറിച്ച് കൂടുതൽ ബോധമുണ്ടാകുന്നു എന്നാണ്. 'ഡിസ്പോസിഷൻ ഇഫക്ട്' (ലാഭമുള്ള ഓഹരികൾ നേരത്തെ വിൽക്കാനും നഷ്ടത്തിലുള്ളവ നിലനിർത്താനുമുള്ള പ്രവണത) എല്ലാ വിപണി ഘട്ടങ്ങളിലും സ്ഥിരമായി കണ്ടു. അനിശ്ചിതത്വമുള്ള സാഹചര്യങ്ങളിലും, പ്രത്യേകിച്ച് ചെറിയ മൂലധനമുള്ള ഓഹരികളിൽ ഇത് വർദ്ധിച്ചു. ചെറിയ മൂലധനമുള്ള ഓഹരികളിൽ മൊത്തത്തിൽ ശക്തമായ സ്വഭാവപരമായ പക്ഷപാതങ്ങളും വ്യാപാര സംവേദനക്ഷമതയും കണ്ടപ്പോൾ, വലിയ മൂലധനമുള്ള ഓഹരികളിൽ പ്രതികരണങ്ങൾ കൂടുതൽ നിയന്ത്രിതമായിരുന്നു. സ്വകാര്യ വിവരങ്ങളോട് നിക്ഷേപകർ അമിതമായി പ്രതികരിക്കുന്നതായും, തങ്ങൾക്ക് പക്ഷപാതങ്ങളുണ്ടെന്ന് അവർക്ക് അറിയാമെങ്കിലും, അവ തങ്ങളുടെ തീരുമാനങ്ങളെ എത്രത്തോളം സ്വാധീനിക്കുന്നു എന്ന് കുറച്ചുകാണുന്നതായും പഠനം കണ്ടെത്തി.

ചുരുക്കത്തിൽ, നിക്ഷേപകരുടെ പക്ഷപാതങ്ങൾ സ്ഥിരമായ മാനസിക സ്വഭാവങ്ങളല്ല, മറിച്ച് വിപണി സാഹചര്യങ്ങൾക്കനുസരിച്ച് മാറിക്കൊണ്ടിരിക്കുന്നവയാണെന്ന് ഈ പഠനം അടിവരയിടുന്നു. ഈ കണ്ടെത്തലുകൾ നിക്ഷേപകർക്കും, സാമ്പത്തിക ഉപദേഷ്ടാക്കൾക്കും,

റെഗുലേറ്റർമാർക്കും പ്രാധാന്യമർഹിക്കുന്നു. മാറിക്കൊണ്ടിരിക്കുന്ന വിപണി മാനസികാവസ്ഥയെക്കുറിച്ച് മനസ്സിലാക്കുന്നത് മെച്ചപ്പെട്ട നിക്ഷേപ തന്ത്രങ്ങൾക്കും, ഫലപ്രദമായ അപകടസാധ്യത ആശയവിനിമയത്തിനും, വിപണിയുടെ കാര്യക്ഷമത വർദ്ധിപ്പിക്കുന്നതിനുള്ള നിയന്ത്രണ സംവിധാനങ്ങൾക്കും സഹായകമാകും.

സൂചകപദങ്ങൾ: അമിത ആത്മവിശ്വാസ പക്ഷപാതം, ഡിസ്പോസിഷൻ ഇഫക്ട്, വിവരത്തോടുള്ള പ്രതികരണം, ബ്ലാക്ക് സ്വാൻ, ഗ്രേ സ്വാൻ, വൈറ്റ് സ്വാൻ, ഇന്ത്യൻ ഓഹരി വിപണി, നിക്ഷേപക പക്ഷപാതങ്ങൾ, കോവിഡ്-19, വിപണി മൂലധനം

Chapter 1

INTRODUCTION

1.1	Introduction	1
1.2	Statement of the Problem	4
1.3	Objectives of the Study	4
1.4	Significance of the Study.....	5
1.5	Scope of the Study.....	5
1.6	Period of the Study	6
1.7	Variables Used in the Study	6
1.8	Operational Definitions.....	7
1.9	Hypotheses of the Study	10
1.10	Limitations of the Study.....	11
1.11	Layout of the Study	11

1.1 Introduction

For decades, standard finance theories have portrayed investors as rational and markets as efficient. Do investors always make rational decisions in the stock market, or do psychological traps lead them astray? Traditional finance theories, rooted in the Efficient Market Hypothesis (EMH), assume investors act as rational utility maximisers who process all information perfectly. However, persistent market anomalies like bubbles, crashes, and predictable price deviations challenge this view. Standard finance overlooks cognitive biases and emotional influences that cause investors to deviate from rationality, resulting in inefficiencies unexplained by EMH. Behavioural finance addresses these gaps by integrating psychology into economic models, revealing how heuristics and sentiments drive suboptimal choices. Behavioural finance highlights the role of biases in creating market anomalies, offering a more realistic framework for understanding investor actions beyond rational assumptions. It explains deviations through empirical evidence of psychological factors shaping decisions. Under the rationality assumption, no single investor can gain or lose from the market. But it is apparent from every market around the globe that winning and losing are always part of investing. Behavioural finance emerged as a response to stock market anomalies that standard finance theories couldn't explain. It gained greater recognition when Kahneman and Smith received the Nobel Memorial Prize in Economic Sciences in 2002 for their extraordinary contributions to behavioural economics. With the advent of behavioural finance, the rational behaviour of investors has come under question. According to behavioural finance, irrationality in investors' behaviour leads to gains and losses from investments. It is a branch of behavioural economics that studies how human

emotions, psychology, biases, beliefs, cognitive limitations in information processing, and social factors influence financial decision-making.

Several studies are being conducted in this area covering various elements of behavioural finance. The psychology of investors and behavioural biases are the most common areas of research, as they directly affect stock market prices and trading volume. Behavioural biases are unconscious beliefs that influence our decisions. There are cognitive biases and frame-dependent biases. Rational and successful investing is all about restraining and channelizing the emotions of greed and fear, and understanding behavioural finance (Parag Parikh, 2011). Hence, it is important to study the emotions and biases present in every market.

Though many biases have been identified, overconfidence bias and disposition effect is considered to be prominent biases that influence the stock market, because overconfident investors carry riskier portfolios than rational investors (Odean, 1998), which is a threat to the overall economy and disposition effect has consequences in both upward and downward trends in the stock market and such investors hold suboptimal portfolios (Garling et al, 2017).

Overconfidence is the unwarranted faith in one's intuitive reasoning, judgments, and cognitive abilities. People believe that they are smarter and possess better information than they actually do. Overconfident investors overestimate their ability to evaluate a company as a potential investment. As a result, they ignore even negative information that could threaten their investment (Pompain, 2006). There are prediction overconfidence and certainty overconfidence. Prediction overconfidence states that while predicting values, people assign a very narrow range (Pompain, 2006). Investors may underestimate the downside risk to their portfolios. As people learn more about a situation, the accuracy of their judgments is unlikely to increase. However, their confidence does, as they fallaciously equate the quantity of information with its quality (Pompain, 2006). This is called certainty overconfidence.

According to De Bondt and Thaler (1985), the key behavioural factor in understanding the trading puzzle is overconfidence.

Loss aversion bias is observed in practice as the disposition effect. The disposition effect is the desire to hold losing investments too long (risk-seeking behaviour) and to sell winning investments too quickly (risk-avoidance behaviour) (Shefrin & Statman, 1985). Investors spend too much time on losing trades and do not give profitable trades enough time to work in their favour. A study conducted in China, a developing country like India, revealed that a large majority of investors exhibit the disposition effect (Shumway & Wu, 2006).

Both biases are present in almost every market, indicating that the Indian stock market is likely vulnerable as well. This research investigates overconfidence bias and the disposition effect in the Indian environment, encompassing various market conditions and capitalization categories. According to Taleb (2007), market states can be divided into three types: white swan, grey swan, and black swan events. White swan periods have stable conditions and events that are very probable to happen; grey swan periods have events that are rare but somewhat predictable; and black swan periods have extreme, unpredictable shocks.

The study examines the impact of these biases across several phases, utilizing trading data from prior to and during the COVID-19 epidemic. This method shows how overconfidence bias and the disposition effect work when the market and economy are more or less predictable. The research investigates the influence of stock market capitalization on these biases.

These insights equip market participants with strategies to recognise and mitigate biases during trading, while reinforcing the merits of portfolio-based investing. Policymakers gain guidance on implementing stability measures during periods of high uncertainty.

1.2 Statement of the problem

Despite increasing research into behavioural finance, significant gaps remain in understanding how overconfidence bias and the disposition effect influence investor decision-making in the Indian stock market, particularly during market phases marked by uncertainty and disruption (white swan, grey swan, and black swan events). The extent and impact of these behavioural biases on investor outcomes and stock performance are not fully established, especially across large-, mid-, and small-cap stocks. Moreover, the mechanisms driving overreaction to private information and possible underreaction to public information remain ambiguous. Additionally, this study addresses the discrepancy between investors' perceived behavioural biases and their actual trading patterns, which needs to be critically examined to inform better investment strategies and market regulation. This research aims to address these gaps by assessing, analysing, and comparing these behavioural biases and their consequences within the unique context of the Indian stock market across different market phases and market capitalisation.

1.3 Objectives of the study

The following objectives were set for the study:

1. To assess the extent and impact of overconfidence bias in the Indian stock market over white swan, grey swan and black swan phases.
2. To identify and analyse the presence of the disposition effect in the Indian stock market over white swan, grey swan and black swan phases.
3. To compare the overconfidence bias and the disposition effect across large-cap, mid-cap and small-cap stocks of the Indian stock market over white swan, grey swan and black swan phases.
4. To investigate the overreaction to private information signals in the Indian stock market.

5. To examine discrepancies between investors' perceived behavioural biases and their actual trading patterns.

1.4 Significance of the study

This study holds considerable significance, as it tries to fill the critical gaps in understanding investor behavioural biases-overconfidence bias and disposition effect-across white swan, grey swan, and black swan phases in the Indian stock market. By examining how market capitalisation affects investor psychology and trading patterns across large-, mid-, and small-cap stocks, the study sheds new light on market segmentation effects. The recent surge in retail investor participation in India amplifies the impact of these biases on stock market dynamics, especially in light of Bharadia (2025) findings. Furthermore, the research explores how overconfidence and disposition lead to shifts in trading volume, price volatility, and market stability, thereby engendering pronounced boom-bust cycles (Saxena et al., 2025). The increased penetration of digital broking platforms has led to greater risk-taking and bias-driven decision-making, particularly among new and less experienced investors (Gupta, 2025). The study also covers investors' overreaction to private information signals; based on this, actionable recommendations for investors, policymakers, and regulators are expected to be presented. Its findings will thus help develop and implement targeted interventions to enhance market efficiency and stability, especially during crises and periods of uncertainty.

1.5 Scope of the study

The scope of this study encompasses an in-depth investigation into behavioural biases, specifically, overconfidence bias and the disposition effect, within the Indian stock market. Utilising daily trading data from the Nifty 500. The intensity and persistence of these biases across white swan, grey swan, and black swan phases are examined at both index and individual stock levels from April 1, 2014, to March 31, 2022, in the Indian equity market. The study also conducts a comparative analysis of bias manifestation among the large-cap, mid-cap, and small-cap segments. This study,

based on quantitative analysis of real trading data, provides in-depth insight into the influence of overconfidence and disposition effects on trading volumes, price volatility, and market stability. Additionally, it examines how demographic factors frame these biases, assesses investors' perceptions of these biases, and compares them with the actual trading behaviour reflected in stock market data. The findings will aim to inform investors, policymakers, and market regulators about the implications of these biases and provide guidance on improving market efficiency and stability.

1.6 Period of the Study

This study was carried out during the 2022 to 2025 period. The secondary data for the study were collected for the period 1st April 2014 to 31st March 2022. Primary data required for the study were collected from April 2023 to December 2024.

1.7 Variables Used in the Study

- **Daily Trading Return:** Using the closing price as the basis for measurement, returns were calculated for both the Nifty 500 index and its constituent stocks.
- **Daily Trading Volume:** The total quantity of shares traded daily for each Nifty 500 constituent and for the index itself.
- **Daily Volatility:** Using the Parkinson's volatility model, the daily volatility of the index and stocks was computed with high and low daily prices.
- **Investment Experience:** The duration or level of an investor's experience in trading.
- **Gender:** Demographic characteristic recorded to examine behavioural differences in biases.
- **Investor Type:** Classification of participants into retail investors and Financial advisors to see the difference in biases.

- **Overconfidence Bias:** Measured using five structured statements designed to trace out certainty and precision overconfidence among them.
- **Disposition Effect:** Assessed through five specific statements capturing the propensity to sell winning stocks prematurely and retain losing stocks longer than optimal.
- **Response to Private and Public Information:** Evaluated using five items focused on how investors react to private information and publicly available information.
- **Investment Satisfaction:** Measured through two statements addressing the individual's level of satisfaction with their overall investment outcomes and decision-making process

1.8 Operational definitions

1.8.1 Overconfidence bias

It is a cognitive bias in which people overestimate their abilities, knowledge, or skills in doing something. It is the unwarranted faith in one's ability to predict the stock market and make better-than-average financial decisions. These people believe they are better at decision-making than an average person, they sense an illusory control over events, they show unrealistic optimism in their actions, and they mis-calibrate their skill and knowledge than they possess. They underestimate the downside risk of their investment, resulting in a below-average return.

1.8.2 Disposition effect

When people are loss-averse, they tend to sell the stocks that are starting to earn a return as soon as they start to earn, in fear of further price declines, and at the same time, they hold on to the losing stocks for a long time in the expectation of a price recovery in the future. The disposition effect arises from loss aversion and regret aversion, stemming from mental accounting biases among investors. This premature

selling and prolonged holding result in a suboptimal portfolio which yields below-average returns.

1.8.3 Private information and public information

Private information is information that an investor believes is exclusive to them. Overconfident investors assign greater weight to private information because they believe it is more accurate and reliable than public information. They underestimate the noise or uncertainty in private information and overreact to this. Public information is that information which is openly available to everyone. Overconfident investors underestimate the precision of this information and underreact to it, even when it has an immediate effect on their investments.

1.8.4 Large-cap stocks

Based on market capitalization, stocks are divided into large-, mid-, and small-cap stocks. Large caps are stocks with a market capitalization above ₹20000 crore and are generally ranked among the top 100 companies in an index. Blue-chip stocks come in this group. They are well-established, large-sized companies that can even influence the economy.

1.8.5 Mid-cap stocks

Medium-capitalization stocks are companies with a market capitalization between ₹5000 crore and ₹20000 crore. They are companies in the growth stage that are highly affected by market volatility. Typically, they are ranked 101st to 250th in the stock market.

1.8.6 Small-cap stocks

Stocks that have a market capitalization of less than ₹5000 crores are considered small-cap stocks. They are ranked above 250 in the stock market. They are highly vulnerable compared to large and medium stocks.

1.8.7 White swan phase

According to Taleb (2007), events can be classified into white swan, grey swan, and black swan phases based on their predictability and probability. The white swan is the stable phase, in which events can be predicted with high probability using historical experience or understanding of the system. In this study, the period prior to the COVID-19 pandemic (2014 to 2019) is considered the white swan phase.

1.8.8 Grey swan phase

During the grey swan phase, events will be less predictable but are not entirely unimaginable or unknown. Rare events will happen during this period, but can be predicted to some extent. The period from 1st January 2020 to 31st March 2022 is taken as the grey swan phase for this study.

1.8.9 Black swan phase

A black swan is the phase in which highly improbable and unpredictable events happen. Very rare, extreme outlier events with a high economic impact will occur in this phase. The nationwide lockdown occurred during the pandemic, and the highest worldwide casualty rate was unimagined and unpredictable; hence, the pandemic's inaugural year of 2020 is considered a black swan event.

1.8.10 Retail investors

They are individual non-professional investors who invest their hard-earned money in small amounts, compared to institutional investors. They primarily buy and sell for wealth creation, savings, growth, or retirement planning. They have limited access to information and sources as compared to professionals. Their decisions are influenced by behavioural biases, market sentiments, risk appetite, etc.

1.8.11 Financial advisors

Financial advisors are professionals who provide expert guidance and services to help individuals and institutions make informed investment and financial planning decisions. They have access to more comprehensive market research, tools, and professional networks, which enable them to make more sophisticated decisions and avoid common biases faced by retail investors.

1.9 Hypotheses of the study

H0a: The Indian stock market is not affected by overconfidence bias

H0b: The presence of overconfidence bias does not vary between different phases.

H0c: The overconfidence bias is the same in large, medium and small-cap indices.

H0d: The Indian stock market is not affected by the disposition effect.

H0e: The presence of disposition effect does not vary between different phases.

H0f: The effect of overconfidence bias and disposition effect is the same during all phases in all market capitalization stocks.

H0g: Investors with varying degrees of trading experience do not significantly differ in their belief that financial loss is more painful than financial gain.

H0h: Retail investors and financial advisors do not significantly differ in their propensity to sell shares as soon as their value rises.

H0i: Disposition effect does not differ by gender groups

H0j: The level of overconfidence bias does not vary between retail investors and financial advisors.

H0k: Overconfidence bias does not differ with the level of experience.

H0l: Overconfidence bias does not differ by gender groups.

H0m: Retail investors and financial advisors do not significantly differ in their levels of investment satisfaction.

1.10 Limitations of the study

- Only retail investors were considered; institutional investors were excluded.
- Only 441 Nifty500 stocks were analysed due to limited continuous data availability.
- The study could not adopt a random sampling method due to the unavailability of a sampling frame for equity investors in the Indian stock market.

1.11 Layout of the study

The study is divided into eleven chapters, followed by bibliography.

Chapter 1 begins with the introduction, discussing the statement of the problem, the scope, the importance, the objectives, the hypotheses, and the limitations of the study.

Chapter 2 provides a comprehensive literature analysis on overconfidence bias and the disposition impact in Indian and worldwide markets, concluding with the identification of the research gap.

Chapter 3 establishes the theoretical foundation, discussing the evolution of behavioural finance, major contributors, behavioural biases and a particular emphasis on overconfidence and disposition effects.

Chapter 4 explains the research methodology adopted by the study, such as the data, variables, sampling, tools used for analysis, etc.

Chapter 5 presents the results of the examination of overconfidence bias in the Indian stock market over different phases.

Chapter 6 gives the results of the disposition effect test over different phases are reported. **Chapter 7** examines both biases across different market capitalisations within swan phases.

Chapter 8 looks at how people react differently to information signals.

Chapter 9 reports the investor perceptions of overconfidence and disposition effects.

Chapter 10 summarises the results and conclusions.

Chapter 11 gives suggestions and ideas for further research. The study concludes with a complete list of references consulted.

Chapter 2

REVIEW OF THE LITERATURE

2.1	Introduction	13
2.2	Studies Related to Overconfidence Bias (OCB).....	13
2.2.1	The Overconfidence Bias in Global Markets.....	14
2.2.2	OCB in the Indian Stock Market.....	18
2.3	Studies related to Disposition Effect (DE)	20
2.3.1	The Disposition Effect in Global Markets.....	21
2.3.2	DE in the Indian Stock Market	25
2.4	Studies related to differential reaction to information.....	26
2.5	OCB and DE during the COVID-19 pandemic	28
2.6	Research Gap.....	29
	References.....	31

2.1 Introduction

Behavioural finance originated in the 19th century and has subsequently evolved, examining the behavioural dimensions of rational investing as posited by conventional finance theories. This section examines notable contributions by scholars regarding Overconfidence Bias, the Disposition Effect, and stock market responses during the COVID-19 epidemic. Later, the research gap identified in the literature is presented.

2.2 Studies Related to Overconfidence Bias (OCB)

People who overestimate their knowledge, precision, and control over events and outcomes are exhibiting OCB (Odean, 1998b). Literature has identified two types of OCB: prediction OCB and certainty OCB. Investors exhibiting prediction OCB permit no more than a ten percent variance in future prices. In contrast, those with certainty OCB exhibit excessive confidence in their stock selections and trading timing. Both biases involve greater-than-average risk, and ultimately, investors exhibiting OCB are destined to incur losses (Pompain, 2006).

Such investors make less accurate price forecasts, especially for hard-to-predict stocks, due to the hard–easy effect (Liu & Tan, 2021). It manifests variably across gender, experience, and expertise. Male investors exhibit greater overconfidence in their investment behaviour than female investors (Barber & Odean, 2001; Mishra & Metilda, 2015). When we evaluate the investors' experience, a new trader typically does not exhibit overconfidence until they begin to generate profits from their investments; at that point, their view of their skills and expertise reaches its zenith, leading to overconfidence. However, further enhanced understanding and experience in investment appear to diminish their overconfidence, leading to a greater propensity for rational investing (Gervais & Odean, 2001). Investors depend on professional

financial advisors for sound investments, but research on OCB among professional and non-professional investors reveals differing perspectives among scholars. Tongren and Montgomery (2004) reported that prediction overconfidence was equivalent across both groups in a study conducted in Stockholm. Similarly, Menkhoff (2013) found that professionalism does not reduce overconfidence in predictions. Glaser et al. (2005) and Puetz and Ruenzi (2011) have indicated that professionals exhibit greater overconfidence than laypersons.

As reported in the literature, when investors start to make a profit, their confidence peaks (DHS, 1998; Odean, 2001). Chuang and Lee (2008) reported that investors who exhibit self-attribution bias are more affected by the OCB. They engage in aggressive trading, which increases market volume and volatility. He has also reported that when investors are overconfident, they tend to overreact to private information and underreact to public information. They overtrade relative to average investors by underestimating downside risk and overestimating their predictive capacity, resulting in a less-than-ideal portfolio (Barber & Odean, 2001; De Bondt & Thaler, 1995). Odean's (1998b) research investigated individual investors' trading behaviour using brokerage data and found that overconfident investors trade too much and earn lower returns. This study laid the foundation for examining the OCB in financial markets, and subsequent studies have been conducted worldwide, using both primary and secondary data. This overtrading makes the market volatile, causing the mispricing of stocks' fundamental values (DHS, 1998).

2.2.1 The Overconfidence Bias in Global Markets

The most important note on OCB is that it is present in almost every stock market (Deaves, 2010). Scott et al. (2003) tested the overconfidence hypothesis in numerous global equity markets and found that investor overconfidence skews asset values globally. High-growth companies benefit from momentum strategies that entail buying stocks with upward earnings projection revisions and selling stocks with downward revisions. However, contrarian tactics that favour low price-to-earnings ratios work better for low-growth corporations. These trends show that value portfolio managers may do best by investing in slow-growing stocks. However, growth

portfolio managers should ride favourable momentum and sell equities fast when things go wrong.

Abbes et al. (2009) investigate OCB in the French market, seeking empirical data to substantiate the existence of OCB and the role of self-attribution bias within it using GARCH model. The research utilized secondary data from the Paris Stock Exchange over a decade. Their findings indicate that overconfident investors tend to overreact to private information while underreact to public information; furthermore, investment success amplifies overconfidence, leading to increased trading volume. When investors accurately predict future profits, they become overconfident and trade more in subsequent periods.

Deaves et al. (2008) conducted experimental research on asset market and found that overconfidence can trigger trading and identified three types: calibration-based overconfidence, the better-than-average effect, and the illusion of control. Results indicate that overconfidence, particularly calibration-based overconfidence, significantly fosters trading activity, and that the better-than-average effect also has an equally strong influence at both the individual and overall market levels. Additionally, they examined the impact of gender on overconfidence and found that both men and women are affected by OCB. In the Canadian market, males did not exhibit any greater overconfidence than women, while in Germany, men traded more than women.

Park et al. (2013) conducted an analysis based on an innovative Field Study involving 502 investors on a stock message board portal in South Korea and examined how virtual societal information influences trading behaviour and performance. Based on thorough insights into psychological knowledge, they put forward a hypothesis that investors engage with opinion-forming posts that enhance confirmation bias and amplify the contamination of results by boosting self-confidence. Results confirm this assumption and show that high confirmation bias was related to high self-confidence, high trading activity, optimistic performance expectations, and eventually reduced actual performance outcomes.

Tekce and Yilmaz (2015) investigated the pattern of overconfidence among retail investors in the Turkish stock market with a nationally representative data set and found that the phenomenon is pervasive, particularly among males, young investors, those with smaller portfolio values, and in areas with lower incomes and education. The bias clearly hurts their net portfolio wealth. It is one of the first nationwide investigations in the Turkish context and combines knowledge from behavioural finance theory with an emerging market environment.

Metwally and Darwish (2015) conducted empirical research from 2002 to 2012 in the Egyptian stock market, examining the relationship between market returns and market volume across various market conditions. The entire period was segmented into four sub-periods: two stable upward trends (2005-2005 and 2005-2008) and two turbulent declining trends (the financial crisis, 2008-2010, and the Egyptian Revolution Period, 2010-2012). The study's results indicate a considerable influence of historical market returns on present turnover, demonstrating the existence of OCB in the market. Market States significantly influence trading activity in the Egyptian Stock Market, particularly during upward trends. Investor overconfidence catalyses trading activity during upward trends on the Egyptian Stock Market.

Bouteska & Regaieg (2017) examine how financial analysts' recommendations affect overconfidence and over/under-reaction to past earnings and how these factors affect Tunisian stock market investment decisions. Their research suggests that overconfidence in analysts can be explained by their forecast accuracy or by how clearly they recommend. The analysis also used panel regression models with 2010–2015 annual and bi-annual data. The empirical test showed that Tunisian Stock Market analysts were overconfident in their forecasts and overreacted to prior earnings fluctuations. Self-confidence was higher for self-confident forecasts with recommendations, but overreaction was higher for unequipped forecasts.

Bouteska and Regaieg (2017) investigated the overconfidence and loss aversion biases in industrial and service-sector firms in the US stock market, utilizing Ordinary Least Squares (OLS) regression models and two panel data models. The study reported that OCB positively influences the market performance of industrial firms,

possibly because aggressive investments and risk-taking drive market valuations. In contrast, it adversely affects the valuation of service firms.

Shrestha (2019) investigated OCB in the Nepalese stock market using a questionnaire, employing descriptive statistics and an analytical approach, and reported the presence of the bias in investment decisions, especially among women, college-educated respondents, and individuals with a net worth of 2 to 5 million.

Qasim (2019) collected data from the trading of the 27 most active stocks on the Karachi Stock Exchange to study the impact of stock returns on trading volumes. The study examined the Pakistan stock market and found that confirmed security stocks influence trading volumes significantly, but trading volumes do not affect stock returns. The volatility of stock returns affects stock returns but not trading volumes, indicating that the overconfident investors from Pakistan continue to trade even when there is high volatility. The impulse response function based on a VAR model confirmed that a stock return shock with a one-standard-deviation increase leads to an increase in trading activity that is overall positive and persistently above its equilibrium level.

Parhi and Pal (2022) on the Indian High Net Worth Individuals (HNIs) adopt a combination of both qualitative and quantitative research methodologies to measure OCB identified in personal decision-making and equity investment decisions to create behavioural indicators for reasonable investor behaviour. Exploration components, such as literature reviews and personal interviews with investors, fund managers, and subject matter experts, helped to hone study variables for content validity. However, the findings indicate that OCB exists to some extent, as evidenced by stock-forecasting mistakes, overtrading, analytical overkill, and reactive behaviour.

Bernile et al. (2025) model of investor overconfidence from a Bayesian perspective identifies two underlying mechanisms: biased priors that favour overconfidence before entering the market, and biased learning, in which instances of outperforming the market are overweighted. Empirical evidence confirms that biased learning maintains overconfidence mainly in investors' early years, although this characteristic declines over time, it remains pervasive over more extended periods.

Over the past three decades, global research has been able to record the prevalence of the Overconfidence (OC) Bias in various equity markets to recognise important determinants, which include demographic variables (gender, age, experience, etc.), as well as joint effects of complementary biases such as Confirmation Bias, Illusion of Control, and Self-Attribution bias.

2.2.2 OCB in the Indian Stock Market

Many researchers have reported the presence of OCB in the Indian Stock market.

Prosad et al. (2017) conducted a study on the effects of OCB and DE on trading volume, examining which bias exerts a stronger influence on the Indian stock market. The research indicated that overconfidence and the DE dominate the Indian equity market. The comprehensive findings from VAR indicated a favourable combined effect of the two biases on transaction volume, even when accounting for volatility. They determined that overconfidence is the more prevalent of the two biases. Upon further examination, it was determined that these prejudices affect nearly all industries, regardless of their nature or attributes, indicating that the prevalence of these biases is not confined to any particular business.

Kumari (2017) conducted a study among investors in the eastern states of India to examine the influence of behavioural biases on investing decisions. The findings corroborated the existence of behavioural biases, concluding that these biases influence investment decisions in the capital market, leading investors to deviate from the logical thought processes of traditional financial methodologies. The study identified six aspects of overconfidence: optimism, overestimation, over placement, self-esteem, self-mastery, and unrealistic optimism.

Mirji (2017) attempted to analyse the Overconfidence bias among investors in the Indian market, focusing on the BSE Sensex and primary data from investors in the Karnataka region, concluded that male investors rely more on self-analysis and media/expert evaluations of stock trading. In contrast, female investors rely exclusively on brokers' analyses. OCB appears to affect the investment behaviour of male investors, whereas risk aversion bias appears to affect that of female investors.

In another study by Sapar (2017), trading data for Nifty50 constituents were considered, portfolios were created based on stock turnover, and returns were analysed for high- and low-turnover portfolios. On comparing the returns in both portfolios, no significant difference was observed; hence, he reported a contrasting result from other studies in the Indian market: no evidence of OCB was found during the 2005-2015 period in the Indian stock market.

Mushinada and Veluri (2018) used market-level data from BSE, employing impulse-response analysis via bivariate vector autoregression and EGARCH models to uncover the presence of self-attribution bias alongside overconfidence. Results confirm the overconfidence hypothesis-overconfident investors overreact to private signals and underreact to public information. EGARCH estimates further confirm that successful forecasts lead to self-attribution, which in turn bolsters confidence and enhances trading volumes. It is also seen that such excessive trading feeds into observed spikes in market volatility. These findings prompt investors to conduct post-trade reviews to identify recurring behavioural errors, which may help mitigate utility losses from these biases. This is the first such market-wide analysis in the Indian context.

Ganesh et al. (2022), analysing OCB in the Indian stock market, assume that investors, with limited time for technical or fundamental analysis, resort to irrational behaviour based upon excessive trust in limited data. Using the VAR methodology, the study, including the post-globalisation period encompassing the GFC in 2007-2008 and COVID-19, shows the effects of bias over more than 110 trading days, thereby rejecting the assumptions of the EMH.

Azam and Baig (2020) used a VAR framework, as proposed in Statman et al. (2006), to analyse the Indian stock market from January 1, 2001, to June 30, 2020, and verified the presence of the OCB through significant lagged effects of returns on market turnover. Findings from the study include poor forecasting of return behaviour relative to trading activity, the considerable impact of volatility on trading volume, and a two-way causality between exchange rates and returns.

By analysing data collected through a questionnaire, Bhatia et al. (2025) examined how OCB influences the investment decision-making of Indian equity investors and how it affects market efficiency by adopting EFA, CFA, Mediation and modelling, revealing the mediating role of investment decisions between overconfidence and market efficiency.

In another study, Kumar et al. (2025) researched the heuristic fallacies of overconfidence and underconfidence within the context of decision-making for both short-term and long-term investment horizons of Indian investors. A structured questionnaire was employed for data collection, and the data were analysed using SPSS 22 software and the PLS-SEM methodology in Smart PLS. Evidence indicates a positive correlation between overconfidence and both short-term and long-term investment decisions. In contrast, underconfidence shows no correlation with short-term decisions and exhibits no negative correlation with long-term choices. Outcomes are somewhat supported within the broader context of global studies related to the former, whereas no related studies are available for the latter.

A study by Nair and Shiva (2025) utilised exploratory factor analysis (EFA) on data from responses from 764 Indian retail investors to identify the core components of OCB (OB). These findings were subsequently validated through a series of formative assessments of four factors—accuracy, perceived control, positive illusions, and investment success—conducted with 489 participants using PLS-PM in Smart PLS 4.0. The study emphasises positive illusions and success factors as the primary determinants of OB's influence on investment decision-making, featuring a newly developed formative index with potential applications for investment advisors, portfolio managers, and the theory of illusion of control within contemporary portfolio management frameworks.

2.3 Studies related to Disposition Effect (DE)

The motive behind investing is to make a profit, and nobody wants to lose their money in the stock market. Hence, the decision to sell a stock is crucial for any investor. Investors decide to sell a stock based on a reference point, generally the purchase price (Weber & Camerer, 1998). So, the decision to trade is made by considering whether

the stock is a winner if the value increases or a loser if the value decreases (Barberis & Xiong, 2007). Moreover, investors often exhibit differential behaviour towards winning and losing stocks. Some investors sell off the stocks as soon as they gain some profit, while at the same time they hold on to the losing stocks in the expectation of a recovery. This behaviour is termed the DE by Shefrin and Statman (1985).

The DE arises from the prospect theory proposed by Kahneman and Tversky (1979), which elucidates the tendency to assign unequal significance to the satisfaction derived from gains and the distress associated with losses. They discovered that the anguish associated with financial loss outweighs the satisfaction derived from an equivalent investment gain. Loss aversion gives an additional rationale for the DE. Investors tend to liquidate their profitable assets prematurely due to apprehension of potential price depreciation and the forfeiture of accrued gains. At the same time, they retain their underperforming assets because they are reluctant to confront the reality of their losses, believing that a loss materialises only upon the actual sale and realisation of cash (Shefrin & Statman, 1985).

The DE leads to suboptimal portfolio returns, as investors overlook overall portfolio performance and disproportionately focus on individual stock returns (Geotzmann & Massa, 2003).

2.3.1 The Disposition Effect in Global Markets

This section examines the literature pertaining to DE across diverse markets.

Geotzmann and Massa (2003) used a comprehensive dataset of individual investors over a six-year period in the 1990s and identified disposition-prone investors in the US stock market. The findings suggest a positive correlation between increased purchases by irrational investors and the reduction of stock price anomaly components across the cross-sections. The hypothesis that systematic contributions of transactions between disposition investors and other investors are related to relative stock price movements has been confirmed.

Barber et al. (2007) studied the Taiwan stock market. They reported that individual investors rapidly sell winners than losers. In contrast, individuals and institutional

investors are reluctant to sell losing stocks, whereas foreign investors and mutual funds did not exhibit the DE.

In the Pakistan stock market, the DE was observed in the form of quick selling of winners and holding losers for long. Wajid (2013) provides empirical confirmation of the DE as a mediator, using a survey of mutual funds and structural equation modeling. However, it fails to test its effect on portfolio returns and individual stock performance.

An et al. (2024) found a portfolio-driven DE in an experimental study using US and Chinese trading data across four independent settings, using various regression models. They reported the presence of bias at the stock and portfolio levels and also found the prominence of bias in losing stocks (or the portfolio) relative to winners. Another study utilizing two independent stock broking data sets from the UK and the US by Sakaguchi (2019) reported that investors look at the gain and loss in various stocks in their portfolio and then consider selling the gainers in both markets, clearly depicting the DE.

Brettschneider et al. (2021) analyse the US stock trading data and interpret that disposition impact inversely correlates with the fraction of winning stocks in a portfolio. Investors tend to sell their underperforming stocks after evaluating the winning stocks in their portfolio; the greater the number of winners, the more inclined they are to divest from their losing stocks.

Leal et al. (2018) expanded the investigation of the DE by analysing the strategy of selling winning assets and purchasing losing ones among investors. It was revealed that retaining losing investments and acquiring additional units of underperforming assets were prevalent among less sophisticated investors, indicating a continuation of biased behaviour. This leads to subpar portfolio returns.

Dierick (2019) investigated the DE and financial attention among investors utilizing a dataset from a Belgian discount broker, concluding that more investor attentiveness correlates with less bias. The role of risk-taking and demographics on the DE was investigated by Oreng et al. (2021) among the Brazilian investors and reported that

the risk-averse investors are more prone to this bias, and it is more evident during bear markets than in bull markets. They also reported that the female counterparts are more affected by the bias, age has no effect, and less sophisticated investors are less prone to this bias.

Kajol et al. (2020) examined the elements that affect the disposition impact using Social Network Analysis. Upon analyzing several aspects from the literature and utilizing the Delphi approach, they developed the questionnaire, and the gathered results indicated that social trust and investor emotions are the primary factors determining the bias.

Danbolt et al. (2021) used data from a European fintech platform to compare and analyse private and publicly visible portfolios to assess the DE. They discovered that publicly available information lessens bias in publicly open portfolios as opposed to private ones. Therefore, by giving the traders knowledge, the prejudice can be lessened.

Kesuma (2022) determined how stock splits affect the DE using stock split and trading data from the Indonesian stock market. They recognised the role of the stock split on the bias, and the bias decreases as the stock split ratio increases. A study conducted in the Iranian market indicated that the DE is more significant when investors enter the market during periods of high volatility, low returns, and uncertainty. The research indicated that trading experience, age, and gender affect biased behaviour (Eyvazloo et al., 2024).

Subedi and Dangol (2025) reported the influence of the DE on trading decisions among investors in the Nepalese stock market, noting that this bias intensifies with increased investment expertise. Jin et al. (2021) investigated the influence of social interaction via social trading platforms on investment decisions and DE. The exchange of information via these platforms diminishes information uncertainty, hence contributing to a reduction in DE.

Quispe-Torreblanca (2025) discovered a new investor reference point related to stock sales. Every time an investor logs into the trading site, they check the current price

against their previous login price. If the price has dropped, they decide to hold onto the stock rather than sell it.

Existing literature shows complex patterns of trading experience and the DE. Feng and Seasholes (2005) and Dhar and Zhu (2006) showed decreased DE for experienced traders with ample financial means and expert knowledge. Another study by Calvet et al. (2009) on Swedish households indicated that they were more inclined to sell entire portfolios of stocks following gains in their portfolios. Seru et al. (2010) differentiated types of experience in which accumulated trading activity deploys a stronger correction on the effect than experience itself.

A theoretical effort proposed by Barberis and Xiong (2006) suggests using “realization utility” as a concept that assumes that investors get a certain psychological benefit from realizing their gains. On a contradictory view, a study conducted by Locke & Mann (2015) observes that professionals involved in futures trading continue to show a DE, as their losing positions are prolonged during a bear market, which increases financial pressure on them.

Research has demonstrated a correlation between investor demographics and the DE (DE), with gender serving as a significant influencing element. In the initial study, Feng and Seasholes (2005) examined a cohort of 1,500 Chinese investors and determined that the loss realization ratio for males exceeded that of females. The digital engagement of investors under 35 years was more pronounced among the younger demographic. Individuals with less expertise exhibited a greater propensity to be swayed by the DE compared to pros. The second study, undertaken by Ahn (2021), examined transaction data from 76,172 KRI investors between 2015 and 2018. The results indicated that the primary factors influencing DE were gender disparities, loss aversion, and sophistication.

Dhar and Zhu (2006) discovered that financial knowledge, asset valuation, occupation, and trading activity mitigate DE. The significance of experience as an AD modifier is validated by Calvet et al. (2009) and Seru et al. (2010) time supersedes experience in cumulative trades.

To conclude, significant moderators of DE for female investors include past trading experience, demographic characteristics, behavioural patterns, market circumstances, and environmental factors. While longer trading periods reduce mean-reversion-induced losses, portfolio diversification consistently lowers DE propensity. Contextual differences are revealed by cross-market study; disparities in economic status among nations result in different DE manifestations. Compared with male investors, female investors typically exhibit higher DE, greater loss aversion, stronger biases, and fewer realised capital losses. An efficient debiasing technique for enhancing the decision-making efficiency of Saudi Arabian female investors is the optimization of lifetime consumption utility, or the proper trade-off between one's desire to achieve benefits now and future predicted gains.

2.3.2 DE in the Indian Stock Market

The Indian stock market has also been quite interested in the DE. The main contributions by earlier researchers are listed below.

In order to identify anchoring bias and DE in both stable and volatile markets, Arora and Rajendran (2023) conducted an experimental study among Indian stock market participants and found that both biases were present. Additionally, they stated that their portfolio returns are worse than those of those who displayed anchoring bias and that the DE is particularly noticeable during volatile markets.

Bharandev and Rao (2019) found that the DE is present in the Indian stock market, where profitable trading days positively influence unusual trade volumes, as evidenced by an ANOVA analysis of 500 NSE500 index stocks using 52-week high and low prices as reference points. Gupta and Bhardwaj (2020) investigated the impact of the DE on volatility in the Indian stock market and found no effect, although OCB and herding behavior demonstrated an influence on volatility.

Prosad et al. (2017) and Ganesh et al. (2020) investigated the occurrence of DE and OC in the Nifty50 index of the NSE, revealing that both biases are present, with OC predominating over DE in the Indian stock market. Safeeda and Ganesh (2024) investigated the DE throughout both the pandemic and pre-pandemic periods using

the Nifty50 index, revealing that the bias was more substantial during the uncertain pandemic phase.

On examining the behavioural biases affecting the investors in the Indian equity market, Kanojia et al. (2018) found the representative bias, OCB and DE as the most influential biases. The DE is more prevalent among individual investors, influenced by demographic parameters such as age, gender, experience, and investment sophistication. On the other hand, the DE may or may not influence institutional investors and mutual fund managers. The disposition impact is regarded as mutable for diverse categories of mutual funds, institutional investors, and individual investors (Zahera & Bansal, 2019).

2.4 Studies related to differential reaction to information

Investors can obtain information from various sources, including financial statements, public rumours, news articles, and analyst discussions (Slamecka & Graf, 1978). Passive investors depend on publicly available information, while active traders invest time in analysing stock trends and fundamentals to get their own significant insights (Malikov, 2019; Ball, 2025). As their engagement intensifies, their confidence in the accuracy of the information also escalates (Greenwald, 1980). Overconfident investors are more likely to act on private knowledge rather than public information. Daniel et al. (1998) examined the influence of private information on overconfidence levels and delineated two categories of OCB: static and dynamic OCBs. When an individual overestimates the accuracy of their private knowledge, this constitutes static OCB. Conversely, when public information aligns with their guess, self-attribution bias occurs, representing dynamic OCB.

The seminal work of Daniel, Hirshleifer, & Subrahmanyam (1998), a.k.a. the DHS model, established the theory of the relation of overconfidence with the process of asymmetric information. In this model, it is hypothesised that investors make self-attribution with a biased vision. This results in overreactions based on private information for the initial stages and a subsequent correction of this error in the form of an underreaction based on public information.

Chuang and Lee (2008) analysed data from Taiwanese brokerages between 1992 and 2002. Using bivariate Vector Autoregression on return data and trading volume, they established that returns Granger cause trading volume, indicating overconfident traders are indeed overreacting to private information, but not vice versa, indicating a lack of public information overreaction. The result holds particular significance for stocks with high idiosyncratic volatility.

Boussaidi (2013) researched the overconfidence-overreaction hypothesis using Tunisian stock returns from 2005 to 2010. The regression analysis of returns, decomposing returns using firm-level panel methods, finds that 33% of stocks have significant overreaction to private information ($\alpha_1 > 0$) and predict returns 1-3 months ahead. The result becomes more prominent for smaller, less liquid stocks.

Correspondingly, in analyzing self-attribution-driven overconfidence in the market, Mushinada et al. (2018) employed EGARCH with bivariate specifications, focusing on market data from the Bombay Stock Exchange (2000-2015). By results, note that positive past returns amplify overconfidence, thereby triggering volume spikes due to self-attribution effects. Return shocks have persisting effects on turnover (private information overreaction) but lack reverse Granger links (public information underreaction). Approximately 20% of returns are driven by overconfident, excessive trading based on variance decompositions, thereby providing direct market confirmation for your ideal swan cycle period extension in the proposed thesis framework.

Following Statman et al. (2006), Zia et al. (2017) employed bivariate VAR models to the Karachi Stock Exchange-100 series (KSE-100) using daily data from 2005 to 2014. The results from the IRFs indicate that Granger causality runs from returns to turnover, with a lag, but not from turnover to returns, supporting the idea that overconfident overreaction to private information causes volume spikes that persist for 5-10 days. The variance decompositions find

Boussaidi (2022) examined the effects of OCB on trading volume and volatility across varying degrees of private information, utilizing price non-synchronicity as a proxy for the availability of private information to investors in 10 MENA stock markets. The

study indicated that trade volume rises with the escalation of private information, suggesting that overconfident investors tend to overreact to such information.

2.5 OCB and DE during the COVID-19 pandemic

During the COVID-19 epidemic, OCB was more common in emerging markets like China, Taiwan, Turkey, Jordan, and Vietnam. In contrast, investor confidence fell in developed markets. Shrotryia and Karla (2023) looked at this phenomenon using daily market data from 46 global marketplaces. We used VAR models to learn more about how investors changed their behaviour.

Investors on the Indonesian Exchange (IDX) were analysed to comprehend the influence of DE on investment decisions during the COVID-19 period. The study indicated that the bias is especially pronounced among Generation Z, women, and investors with lower levels of education. Simultaneously, information disseminated via social media exacerbates bias; yet, bias is diminished among investors' own rumour stocks. The study also identified negative DE among stock market professionals (Asnavi et al., 2021).

Before COVID-19, OCB was more common in cyclical sectors, including Media, Metal, and Realty. During the pandemic, however, investors' attention shifted noticeably toward the IT and Pharma industries. The Energy sector, on the other hand, did not show any symptoms of OCB. The research used daily sectoral indices from the NSE from 2015 to 2020 and employed the VAR approach (Azam et al., 2022).

Kumar and Prince (2022) investigated the OCB in the Indian stock market using the BSE 100 index during pre-, during, and post-crash periods, covering the 2008 stock market crash and the COVID-19 pandemic, using VAR, Granger causality, and IRF. According to their research, the Indian stock market exhibits overconfidence during stable times but does not exhibit OCB during or after crises.

Kuranchie-Pong and Forson (2022) reported the presence of OCB among market players on the Ghana Stock Exchange during the Covid-19 pandemic, as evidenced by unidirectional Granger causality and GARCH models.

A study by Jin et al. (2023) in China indicates that during the epidemic, DE decreased due to heightened risk aversion, financial necessity, and diminished status quo bias. In another study by Vagnani and Mazzurco (2022), it was observed that investor sentiment declined due to adverse life events stemming from COVID-19. Batool and Akhtar (2023) reported that the DE had an adverse effect on stock market returns during the Pandemic period, similar to the effect of the number of COVID-19 cases reported on the Pakistani stock exchange. Similar findings were reported by Goossens and Knoef (2020) in the Dutch market, demonstrating the negative impact of DE on stock returns. In another study (2022), they reported that the DE showed a negative correlation with the number of COVID-19 hospitalised cases.

During the pandemic period Barreto et al. (2023) investigated the DE in the Brazilian market using the Odean (1998) model and reported the bias in the market except in March in which market were undergoing pandemic stress.

Rabbani et al. (2024) investigated OCB in Canadian and Italian stock markets during the COVID-19 pandemic using seven years of trading data. VAR and IRF results showed strong OCB in both markets during the pandemic and pre-pandemic periods. They also reported that, along with trading volume, liquidity also influences the OCB.

Literature indicates contradictory conclusions about the prevalence and absence of OCB and DE during the epidemic across various markets.

2.6 Research Gap

Despite extensive advances in behavioural finance, several critical research gaps remain in the current literature. No existing study has systematically compared investor behavioural biases across distinct swan phases (white, grey, and black swan events) in any market context, leaving the dynamic nature of biases underexplored. Additionally, prior research has not examined overconfidence and the DE across market capitalisation segments, such as large-, mid-, and small-cap stocks. The Nifty 500 index itself remains an underutilised resource for behavioural analysis, despite its broad coverage of over 92% of stocks listed on the National Stock Exchange of India. Furthermore, literature on the Indian stock market rarely investigates the differential

investor response to private versus public information signals. Lastly, the gap between investor perception of their own behavioural biases and their actual trading actions remains insufficiently explored, representing an important avenue for understanding and improving market behaviour and efficiency.

References

- Ahn, Y. (2022). The anatomy of the disposition effect: which factors are most important?. *Finance research letters*, 44, 102040.
- An, L., Engelberg, J., Henriksson, M., Wang, B., & Williams, J. (2024). The portfolio-driven disposition effect. *The Journal of Finance*, 79(5), 3459-3495.
- Arora, R., & Rajendran, M. (2023). Moored minds: An experimental insight into the impact of the anchoring and disposition effect on portfolio performance. *Journal of Risk and Financial Management*, 16(8), 349.
- Asnawi, S. K., Siagian, D., Alzah, S. F., & Halim, I. (2022). Does disposition effect appear on investor decision during the COVID-19 pandemic era: Empirical evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, 9(4), 53-62.
- Azam, M. Q., & Baig, M. A. (2020). Does Confidence Bias Exist in Indian Stock Market?. In *Does Confidence Bias Exist in Indian Stock Market?: Azam, Qamar*. [SI]: SSRN.
- Azam, M. Q., Hashmi, N. I., Hawaldar, I. T., Alam, M. S., & Baig, M. A. (2022). The COVID-19 pandemic and overconfidence bias: The case of cyclical and defensive sectors. *Risks*, 10(3), 56.
- Ball, R., Hofmann, C., & Löffler, A. (2025). The Role of Public Information in Capital Markets with Investors of Unknown Risk Attitudes. *European Accounting Review*, 34(4), 1529-1553.
- Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The quarterly journal of economics*, 116(1), 261-292.
- Barber, B. M., & Odean, T. (2001). The internet and the investor. *Journal of Economic Perspectives*, 15(1), 41-54.

- Barber, B. M., Lee, Y. T., Liu, Y. J., & Odean, T. (2007). Is the aggregate investor reluctant to realise losses? Evidence from Taiwan. *European Financial Management*, 13(3), 423-447.
- Barberis, N., & Xiong, W. (2007). Realization utility: a psychology-based model of investor trading behavior. *Available at SSRN 1008169*.
- Barberis, N., & Xiong, W. (2009). What drives the disposition effect? An analysis of a long-standing preference-based explanation. *the Journal of Finance*, 64(2), 751-784.
- Barreto, P. L. D. A., Barbedo, C. H. D. S., & Camilo-da-Silva, E. (2023). Disposition Effect: Brazilian Investors' Behavior during the Covid-19 Pandemic. *BBR. Brazilian Business Review*, 20(1), 1-17.
- Batool, Z., & Akhtar, H. (2023). MARKET RETURNS UNDER VOLATILITY, LIQUIDITY, INFORMATION ASYMMETRY, DISPOSITION EFFECT DURING COVID. *Pakistan Journal of Social Research*, 5(01), 157-169.
- Bernile, G., Bonaparte, Y., & Delikouras, S. (2025). Stock market experience and investor overconfidence: Do investors learn to be overconfident?. *Journal of Banking & Finance*, 174, 107431.
- Bharandev, S., & Rao, S. N. (2019). Disposition effect at the market level: evidence from Indian stock market. *Review of Behavioral Finance*, 12(2), 69-82.
- Bhatia, A., Chandani, A., & Divekar, R. (2025). Impact of Overconfidence Bias on Perceived Market Efficiency—The Mediating Role of Investment Decision-Making of Indian Individual Investors. In *Securing the Future through Sustainability, Health, Education, and Technology* (pp. 98-105). Routledge.
- Boussaidi, R. (2022). Implications of the overconfidence bias in presence of private information: Evidence from MENA stock markets. *International Journal of Finance & Economics*, 27(3), 3660-3678.
- Bouteska, A., & Regaieg, B. (2020). Loss aversion, overconfidence of investors and their impact on market performance evidence from the US stock markets. *Journal of Economics, Finance and Administrative Science*, 25(50), 451-478.

- Brettschneider, J., Burro, G., & Henderson, V. (2021). Wide framing disposition effect: An empirical study. *Journal of Economic Behavior & Organization*, 185, 330-347.
- Calvet, L. E., Campbell, J. Y., & Sodini, P. (2009). Measuring the financial sophistication of households. *American economic review*, 99(2), 393-398.
- Danbolt, J., Eshraghi, A., & Lukas, M. (2022). Investment transparency and the disposition effect. *European Financial Management*, 28(3), 834-865.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. *the Journal of Finance*, 53(6), 1839-1885.
- Deaves, R., Lüders, E., & Luo, G. Y. (2009). An experimental test of the impact of overconfidence and gender on trading activity. *Review of finance*, 13(3), 555-575.
- Deaves, R., Lüders, E., & Schröder, M. (2010). The dynamics of overconfidence: Evidence from stock market forecasters. *Journal of Economic Behavior & Organization*, 75(3), 402-412.
- Dhar, R., & Zhu, N. (2006). Up close and personal: Investor sophistication and the disposition effect. *Management science*, 52(5), 726-740.
- Dierick, N., Heyman, D., Inghelbrecht, K., & Stieperaere, H. (2019). Financial attention and the disposition effect. *Journal of Economic Behavior & Organization*, 163, 190-217.
- Eyvazloo, R., Raei, R., & Rezaei, F. (2024). Stock Market Entry Timing and Retail Investors' Disposition Effect. *Financial Research Journal*, 26(4), 940-962.
- Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets?. *Review of finance*, 9(3), 305-351.

- Ganesh, R., Naresh, G., & Thiyagarajan, S. (2020). Manifesting overconfidence bias and disposition effect in the stock market. *International Journal of Business and Economics*, 19(3), 257-284.
- Ganesh, R., Thiyagarajan, S., Vasudevan, G., & Naresh, G. (2022). INVESTORS' OVERCONFIDENCE IN THE STOCK MARKET. *Copernican Journal of Finance & Accounting*, 11(4), 107-123.
- Gervais, S., & Odean, T. (2001). Learning to be overconfident. *The review of financial studies*, 14(1), 1-27.
- Glaser, M., Langer, T., & Weber, M. (2005). Overconfidence of professionals and lay men: Individual differences within and between tasks?. *None*. SONDERFORSCHUNGSBereich 504 WORKING PAPER SERIES
- Goetzmann, W. N., & Massa, M. (2003). Disposition matters: Volume, volatility and price impact of a behavioral bias. Working paper. *National bureau of Economic Research*. DOI 10.3386/w9499
- Goossens, J. T., & Knoef, M. (2020). Preferences, disposition effect and COVID-19. *Academic Final Report*, 40.
- Goossens, J. T., & Knoef, M. (2022). COVID-19 Crisis: Do Extreme Events Affect Preferences and Trading Behavior?. Available at SSRN 4109220.
- Greenwald, A. G. (1980). The totalitarian ego fabrication and revision of personal history. *American Psychologist*, 35(7), 603–618
- Gupta, S. (2025). A Study on Behavioural Biases Influencing Investment Decisions Among Retail Investors in Bengaluru City. *The International Journal of Research and Scintific Innovation*, 12(3), 1914-1925.
- Jin, X., Li, H., Yu, B., & Zheng, Y. (2023). How does the COVID-19 pandemic change the disposition effect in fund investors?. *Pacific-Basin Finance Journal*, 81, 102119.

- Jin, X., Li, R., & Zhu, Y. (2021). Could social interaction reduce the disposition effect? Evidence from retail investors in a directed social trading network. *Plos one*, 16(2), e0246759.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 363-391.
- Kajol, M. K. (2020). *Factors affecting disposition effect in equity investment: a social network analysis approach* (Doctoral dissertation, Assam University).
- Kanojia, S., Singh, D., & Goswami, A. (2018). An empirical analysis of the factors influencing individual investors in the Indian Stock market. *Journal of Business and Management*, 20(3), 30-37.
- Kesuma, W., Ekaputra, I. A., & Chalid, D. A. (2022). Individual investor attention to stock split and the disposition effect. *Review of Behavioral Finance*, 14(5), 701-717.
- Kumar, J., & Prince, N. (2022). Overconfidence bias in the Indian stock market in diverse market situations: an empirical study. *International Journal of System Assurance Engineering and Management*, 13(6), 3031-3047.
- Kumar, M., Pandey, N., & Tripathi, A. P. (2025). Does the Bias Towards Under and Overconfidence Affect Investment Decisions?: Proof From India. In *Unveiling Investor Biases That Shape Market Dynamics* (pp. 87-122). IGI Global Scientific Publishing.
- Kuranchie-Pong, R., & Forson, J. A. (2022). Overconfidence bias and stock market volatility in Ghana: testing the rationality of investors in the Covid-19 era. *African Journal of Economic and Management Studies*, 13(1), 147-161.
- Leal, C. C., Loureiro, G., & Armada, M. J. R. (2018). Selling winners, buying losers: Mental decision rules of individual investors on their holdings. *European Financial Management*, 24(3), 362-386.
- Liu, B., & Tan, M. (2021). Overconfidence and forecast accuracy: An experimental investigation on the hard–easy effect. *Studies in Economics and Finance*, 38(3), 601-618.

- Locke, P. R., & Mann, S. C. (2015). Learning by aspiring professional traders: Learning to take risk. *Journal of Behavioral and Experimental Finance*, 8, 54-63.
- Malikov, G. (2019). Information, participation, and passive investing. *Participation, and Passive Investing (May 1, 2019)*.
- Menkhoff, L., Schmeling, M., & Schmidt, U. (2013). Overconfidence, experience, and professionalism: An experimental study. *Journal of economic behavior & organization*, 86, 92-101.
- Mishra, K. C., & Metilda, M. J. (2015). A study on the impact of investment experience, gender, and level of education on overconfidence and self-attribution bias. *IIMB Management Review*, 27(4), 228-239.
- Mushinada, V. N. C., & Veluri, V. S. S. (2018). Investors overconfidence behaviour at Bombay stock exchange. *International Journal of Managerial Finance*, 14(5), 613-632.
- Nair, P. S., & Shiva, A. (2024). Specifying and validating overconfidence bias among retail investors: A formative index. *Managerial Finance*, 50(5), 1017-1036.
- Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *The journal of finance*, 53(6), 1887-1934.
- Odean, T. (1999). Do investors trade too much?. *American economic review*, 89(5), 1279-1298.
- Oreng, M., Yoshinaga, C. E., & Eid, W. (2021). Disposition effect, demographics and risk taking. *RAUSP Management Journal*, 56(2), 217-233.
- Parhi, S. P., & Pal, M. K. (2022). Impact of overconfidence bias in stock trading approach: a study of high net worth individual (HNI) stock investors in India. *Benchmarking: An International Journal*, 29(3), 817-834.
- Park, J., Konana, P., Gu, B., Kumar, A., & Raghunathan, R. (2013). Information valuation and confirmation bias in virtual communities: Evidence from stock message boards. *Information Systems Research*, 24(4), 1050-1067.

- Prosad, J. M., Kapoor, S., Sengupta, J., & Roychoudhary, S. (2017). Overconfidence and disposition effect in Indian equity market: An empirical evidence. *Global Business Review*, 19(5), 1303-1321.
- Puetz, A., & Ruenzi, S. (2011). Overconfidence among professional investors: Evidence from mutual fund managers. *Journal of Business Finance & Accounting*, 38(5-6), 684-712.
- Qasim, M., Hussain, R., Mehboob, I., & Arshad, M. (2019). Impact of herding behavior and overconfidence bias on investors' decision-making in Pakistan. *Accounting*, 5(2), 81-90.
- Quispe-Torreblanca, E., Gathergood, J., Loewenstein, G., & Stewart, N. (2025). Investor logins and the disposition effect. *Management Science*, 71(1), 219-239.
- Rabbani, M. R., Azam, M. Q., Hawaldar, I. T., Aljalalma, R., & Dsouza, S. (2024). Does an overconfidence bias affect stock return, trading volume, and liquidity? Fresh insights from the G7 nations. *Cogent Economics & Finance*, 12(1), 2373266.
- Safeeda, K. A., & Ganesh, R. (2024). Unmasking the grey swan: Investor biases in times of turbulence. *Indian Journal of Finance*, 56-72.
- Sakaguchi, H., Stewart, N., & Walasek, L. (2019). The disposition effect varies with portfolio composition because people take gain-loss-domain-level sell decisions. *Available at SSRN 3053331*.
- Sapar, N. R. (2017). Empirical Study of Behavioral Biases in the Indian Stock Market.
- Scott, J., Stumpp, M., & Xu, P. (2003). Overconfidence bias in international stock prices. *Journal of Portfolio Management*, 29(2), 80-89.
- Seru, A., Shumway, T., & Stoffman, N. (2010). Learning by trading. *The Review of Financial Studies*, 23(2), 705-739.
- Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, 40(3), 777-790.

- Shrestha, N. R. (2019). Overconfidence and investment decisions in Nepalese stock market. *PYC Nepal Journal of Management*, 12(1), 27-36.
- Shrotryia, V. K., & Kalra, H. (2023). COVID-19 and overconfidence bias: the case of developed, emerging and frontier markets. *International Journal of Emerging Markets*, 18(3), 633-665.
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4(6), 592–604.
- Subedi, A., & Dangol, J. (2025). Information Framing and Disposition Effect on Nepalese Investors' Decision-making Behavior. *Nepalese Journal of Insurance and Social Security*, 8(2), 10-19.
- Tekçe, B., & Yılmaz, N. (2015). Are individual stock investors overconfident? Evidence from an emerging market. *Journal of Behavioral and Experimental Finance*, 5, 35-45.
- Torngren, G., & Montgomery, H. (2004). Worse than chance? Performance and confidence among professionals and laypeople in the stock market. *The Journal of Behavioral Finance*, 5(3), 148-153.
- Vagnani, G., & Mazzurco, F. (2022). Incidental Negative Life Events and the Disposition Effect at the Individual Level. *Journal of Finance and Investment Analysis*, 11(2), 1-21.
- Wajid, R. M. (2013). Portfolio Management and Disposition Effect Empirical Evidence From Pakistan.
- Weber, M., & Camerer, C. F. (1998). The disposition effect in securities trading: An experimental analysis. *Journal of Economic Behavior & Organization*, 33(2), 167-184.
- Zahera, S. A., & Bansal, R. (2019). A study of prominence for disposition effect: a systematic review. *Qualitative research in financial markets*, 11(1), 2-21.

Chapter 3

THEORITICAL FRAMEWORK

3.1	Introduction	39
3.2	Development of Behavioural Finance	41
3.3	Growth of Behavioural Finance	44
3.4	Behavioural Biases.....	46
	3.4.1 Cognitive Biases.....	46
	3.4.2 Frame Dependent/Emotional Biases	49
3.5	Overconfidence Bias (OCB)	51
3.6	The Disposition Effect (DE).....	52
3.7	White Swan, Grey Swan and Black Swan Phases.....	53
3.8	Market Capitalisation.....	54

3.1 Introduction

Before behavioural finance emerged as a recognised field of study, financial theory was largely built on the belief that markets were rational systems driven by logical, well-informed participants. For decades, economists and finance scholars assumed that investors acted systematically, processed information correctly, and made decisions that maximised their economic welfare. This was the era of standard/classical finance theories. They assumed investors were rational and markets were perfect. In financial contexts, this translated into the assumption that investors carefully evaluated risk and return, formed unbiased expectations, and acted in ways that optimised their portfolios. Emotions, cognitive limitations, social influence, and psychological biases were largely considered irrelevant or, at best, random disturbances that cancelled out at the aggregate level. As a result, early financial theories focused more on mathematical precision and equilibrium conditions than on the realities of human behaviour.

One of the most influential pillars of pre-behavioural finance was Expected Utility Theory, which provided a formal framework for decision-making under uncertainty. According to this theory, investors were assumed to choose among risky alternatives by comparing their expected utilities rather than their expected monetary outcomes. Risk preferences were treated as stable and internally consistent, allowing economists to model investor behaviour using well-defined utility functions.

Based on these assumptions, Modern Portfolio Theory (MPT), introduced by Harry Markowitz in the 1950s, represented a breakthrough in financial thinking. Markowitz demonstrated that investors could optimise their portfolios by considering not only individual asset returns but also the correlations among assets. MPT treated risk as variance, and portfolio diversification was a rational act of reducing portfolio risk

without compromising expected return; it also argued that markets reward rational decision-making.

During this period, another theory stemming from rationality was also formed calling Capital Asset Pricing Model (CAPM) by William F Sharpe in 1964. CAPM theory assumed that all investors possess homogeneous expectations and can borrow or lend freely through the rate of return that is free of risks. Therefore, asset prices were determined purely based on systematic risk. The theory was extensively used in the field of finance.

During 1960s and 1970s another theory got world wide attention developed by Eugene Fama the “Efficient Market Hypothesis (EMH)”. It argued that the market reflected all the available information in the pricing of financial assets. It was not possible for investors to ‘beat the market’ by skill, analysis, etc., since the market had already acted on the available information. It was assumed that the mispricing in the market is temporary, that it will correct by rational arbitrageurs. It provided no room for the irrational behaviour of investors. As per EMH the irrationality is a random one and will be reset by the rational investors. Hence market prices will always reflect the fundamental value. Regulatory policies and investment strategies were all made upon this belief reinforcing confidence in market self-correction.

Researchers observed persistent anomalies in financial markets that were difficult to reconcile with rational models. Patterns such as excess volatility, momentum, reversals, speculative bubbles, and market crashes always raised questions about whether prices truly reflected fundamentals. Traditional models failed to explain the extreme market fluctuations, herd behaviour, and events like stock market crash of 1987.

Still, these irregularities were considered as statistical noise or temporary fluctuations rather than questioning the underlying assumptions. They developed more sophisticated mathematical tools to explain these irregularities, but stuck to the rationality assumption.

Financial economists considered psychological aspects unscientific and subjective. Hence did not pay attention to human emotions such as fear, greed, regret and overconfidence in financial decision making. Even though there was evidence of routine, inconsistent, irrational behaviour, they believed that considering the psychological dimensions was irrelevant and inappropriate for rigorous financial modelling.

By the late twentieth century, scholars began to recognise that ignoring psychological factors resulted in an incomplete understanding of financial markets. These rigid assumptions regarding rationality, perfect information processing, and frictionless markets came to be increasingly viewed as unrealistic. This awareness paved the way for the development of Behavioural Finance, which aimed to integrate concepts related to psychology.

The transition from traditional finance to behavioural finance was not really a refutation of earlier theories but an evolution. Behavioural finance emerged to take care of the questions and anomalies that the classical models left behind. Hence, appreciation of the assumptions underlying, strengths, and weaknesses of the pre-behavioural era bears importance for understanding why behavioural finance became not just an alternative way of looking at things but a necessary extension of financial theory.

3.2 Development of Behavioural Finance

The story of the development of behavioural finance, in a sense, is the story of rediscovering the human within the economic model. While economics and eventually finance developed as theories built upon sophisticated mathematical constructs premised upon assumptions of rational investors, efficient markets, and markets reflecting all available information, these theories were incredibly successful. However, as time went on, imperfections and cracks within these theories became increasingly evident as real markets did not necessarily work as these theories suggested they should, as markets bubbled and eventually popped, and as people continued to behave irrationally.

Even during the height of rational finance, some scholars were uneasy. Observations from real markets suggested patterns that were difficult to reconcile with strict efficiency. Seasonal anomalies, excess volatility, and speculative bubbles hinted that something deeper was at work. In the 1970s, the groundwork for the study of behavioural finance started to emerge. However, not by finance scholars but by psychologists.

Daniel Kahneman

Interestingly, however, the groundbreaking work by Daniel Kahneman and his associate, Amos Tversky, was a major turning point in this field. They used a series of experiments to show that people make decisions under conditions of uncertainty by relying heavily on mental shortcuts, called heuristics. The three heuristics—representativeness, availability, and anchoring—result in biases rather than stochastic errors. Their Prospect Theory, developed by them in 1979, strongly contradicts the traditional utility theory. It was evident from their work that people make decisions relative to some reference point, exhibit loss aversion, and exhibit risk aversion as well as risk-seeking behaviour. Their Prospect Theory is an extremely realistic model for decisions, as will be seen from behavioural finance.

Richard Thaler

Richard Thaler played a crucial role in bringing psychological insights into economics and finance. Mental accounting, self-control, and fairness are some of the areas in which he showed that economic behaviour systematically deviates from rational benchmarks. Thaler's work with Kahneman and Tversky helped make the bridge between the disciplines of psychology and economics, legitimized what at one point was thought of as a very fringe movement. His later contributions, including the development of "nudge theory" with Cass Sunstein, expanded these behavioural insights into public policy and institutional design. In finance, in particular, researchers like Werner De Bondt and Richard Thaler documented overreaction in stock markets, with investors pushing prices too far in response to news. Their work on long-term reversals provided empirical evidence against the strictest versions of market efficiency.

Shefrin and Statman

Meir Statman, along with Hersh Shefrin, has made important contributions by formalizing the behavioural portfolio theory, including the existence of various investment biases such as the DE, which involves the tendency of investors to sell winning stocks too early or hold on to losing stocks for too long. Terrance Odean expanded on the issues of overconfidence in investors, who end up earning lower returns by engaging in more trading as a result of overconfidence in the information they possess.

Daniel, Hirshleifer, and Subrahmanyam

In their research conducted in 1998, Kent Daniel, David Hirshleifer, and Avanidhar Subrahmanyam created several formal models of asset prices with overconfidence and self-attributional biases. These models showed the implications of investor overconfidence in producing patterns like momentum effects and reversal effects.

It marked an important step in the development of behavioural finance, as formal theoretical models were emerging that could compete with the traditional frameworks of asset pricing. Behavioural finance was no longer purely descriptive; it was becoming mathematically and empirically testable.

Barber and Odean

Brad Barber and Terrance Odean presented powerful supporting scientific studies on overconfidence through their analysis of brokerage account information. The studies conducted in the late 1990s to early 2000s indicated that active investors who invested more received lower net returns. Gender differences in overconfidence were also identified by Barber and Odean. More aggressive trading was identified in male investors compared to female investors. Their research showed the impact of psychological biases on financial outcomes. This further increased the credibility of behavioural finance as an area of research with real-life implications by actually using real transaction data.

Robert Shiller

The 1990s and the early 2000s saw a consolidation of behavioural finance as a distinct field in its own right. The contributions made by Prof. Robert Shiller, particularly during the bubble of the dot-com era, through his study of the phenomenon of excess volatility and the existence of speculative bubbles in asset prices, have contributed to reinforcing the role of the impact of investor sentiment. Above all, the work of Robert Shiller underlined the role of narratives, social contagion, and the psychology of decision-makers in financial markets, and that these are not subject only to the determination of the effects of the cash flows. Even George Akerlof has been part of the development of the behavioural macro theory.

Andrew Lo

Andrew Lo has developed the Adaptive Market Hypothesis as a compromise between the conventional and the behavioural finance theories. Instead of completely negating market efficiency, the Adaptive Market Hypothesis states that the evolution of market efficiency is conditional on factors like market competition, learning, and the environment. The Adaptive Market Hypothesis marked an important milestone in the development of behavioural finance. It was a stage of integration with classical theory.

3.3 Growth of Behavioural Biases

As behavioural finance gained maturity, it branched off into various forms. One branch focused on individual investor behaviour, examining biases such as overconfidence, loss aversion, confirmation bias, herding, and framing effects. Another branch developed behavioural asset pricing models that attempted to integrate psychological factors into formal financial frameworks. A study was conducted to assess the efficiency of the limits to arbitrage for rational traders who were not entirely able to offset the anomalies caused by the biased investors. Experimental and neuroeconomic studies gained more popularity. Experiments using brain imaging were done to determine how emotions affect financial decisions. It reinforced the central role of fear, regret, pride and anxiety in financial decision making.

However, in emerging markets, behavioural finance acquired special relevance. For investors, market participants confront more uncertainty, informational asymmetry, and structural inefficiencies. Notably, studies verified that overconfidence and the DE were not limited to only emerging markets but found expression in all kinds of markets. In this way, behavioural finance became enriched by its global scope and highlighted the cultural, demographic, and experiential variances of investors.

Over time, behavioural finance also influenced regulatory thinking. The realization grew on the part of policymakers that the provision of inputs alone may not be enough to produce rational action. Disclosure rules, default options in retirement savings, and investor protection schemes now increasingly take behavioural contributions on board. The concept that markets reflect the role of human weaknesses rather than the principle of rational optimization has pervasively influenced both academic discourse and policy.

It is evident, notwithstanding the progress of the subject, that Behavioural Finance has not replaced the traditional view of Finance but has added dimensions to it. Most theorists today are taking a measured approach, acknowledging the efficiency of the markets in general but also agreeing to the presence of systematic patterns of behaviour.

Behavioural finance today is an established and evolving body of thought. It has progressed from being a counterargument to the classical theory to becoming an integral part of mainstream financial studies. The emergence of behavioural finance is the result of a fundamental change in the way we think. This is captured by the following statement: "Not equations, not equilibrium conditions, but people underlie the functioning of the economy."

The growth of behavioural finance forces us to recall that finance is ultimately a study of human judgement under uncertainty. Markets are not abstract machines but human spaces where confidence, fear, hope, and regret are continuously at work. In so far as it does so, behavioural finance has restored realism to finance. It has greatly expanded the explanation of the causes of market deviations from fundamentals, the reasons why investor decisions contain so many predictable errors, and the ways in which we

might mitigate the impact of these errors. The following session of this chapter discusses various behavioural biases.

3.4 Behavioural Biases

Financial decision-making has traditionally been understood through the lens of rationality, wherein financial investors were thought to analyse data objectively and act in ways that produced an outcome with the highest utility, or expected utility. However, over the years, anomalies in financial markets eventually led to an understanding of how investors do not strictly adhere to rational standards of financial decision-making. These non-rational approaches, far from being random, reveal discernible patterns of human thinking.

Behavioural biases refer to consistent and predictable deviations from rational judgement that arise when individuals process information and make decisions under uncertainty. In financial markets, such biases influence how investors perceive risk, interpret information, react to gains and losses, and adjust their portfolios. These biases operate at both individual and aggregate levels, shaping trading behaviour, asset pricing, and market volatility. Nonetheless, over the course of time, attempts have been made to categorize these types of biases to gain a deeper understanding of these types of behaviours. The most widely used categorization of behavioural biases falls under cognitive as well as emotional types of bias; however, other categorizations include heuristic-driven, self-deception, and social bias types.

3.4.1 Cognitive Biases

Cognitive biases have been found to stem from limitations in human thought processing. They have, however, been associated mainly with mental short-cuts or heuristics, which people use as an alternative in the processing of complex decision situations. Even though the use of heuristics can prove useful in one's daily activities, it always results in a systematic error in the case of financial decisions. Given below are the major cognitive biases identified by various scholars.

Table 3.1*Cognitive Biases*

Bias	Description
Overconfidence Bias	Overestimation of the accuracy of their knowledge, underestimation of risk, and overestimation of their ability to predict the market often lead to overtrading.
Self-Attribution Bias	Attribution of successful outcomes to their own skill and unsuccessful outcomes to external events, which reinforces overconfidence.
Confirmation Bias	Tendency to seek, interpret, and remember information that confirms prior beliefs while ignoring information that contradicts these beliefs.
Hindsight Bias	After outcomes have occurred, investors feel they “knew it all along,” which distorts learning from past experiences.
Representativeness Bias	Estimation of probabilities based on stereotypes or recent experience rather than statistical analysis.
Anchoring Bias	Heavy dependence on initial reference points (e.g., purchase price) in decision-making.
Availability Bias	Decisions are driven by information that is easily remembered or most recent rather than objective probability.
Conservatism Bias	Slow updating of beliefs when new information is presented.
Illusion of Control	Belief in one’s ability to control or influence outcomes that are largely random.
Optimism Bias	Systematic overestimation of positive outcomes.
Belief Perseverance	Persistence of initial beliefs despite disconfirming evidence.
Cognitive Dissonance	Psychological discomfort from conflicting beliefs, which leads to biased justification.
Recency Bias	Overweighting of recent information in decision-making.
Gambler’s Fallacy	Expectation that random events will correct themselves in the short run.
Hot-Hand Fallacy	Expectation that success leads to continued success.
Escalation of Commitment	Increased commitment to unsuccessful investments because of previous commitment.

Bias	Description
Sunk Cost Fallacy	Continuing an investment because of a previous commitment of resources.
Overreaction Bias	Overreaction to new information.
Underreaction Bias	Slow response to new information.
Selective Perception	Trying to interpret information to support preconceived notions.
Attribution Bias	Attributing outcomes to personal characteristics rather than situational factors.
Survivorship Bias	Looking only at successful firms or winners and not at losers.
Authority Bias	Giving too much weight to the opinions of self-proclaimed experts.
Outcome Bias	Evaluating decision quality based on outcome rather than process.
Salience Bias	Giving too much weight to vivid information.
Information Cascade	Disregarding private information and following others' actions.

Heuristic-Driven Biases

Heuristic-driven biases occur when individuals utilize mental judgments or “rule of thumbs” to choose in uncertain states. This idea of heuristics was first introduced by Kahneman and Tversky (1974). They proved both the usefulness and fallibility of this simplified approach to handling numerous situations. In the world of finance, investors are often required to analyze numerous types of information within a given period. Rather than utilizing intricate judgment to invest, simplified judgment must be employed. While it can save time, it can also manipulate judgment, probability, and risk assessment.

Heuristic-driven biases are different from the emotional biases described above in that they are driven by cognitive rather than emotional factors. These types of biases result from the brain's attempt to conserve resources by acting on patterns, past experiences, or information that is easily accessible to the person. While the use of heuristics may result in rational decisions on some occasions, they often result in mispricing,

excessive trading, underreaction, overreaction, and misperceptions of risk in the context of finance. These are a subset of cognitive biases, and includes representativeness bias, anchoring bias, overconfidence bias and anchoring bias.

3.4 Frame Dependent/Emotional Biases

Emotional biases are the kinds of decision-making tendencies that come from the heart rather than the head. They arise when feelings such as fear, excitement, regret, pride, or anxiety quietly take control of our choices, especially in situations involving risk and uncertainty. In financial markets, investors are not cold calculators; they are human beings who experience disappointment when prices fall and excitement when markets rise. The emotional side of investing is discussed under frame-dependent bias. For example, the pain associated with losing money tends to be much stronger than the joy of gaining the same amount, which can hold investors back from selling stocks in a losing position longer than appropriate. Sometimes market booms create optimism and excitement among investors, which leads to taking higher risks that they would have avoided otherwise.

What makes emotional biases peculiar is that they are deeply personal and usually hard to correct. Unlike the simple reasoning biases, which, on occasion, may be corrected simply by better information, emotional biases are allied with self-image, comfort, and psychological protection. Investors may refrain from selling a bad investment not because they don't know any better but because admitting a mistake is uncomfortable. In times of stress, such as during a financial crisis, when fear and uncertainty are leading, emotional biases become even more dominant. In this sense, emotional biases remind us that financial behaviour cannot be purely analytical; it is shaped by feelings and experiences and the natural wish of any human being to avoid pain and seek reassurance.

Table 3.2*Emotional Biases*

Bias	Description
Loss Aversion	Losses are more painful than equivalent gains are pleasurable.
Disposition Effect	Selling winning stocks too early and holding losing stocks too long.
Regret Aversion	Avoiding decisions that might lead to future regret.
Mental Accounting	Categorizing money into separate accounts influences rational assessment.
Endowment Effect	Overvaluing assets simply because one owns them.
Status Quo Bias	Preference for maintaining current positions.
Framing Effect	Decisions differ based on how choices are framed.
Herd Behaviour	Following others' actions despite personal beliefs.
Familiarity Bias	Preference for known investments
Home Bias	Overinvestment in domestic securities.
Affect Heuristic	Emotional responses affect risk perception.
Ambiguity Aversion	Preference for known risks over unknown probabilities.
Narrow Framing	Evaluating investments in isolation rather than as a portfolio.
Money Illusion	Confusion between nominal and real values.
Prospect Theory Effect	Risk aversion in gains and risk seeking in losses.
Bandwagon Effect	Following a popular belief or action rather than one's own interest or need due to fear of missing out.
Contrast Effect	Judging choices relative to alternatives rather than absolute value.
Time-Inconsistency	Changing preferences over time inconsistently.
Hyperbolic Discounting	Preferring smaller immediate rewards over larger future gains.
Present Bias	Overvaluing immediate outcomes over future benefits.
Self-Control Bias	Failure to act in long-term interest.
Emotional Gap Bias	Underestimating the influence of emotional states on decisions.
Escalation Due to Ego	Continuing investment to protect self-image.

Bias	Description
Risk-Seeking in Losses	Increased risk-taking when facing losses.
Risk Aversion in Gains	Conservative behaviour when in profit.
Regret-Based Holding	Holding losing assets to avoid emotional discomfort.

This paper discusses cognitive bias, overconfidence, and the emotional bias, known as the disposition effect. The following sections provide a detailed discussion of them.

3.5 Overconfidence Bias (OCB)

Overconfidence can be defined as the presence of an exaggerated belief in one's reasoning, judgment, and ability. The root of overconfidence lies in studies demonstrating that people tend to overestimate both the validity of the information they possess and the validity of the predictions they can make. In general, people tend to overestimate their intelligence and competence.

Studies in finance have consistently found that self-proclaimed stock market experts are overconfident in their decision-making. One manifestation of this problem is prediction overconfidence, whereby they place unusually tight bounds on their prediction intervals. Thus, when they try to predict the future price of a stock, they may predict only a 10 per cent change, whereas in fact stock prices have fluctuated much more in the past.

Another form is certainty overconfidence, which occurs when investors become overly confident in their judgments. Once they decide a company is a "good investment," they often ignore the possibility of losses and are caught off guard if the stock performs poorly. This mindset feeds the search for the "next hot stock" and leads to overtrading at the expense of diversified portfolios. In both cases, overconfidence distorts rational decision-making and exposes investors to risks they fail to recognize.

Implications for Investors

Overconfident investors tend to think their skills at judging the company's investment potential are exceptional. This will lead them to ignore negative news that would have steered them away from trading or investment. They believe they have exclusive

knowledge that no one else has, and thus trade more often, which results in lower investment performance. Due to their past success, they underestimate the risk of loss when the markets are not in their favour. Hence, their average return is lower. Portfolios managed while overconfident are often under-diversified. This puts investors at increased risk, and their risk tolerance does not adjust evenly as expected. Actually, they are not even aware that they might be taking more risks than they can typically handle.

3.6 The Disposition Effect (DE)

Prospect theory, which emerged in 1979 through the work of Kahneman and Tversky, treats loss aversion as one of its tenets and finds that individuals fear losses more than they value equivalent gains, approximately twice as much. This indicates that, as an investor, they will require at least twice the value of gains relative to the pain of losses.

The value function in prospect theory represents the S-curve having a kink at the point of the reference level, which has a higher slope on the loss side, leading to risk seeking in the presence of losses (to avoid the last point in a sequence being a loss) and risk aversion in the presence of outcomes (to secure the gain). This phenomenon is referred to by practitioners as "get-even-itis," in which losses persist when there is little hope of a comeback and compound elsewhere.

These interactions directly spur the DE, as modelled by Shefrin–Statman, in which losses persist, and gains recede. These behaviours cause a deterioration in portfolio efficiency, and underperforming portfolios will outperform appropriate benchmarks with inappropriate holding times—prolonging drawdowns and ending booms.

Implication for Investors

Individuals with the DE may sell their winning investments prematurely because they fear losing their gains, thereby hindering the expansion of their investment portfolios. Investors who do not want to sell a set of losing investments may create poor investments that appear better in investment portfolios, contrary to their initial investment strategy and performance. Investors' reluctance to sell their worst-performing investments exposes them and prevents them from improving their

investment performance. This indicates that they forgo income or better investment opportunities in order to reap benefits.

3.7 White Swan, Grey Swan and Black Swan Phases

Both routine changes and significant events that impact investor behaviour and risk perception influence financial markets. The Black Swan Theory, proposed by Nassim Nicholas Taleb in 2007, provides a useful paradigm for understanding the dynamics of probability and predictability in economic events. Taleb argued that rare, unpredictable events, termed “black swans,” have too much power and too often lie beyond the boundaries of traditional risk models. Using this metaphor, researchers and professionals have also discussed "grey swans" and "white swans," which denote events with different levels of predictability and impact. These classifications help us understand how investor biases, such as overconfidence and the DE, manifest across different market periods.

Black Swan Events

Three things set black swan events apart: they are very rare, they have huge effects, and they can only be explained after the fact.

- The global financial crisis of 2008, which was triggered by the collapse of mortgage-backed securities, was an unexpected event that altered the manner in which banks and regulators operate globally.
- The COVID-19 pandemic disrupted supply chains, altered consumer behaviour, and led to investors seeking safer sectors such as technology and biotech.
- How Investors Behave: The psychological biases of investors are amplified during black swan events. Investors make decisions based on panic selling, herd behaviour, and a strong fear of risk.

Grey Swan Events

Grey swans are somewhere between being predictable and being surprising. They are unusual but possible events that are unlikely to happen, but not impossible to imagine.

When you examine the systemic vulnerabilities, you can actually spot the grey swans coming as opposed to the black swans.

- Trade tensions between large economies, such as the U.S. and China, are grey swans. They are expected to occur, but won't have a catastrophic effect.
- Tax or capital changes that occur suddenly may disturb the markets, but won't bring them down.

White Swans Events

White swans stand for things that happen predictably and follow set patterns. They are quite likely to happen and are often expected by markets. They are predictable from our historical experiences.

- Seasonal patterns in retail sales, like the busiest times for holiday buying.
- Planned policy pronouncements, such as decisions about interest rates by the central bank.
- Expected reports on how much money companies made.

3.8 Market Capitalisation

Market capitalization is calculated by multiplying the current share price by the total number of outstanding shares. This number not only shows how much the market thinks a firm is worth, but it also plays a big role in how portfolios are built, how risks are assessed, and how investors act. There are three main types of equities based on their market capitalization: large-cap, mid-cap, and small-cap. Each category has its own traits when it comes to stability, growth potential, risk exposure, and how appealing it is to investors.

Large-Cap Stocks

Large caps are stocks with a market capitalization above ₹20000 crore and are generally ranked among the top 100 companies in an index. Blue-chip stocks come in this group. They are well-established, large-sized companies that can even influence

the economy. They are often the best in their field, have a good reputation, do business all over the world, and make a lot of money.

- They are more stable and less volatile than smaller companies.
- Easier access to capital markets and a wider range of ways to make money.
- A lot of engagement from institutional investors.
- Examples: This group includes big companies like TCS, Adani Ports, Reliance, etc

Mid-cap Stocks

Medium-capitalization stocks are companies with a market capitalization between ₹5000 crore and ₹20000 crore. They are companies in the growth stage that are highly affected by market volatility. Typically, they are ranked 101st to 250th in the stock market. They frequently reflect companies that are growing, gaining market share, or becoming leaders in their field.

- More flexible than big companies but more stable than small caps.
- They are less volatile and more likely to expand than huge caps
- Investors who want a good balance between risk and profit may find it appealing. Vodafone Idea Ltd., Indian Bank etc. are examples.
- This group includes companies in industries including manufacturing, technological services, and regional banking.

Small Cap Stocks

Stocks with a market capitalization of less than ₹5000 crores are classified as small-cap stocks. They are ranked above 250 in the stock market. They are more vulnerable than large and medium stocks.

- Very volatile and affected by changes in the market.

- Harder to get money and fewer products or services to choose from.
- More likely to be hurt by economic shocks.
- Small-cap stocks are more likely to be bought by retail investors, who are often overconfident and looking for a quick profit.

The three groups of market capitalization have different risk-return profiles:

- Large-cap stocks are stable and can last for a long time.
- Mid-caps offer chances for growth while keeping risk in check.
- Small-cap stocks can grow quickly, but you need to be careful with the risks, and they are less liquid.

From a behavioural finance perspective, biases manifest in distinct ways across these categories. OCB is more prevalent in small-cap investments, whereas the DE is more prevalent in mid-cap assets. Although large-cap stocks are often efficient, they can still exhibit herd behaviour during times of crisis.

Market capitalization is not merely a measure of a firm's size; it also influences how investors behave and how their portfolios evolve. Investors and academics can better understand behavioural biases across market segments by distinguishing among large-cap, mid-cap, and small-cap stocks. The classification of stocks by capitalization provides an essential foundation for examining variations in OCB and the DE across different market structures, particularly during periods of heightened uncertainty, such as the COVID-19 pandemic.

Chapter 4

RESEARCH METHODOLOGY

4.1	Introduction	57
4.2	Research design and methodology.....	57
4.3	Source of data	57
4.4	Period of the Study	58
4.5	Sample size determination.....	58
4.6	Sampling Method.....	58
4.7	Tools for data collection.....	59
4.8	Data processing and Analysis	59
4.9	Pre-test for Questionnaire	59
4.10	Reliability and Validity	59
4.11	Market Vector Autoregression (M-VAR)	61
4.12	Security Vector Autoregression	63
4.13	Structural VAR (SVAR)	65
4.14	ANOVA	66
4.15	Independent sample t-test.....	66

4.1 Introduction

This section outlines the design and methodology used to carry out the research. It includes the sampling procedure, data processing software, and analysis tools and techniques.

4.2 Research design and methodology

This analytical research rigorously scrutinises, interprets, and assesses the current state of the Indian stock market to elucidate causal links and provide profound insights. This research aims to elucidate the multifaceted aspects of overconfidence bias (OCB) and the disposition effect (DE), as well as their prevalence in the Indian stock market.

4.3 Source of data

Both primary and secondary data were used for the study. Primary data were collected from the investors in the Indian equity market. Secondary data were downloaded from the official website of the National Stock Exchange (NSE), www.nseindia.com. Daily trading data of the Nifty 500 index and its constituent stocks were used for the study.

The Peculiarities of the Nifty 500 Index

The Nifty 500 is the most extensive index of the NSE, consisting of 500 firms from several sectors. It represents approximately 92.29% of the free float market capitalisation of the stocks listed on the NSE as of March 28, 2025. It provides a comprehensive picture of the market, encompassing small-cap, mid-cap, and large-cap equities, hence facilitating the analysis of market-wide influences and systematic risk. Its diversity across cyclical industries, defensive sectors, and emerging enterprises underscores its significance in analysing the dynamics of the Indian stock market.

4.4 Period of the Study

Data for the Nifty 500 study index were obtained from the official NSE website, covering the period from April 1, 2014, to March 31, 2022. The entire period was divided into three phases to analyse the impact of COVID-19 on the Indian stock market. The period from April 1, 2014, to December 31, 2019, is considered the white swan phase. The initial case of COVID-19 was reported in India in January 2020, marking the commencement of the pandemic period for the study on January 1st, 2020. The National Disaster Management Authority (NDMA) opted not to invoke Covid-19 provisions on March 31, 2022, indicating the country's return to stability; thus, the pandemic period for the study concludes on this date (Two years on, 2022). Therefore, the grey swan period is 1st January 2020 to 31st December 2022. This study examined the presence of OCB exclusively in 2020, a period characterised by lockdowns and public hysteria, known as the black swan phase. This partition facilitates the comparison of stable and volatile markets in the Indian stock market.

4.5 Sample size determination

The sample size was calculated using a power analysis in RStudio, and 1130 samples were found sufficient for the study.

4.6 Sampling Method

The primary data were gathered utilising the self-selection sampling method, allowing respondents to engage willingly based on their interest in the study. The absence of a comprehensive, publicly accessible database with complete information on individual investors or traders precludes the possibility of conducting random sampling. Conducting random sampling is challenging without knowledge of the total population size or a comprehensive list of potential participants. Prior literature has employed convenience sampling due to these limitations. Convenience sampling prioritises the ease of data collection for the researcher, perhaps leading to a distorted understanding of respondents' true perceptions, particularly with sensitive issues such as biases in decision-making. Therefore, the study employed self-selection sampling

to guarantee accurate and genuine responses from participants, hence minimising non-response error and enhancing respondent commitment (Khan, 2024).

4.7 Tools for data collection

The questionnaire was meticulously designed to gather demographic information from respondents and their investment behaviour, and included five Likert-scale statements each to assess OCB, the DE, and overreaction to private information. It was designed based on feedback from subject-matter experts, share brokers, experienced investors, and a statistician.

4.8 Data processing and Analysis

Data tabulation and cleaning were conducted in Microsoft Excel, primary data analysis in Jamovi 2.4.14, and time series analysis in EViews 10.

4.9 Pre-test for Questionnaire

A pre-test was conducted using 50 questionnaires to identify potential problems in data collection procedures, refine the questionnaire, and estimate the time and resources required for data collection. Analyses were performed to ensure the validity and reliability of the data and to assess its suitability for further analysis

4.10 Reliability and Validity

This preliminary study assessed the feasibility, face validity, content validity, reliability, and normality of the data, ensuring that the instrument met the research demands. Following this validation process, full-scale data collection was done.

Reliability

To ensure the integrity of the analysis, the reliability of the collected data was first evaluated using Cronbach's alpha, which yielded a value of 0.779, confirming its adequacy for further statistical analysis (Hair et al., 2006).

Convergent validity

Convergent validity was assessed through Principal Component Analysis (PCA). The analysis extracted four components, each with an eigenvalue greater than 1 (Kaiser, 1960), accounting for a total variance of 57.38%, which surpasses the recommended threshold of 50% (Hair et al, 2010). Additionally, the factor loadings of retained items were examined, with the majority exceeding 0.5, signifying strong convergent validity.

Face Validity

Furthermore, face validity was ensured through a panel of experts, including subject specialists and industry practitioners, who rigorously reviewed the questionnaire to validate its appropriateness and relevance for the study.

Sampling adequacy

Since the actual sample size is greater than the sample size suggested by the power analysis for carrying out the analysis to minimise Type I and Type II errors, its adequacy is assured. Further, the KMO value of 0.803 indicated that the dataset has a high degree of sampling adequacy, meaning the variables show sufficient correlations to be considered for underlying factor structures. According to Kaiser's classification, this falls in the "*meritorious*" range, suggesting that the questionnaire items are well-suited for measuring related constructs (Kaiser, 1974).

R² and Adjusted R²

The coefficient of determination quantifies the proportion of the endogenous variable's variance explained by the exogenous variables. The adjusted R² modifies the R² by penalizing the inclusion of non-significant predictors. So, these measures were used to ensure the model's fitness in VAR models.

Durbin-Watson

Checking autocorrelation is essential to ensure the reliability of test results; the Durbin-Watson test was done in VAR models.

Models

4.11 Market Vector Autoregression (M-VAR)

H0a: The Indian equity market is not affected by OCB

This analytical study employed the VAR model to assess overconfidence in the equities market. This model presents a framework for examining the relationship among market trading volume, lagged market returns, lagged trading volume, and idiosyncratic volatility (Statman et al, 2006). Equation (4.1) calculates the market return, whereas Equation (4.2) computes idiosyncratic volatility.

$$Return = \ln(current\ closing\ price/previous\ closing\ price) \dots\dots\dots (4.1)$$

Parkinson's model (1980) is applied to calculate the idiosyncratic volatility.

$$Volatility = \sqrt{250} * \sqrt{\frac{1}{4 * \ln(2)} * \ln\left(\frac{h}{l}\right)^2} \dots\dots\dots (4.2)$$

h - the highest price in a day

l - the lowest price in a day.

Stationarity is essential for every regression model utilised on time-ordered data. Unit roots are detected utilising the ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) tests. The data is considered stationary if a unit root is absent, allowing for the use of regression models. Upon the removal of the unit root from the time series data, the analysis may advance with VAR.

Employing VAR on aggregate transaction volume and market returns reveals investors' overconfidence. Daily volatility, lagged market return, and lagged market turnover are independent variables, but the logarithmic turnover value and daily market return of the Nifty500 are dependent variables.

$$LogT_t = \alpha + \sum_{j=1}^k \beta_j LogT_{t-1} + \sum_{j=1}^k \gamma_j LogRm_{t-1} + v LogVol_t + \varepsilon_{1t} \dots\dots\dots (4.3)$$

$$LogRm_t = \alpha' + \sum_{j=1}^k \beta'_j LogT_{t-1} + \sum_{j=1}^k \gamma'_j LogRm_{t-1} + v' LogVol_t + \varepsilon_{2t} \dots\dots\dots (4.4)$$

LogT: the natural log of the turnover of the index, *Log Rm*: the logarithmic value of daily index return, *Log Vol*: the idiosyncratic volatility of the index, *k*: the length of lags, *j*: lag summation index, *t*: the number of observations and ε : the residual disturbances.

The determination of the lag length (*k*) is conducted using both the AIC (Akaike Information Criterion) and the SIC (Schwarz Information Criterion). The regression values β and γ are utilized to analyse the variations in dependent and independent factors over time. The occurrence of overconfidence in the Indian stock market is indicated by a positive correlation between the volume of the Nifty 500 index and the lags of the index return. In other words, positive and significant values of γ indicate the presence of OCB. Subsequently, the impulse response function is employed to investigate the degree of bias present in the market. The Impulse Response Function (IRF) is a part of Vector Autoregression (VAR) models that looks at how a shock (or impulse) to one variable affects other variables over time.

H0_b: The presence of OCB does not vary between different phases.

India faced an unparalleled challenge due to COVID-19. Due to the country's size, its precarious economic status in the financial sector, and its reliance on an unregulated workforce, the economy was highly disrupted. Lockdowns and various forms of social isolation have proven to be significantly disruptive (Dev & Sengupta, 2020). A VAR model and IRF analysis were utilised to investigate the impact of OCB across different time intervals, namely white swan, grey swan and black swan phases. AIC and SIC were employed to determine the lag duration for executing VAR.

H0_c: The magnitude of OCB is the same in the large-cap index, the mid-cap index and the small-cap index.

This study examines the prevalence of OCB across market capitalisation segments, utilising the Nifty 500 index constituents as of April 1, 2014. Daily trading data at the stock level were sourced from the National Stock Exchange (NSE) website, covering the period from April 1, 2014, to March 31, 2022.

Stocks traded throughout the study period, that is, from 1st April, 2014, to 31st March, 2022, were included to ensure the consistency and reliability of the results. The final sample comprised 163 large-cap, 140 mid-cap, and 138 small-cap stocks, classified according to the NSE's market capitalisation criteria.

To enable a thorough examination, three indices were constructed for large-cap, mid-cap, and small-cap stocks with the following variables: daily average market return, daily average trading volume, and daily average volatility of the member stocks within each market capitalisation segment. The indices served as the fundamental variables for assessing the prevalence and variations of OCB.

To assess variations in investor behaviour over time, the study period was divided into the following distinct phases: White swan phase, grey swan phase and black swan phase.

Examining behavioural signals categorised by market capitalisation and various sub-periods aims to identify patterns that may reveal OCB across different market conditions.

Market vector autoregression and IRFs were applied to daily trading data for constructed large-cap, mid-cap and small-cap indices to identify the OCB.

4.12 Security Vector Autoregression

H0_a: The Indian stock market is not affected by the DE

After conducting the ADF and PP tests to ensure the stationarity of the variables used in the study, the Security vector autoregression (S-VAR) is used to test the DE hypothesis at the security level. It is applied to investigate and segregate the impact of DE and overconfidence. For an investor affected by the DE, an increase in the return of a particular stock will influence him to trade that particular stock and avoid trading in other stocks at that point in time. This increases transaction volume for an individual stock. By estimating the relationship between a stock's return and its trading volume, we can measure the bias effect, captured by applying a security-wide VAR.

$$\text{Log}T_t = \alpha + \sum_{j=1}^k \beta_j \text{Log}T_{t-1} + \sum_{j=1}^k \gamma_j \text{Log}Ri_{t-1} + \sum_{j=1}^k \lambda_j \text{Log}Rm_{t-1} + v \text{Log}Vol_t + \varepsilon_{1t}$$

..... (4.5)

$$\text{Log}Ri_t = \alpha' + \sum_{j=1}^k \beta'_j \text{Log}T_{t-1} + \sum_{j=1}^k \gamma'_j \text{Log}Rt_{t-1} + \sum_{j=1}^k \lambda'_j \text{Log}Rm_{t-1} + v' \text{Log}Vol_t + \varepsilon_{2t}$$

..... (4.6)

$$\text{Log}Rm_t = \alpha'' + \sum_{j=1}^k \beta''_j \text{Log}T_{t-1} + \sum_{j=1}^k \gamma''_j \text{Log}Rt_{t-1} + \sum_{j=1}^k \lambda''_j \text{Log}Rm_{t-1} + v'' \text{Log}Vol_t + \varepsilon_{3t}$$

..... (4.7)

Log T is the log value of the volume traded of each security *i*,

Log Rm is the daily market return,

Log Ri is the daily return of security *i*,

Log Ivol is the idiosyncratic volatility of firm *i* on day *t* (standard deviation of the regression residual between stock return and market return), and

k is the number of lags.

Positive and significant values of security return lags (*Ri*) indicate the DE and Positive and significant values of market return lags (*Rm*) indicate OCB. Further, IRFs are plotted to examine the impact of a shock to one endogenous variable on the other. IRFs determine the impact of a residual shock (± 1 standard deviation from the origin) and the time it takes to be fully absorbed by the process.

H0e: The presence of DE does not vary across different swan phases.

To test this hypothesis, an S-VAR was run for all stocks in the large-cap, mid -cap and small-cap stocks by dividing the data period into white swan, grey swan and black swan phases. Further IRF analyses were conducted to trace the effect and duration of the bias.

H0f: The effect of OCB and DE is the same during all phases in all market capitalisation stocks.

This study investigates the presence of OCB and the DE among large-cap, mid-cap, and small-cap stocks within the Nifty 500 index. The analysis was conducted using Security Vector Autoregression (VAR) over three distinct market phases: White Swan, Grey Swan, and Black Swan, representing varying levels of market volatility and uncertainty. The dataset includes 441 stocks for which continuous daily trading data spanning eight years was available.

The Security VAR model and Impulse Response Functions (IRF) were run independently for each stock. OCB was identified by examining positive, statistically significant lagged market returns, while the DE was identified by examining positive, statistically significant lagged stock (security) returns. When the coefficients were positive, IRFs for trading volume responses to both market and individual stock returns were analysed to assess the intensity and duration of each bias in each stock.

Subsequently, the number of stocks exhibiting OCB, DE, both biases simultaneously, or neither bias was quantified. The intensity and duration of these biases were compared across the three market phases and across stock categories based on market capitalization. This comparison aimed to understand how varying degrees of volatility and uncertainty affected investor behaviour and the manifestation of these biases in the Indian equity market.

4.13 Structural VAR (SVAR)

H_{0d}: There is no significant difference in Investors' reaction to private and public information.

Investors' differential reaction to private and public information has been studied by many researchers. They found that excessive trading volume is primarily because overconfident investors overweight their private information and underweight public information (e.g., Odean, 1998a; DHS, 2005). Campbell et al. (1993) argue that if public information that affects all investors arrives, stock market trading volume may not be significantly affected. To empirically evaluate how investors in the Indian stock market react to private and public information, a structural VAR (Vector Autoregression) model is applied as suggested by Chuang and Lee (2006).

$$LogT_t = \alpha + \sum_{j=1}^k \beta_j LogT_{t-1} + \sum_{j=1}^k \gamma_j LogRm_{t-1} + \varepsilon_t^{private} \dots\dots\dots (4.8)$$

$$LogRm_t = \alpha' + \sum_{j=1}^k \beta'_j LogT_{t-1} + \sum_{j=1}^k \gamma'_j LogRm_{t-1} + \varepsilon_t^{public} \dots\dots\dots (4.9)$$

$LogT$ is the log value of the trading volume of market index.

$LogRm$ is the log value of daily market return.

$\varepsilon_t^{private}$ is the private information shock

ε_t^{public} is the public information shock.

As formal overconfidence theories do not specify a time frame for the relationship between returns and trading volume, we apply AIC and SIC to determine the number of lags (k).

This model implies that trading volume and stock returns are driven by two types of shocks: private and public information shocks. The two types of information shocks are distinguished by an identifying restriction. That is, private information shock $\varepsilon_t^{private}$ has a contemporaneous impact on trading volume, while public information shock ε_t^{public} has no contemporaneous impact on trading volume.

Once a restricted BVAR (Bivariate vector autoregression) model of trading volume and stock return is estimated, we derive a restricted BVAR model of trading volume and stock price, to know how stock market prices react to private and public information shocks. After that we can analyse the hypothesis. For testing this hypothesis impulse responses of returns to one standard deviation of private and public information shocks on turnover and trading volume will be carried.

4.14 ANOVA

One-way ANOVA was carried out to compare the OCB and DE among gender groups.

4.15 Independent sample t-test

An independent-sample t-test was conducted to compare the OCB and DE among retail investors and financial advisors, and to compare their levels of satisfaction with investments.

Chapter 5

**OVERCONFIDENCE
BIAS IN THE INDIAN STOCK
MARKET (OCB)**

5.1	Overconfidence Bias in the Indian Stock Market	67
5.2	OCB During Different Swan Phases	71
5.2.1	Overconfidence Bias During the White Swan Phase	73
5.2.2	Overconfidence bias during The Grey swan phase	75
5.2.3	Overconfidence Bias During Black Swan Phase	77
5.3	Relation Between Volatility, Market Return and Volume	79
5.4	Conclusion	80
	References	83

5.1 Overconfidence Bias in the Indian Stock Market

Objective 1: To assess the extent and impact of OCB in the Indian stock market over white swan, grey swan and black swan phases.

Hypothesis

H0_a: The Indian equity market is not affected by overconfidence bias.

This section presents the analytical findings of our investigation of the presumptive behaviour of investors in the capital market and its impact on trading behaviour. We examine the descriptive statistics of the selected variables, followed by an analysis of each hypothesis.

Table 5.1

Descriptive Statistics

Variables	Average	S.D.	S. E	Max.	Min
Log Volume	20.92	0.506	0.011	22.41	18.64
Log Market Return	0.000	0.010	0.000	0.040	-0.137
Volatility	1.37	0.406	0.009	5.47	0.457

Source: Data Computed by the researcher

The descriptive statistics of the variables presented in Table 5.1 offer significant insights into market dynamics. The log volume demonstrates a substantial average of 20.92, signifying steady trading activity, accompanied by a moderate standard deviation of 0.506, showing some fluctuation in trade size. The log market returns exhibit a mean value of 0.000, indicating a stable trend in returns over time. Notwithstanding a modest standard deviation of 0.010, the outliers (0.040 and -0.137) indicate sporadic significant fluctuations in price changes. Volatility, averaging 1.37

with a standard deviation of 0.406, indicates diverse market uncertainty, spanning from 0.457 to 5.47.

These findings emphasize the consistency of trade volume while accentuating the unpredictability of returns and volatility. Infrequent extreme log market returns indicate market sensitivity, as substantial deviations may arise under specific situations. The volatility levels confirm this observation, indicating intervals of market stability succeeded by increased uncertainty. These insights are valuable for comprehending trading behaviour and forecasting probable market volatility.

ADF and PP tests were applied to the variables under investigation and found to be stationary.

H₀: All the variables are stationary.

The tested results of stationarity are illustrated in table-5.2 given below:

Table 5.2

Stationarity of variables

Variables	ADF test stat	PP test stat
Log Market Return	-15.49179***	-43.80907***
Log volume	-4.054276***	-12.10201***
Log volatility	-10.19519***	-36.87265***

Source: Data computed by the researcher. Note: *** indicates significance at 1%.

The findings of the ADF test and the PP test (Table 5.2) demonstrate that all three variables: Log Return, Log Volume, and Volatility, exhibit stationarity at the 1% significance level, indicating that none of the variables possesses a unit root and their statistical characteristics remain stable over time without trending indefinitely higher or lower. The ADF test statistic (-15.49179) and the PP test statistic (-43.80907) are both significantly negative, far beyond the critical threshold for Log Return, confirming that returns do not follow a random walk and are stationary (Dickey & Fuller, 1979). The ADF test statistic (-4.054276) and PP test statistic (-12.10201) indicate robust stationarity for Log Volume, while the ADF test statistic (-10.19519)

and PP test statistic (-36.87265) confirm that volatility is stable, suggesting that market instability variations are predictable and do not exhibit long-term trends.

All variables are stationary, and differencing is unnecessary; the data are therefore suitable for direct application in time series modelling, including VAR. The lag duration for estimating the VAR model was determined using the SC, with AIC suggesting a lag of 9 and SC recommending a lag of 6; SC was selected to avoid overfitting, as it imposes a heavier penalty for model complexity, which is particularly important for stock market data. One of the most important indicators of overconfidence is the significant, positive beta coefficients of market return in the volume equation, which indicate that trading volume rises as market returns rise, a pattern widely documented in behavioural finance literature as a hallmark of OCB (Odean, 1998; Statman et al., 2006; Prosad et al., 2013). Market return (Rm_t) coefficients are reported in Table 5.3 for the following lags.

Table 5.3

VAR Results (2014 to 2022)

Variable (Lag)	Coefficient	Std. Error	t-Stat.	Prob.
Rm_t (-1)	2.415967	0.442441	5.460539	0.0000***
Rm_t (-2)	1.821803	0.436671	4.172024	0.0000***
Rm_t (-3)	1.033672	0.433593	2.383970	0.0172**
Rm_t (-4)	1.498274	0.431727	3.470419	0.0005***
Rm_t (-5)	1.155057	0.432066	2.673332	0.0075***
Rm_t (-6)	0.796201	0.432215	1.842141	0.0655*
Volatility	-0.008214	0.000651	-12.60777	0.0000

Source: Data computed by the researcher. Note: * shows $\alpha 10\%$ ** shows $\alpha 5\%$ and ***shows $\alpha 1\%$

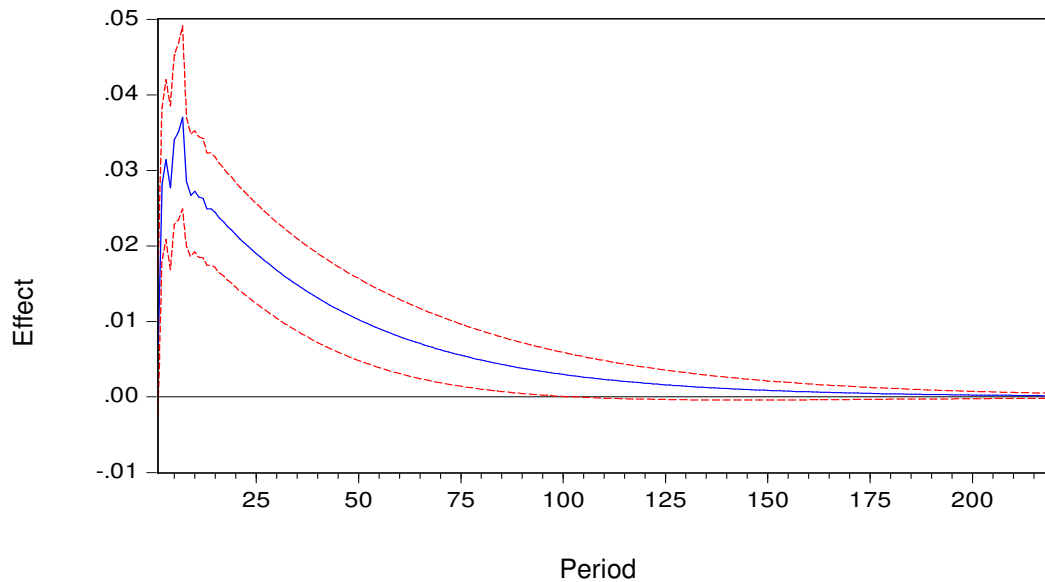
The results from Table 5.3 confirm the presence of OCB in the Indian stock market, as multiple lagged return coefficients in the volume equation are positive and statistically significant. This indicates that as market returns increase, trading volume also rises, demonstrating that traders react to past gains by trading more. The

significance of market return at shorter lags suggests that traders respond quickly to recent market performance, reinforcing their belief in their ability to predict trends.

When Volume is the dependent variable, the R-squared value of 84.10% indicates that a substantial portion of the variability in Volume is explained by lagged market returns, lagged Volume, and volatility, thereby affirming the significance of these factors in trading behaviour. The model also produces a high adjusted R-squared, underscoring its robustness. The Durbin-Watson value (1.947) indicates no significant residual autocorrelation, suggesting that the model captures dependencies effectively without serial correlation.

When Market return is the dependent variable, both the R-squared and modified R-squared are notably low (about 9%), indicating the model's limited ability to explain variations in returns based on trading volume and volatility. This discovery suggests that returns are primarily influenced by external factors rather than historical market trends, supporting the notion that excessive trading does not inherently improve profitability (DHS, 1998; Statman et al, 2006).

The equation with Volume as the dependent variable is more dependable for analysis, as it accurately reflects the relationship between historical market returns, market volatility, and volume variations during the designated timeframe. The presence of substantial and affirmative market return coefficients in the volume equation further substantiates the presence of OCB in the Indian stock market, indicating that traders engage in excessive trading after prior gains, thereby reinforcing their conviction in predictive accuracy (Statman et al., 2006; Prosad, 2017). Figure 5.1 shows the Impulse Response of Log Volume to Log Market Return.

Figure 5.1*IRF of Volume to Return (2014-22)*

Source: Computed data

The impulse response of volume to a return shock indicates significant OCB in the Indian stock market. The graph reveals that the peak on the 7th day is at 3.7%, and it persists until the 200th day. This means that investors tend to trade frequently after achieving good returns. This increase in trading activity aligns with the influence of overconfidence bias among investors, which posits that investors tend to overestimate the accuracy of their information and their ability to forecast market trends in the future. This overconfidence made them trade more since they think their past success will continue. The effect is strongest at first (up to about 10 days); however, it weakens over time. This long-lasting reaction shows that prior returns still affect investor behaviour even in the long term. The fact that returns affect volume only in one direction, with no meaningful effect in the other (as shown by the weak response of returns to volume), supports the idea that trading activity is driven by past performance, a key sign of OCB.

From these results, we can reject our H0_a: The Indian equity market is not affected by OCB. As the VAR results show a significant positive relation between lagged market return and volume traded, the Indian stock market is affected by OCB as reported by (Ganesh et al, 2022; Prosad, 2019; Safeeda & Ganesh, 2025).

5.2 OCB During Different Swan Phases

$H0_b$: The magnitude of OCB does not vary between different phases.

The data in Table 5.4 indicate the trend of stock market movements in the stages of White Swan, which symbolises stability; Grey Swan, symbolising a level of uncertainty; and Black Swan, which symbolises extreme uncertainty.

Table 5.4

Descriptive Statistics of Variables

Phase	Log Market return		Log Volume		Log Volatility	
	Mean	S.D	Mean	S.D	Mean	S.D
White swan	0.0004	0.008	20.691	0.378	1.311	0.337
Grey swan	0.0007	0.014	21.485	0.297	1.519	0.512
Black swan	0.0006	0.018	21.477	.306	1.630	0.28

Source: Computed data

The average log return on the market is quite similar for the phases, just a little higher in Grey Swan at 0.0007 compared to White at 0.0004 and Black Swan at 0.0006. This implies that the average returns change by not much, even when there is a crisis phase, but will perhaps vary more, that is, have higher standard deviations in the Grey and Black Swans, indicating the fluctuations in return during uncertain periods.

The lowest log value of trading volume in White Swan is 20.691. However, this rises in the Grey and then in the Black Swan period above 21.4. This means there is more trading in the markets due to uncertainty or a crisis. This shows that the Indian stock market trading was not held back by the uncertainty, but traders were trying to exploit the price fluctuations brought on by the pandemic.

Volatility rises substantially, for example, from 1.311 in White Swan to 1.519 in Grey Swan, and then to 1.630 in Black Swan situations, which means that market fluctuation occurs in such markets. It means that during White Swan market stability, the returns are consistent, volumes are moderate, and volatility is low, which explains peaceful market trading environments. When there is moderate market uncertainty, meaning in a Grey Swan market situation, the volumes trade greatly due to investor

activity, and there is substantial volatility, along with highly variable returns. Extreme market uncertainties, known as Black Swan markets, experience huge volumes along with extremely high volatility, showing chaotic markets characterized by high risk along with average returns comparable to other phases.

This is consistent with the finance theory that the volume of trading and the level of volatility are positively related; they become high during a period of increased uncertainty; but the average return is not very high on a daily basis (Kao et al., 2020).

5.2.1 Overconfidence Bias During the White Swan Phase

The period from 1st April 2014 to 31st December 2019 is considered the white swan period, as it was comparatively less volatile and more stable than the stock market during the pandemic. The OCB of the Nifty 500 index during this phase is discussed in this part.

H0: All variables are stationary.

Table 5.5

Stationarity of variables

Variables	ADF test stat	PP test stat
Log Market Return	-33.93749***	-33.78858***
Log volume	-5.115456***	-17.61096
Log volatility	-12.07707***	-33.09895***

Source: Data computed by the researcher. Note: *** shows significance level of 1%.

Table 5.5 shows that since all p-values are below 0.01, the findings validate that log market return, log volume, and log volatility are stationary and not unit-rooted. This indicates that their statistical characteristics are time-invariant, rendering them appropriate for VAR analysis.

According to the SC, the lag length that best fits the VAR model is 4, where the SC value of -6.987 at lag 4 is the lowest. This implies that four lags strike a balance between model complexity and information loss. Choosing lag 4 ensures that the

model captures the relevant past dependencies between returns and volume without adding too many parameters, thereby preserving its interpretability.

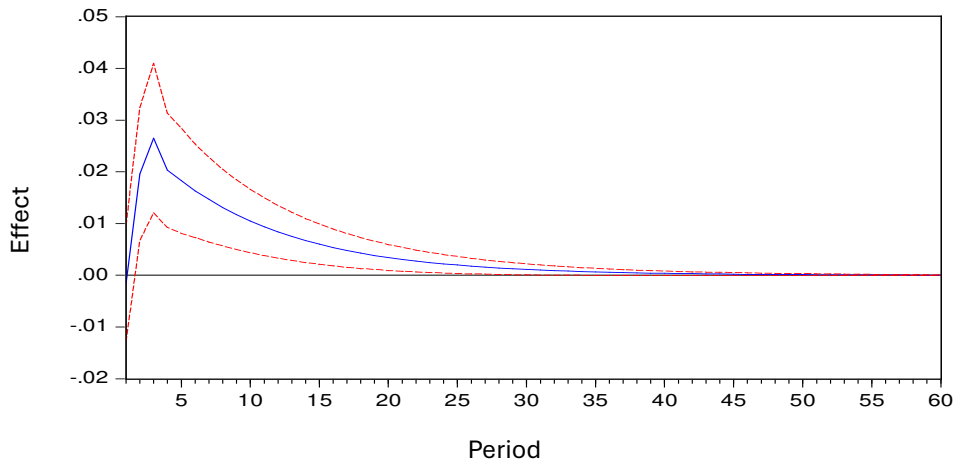
Table 5.6

VAR Result During White Swan Phase.

Variable (Lag)	Coefficient	t-Stat.	Prob.
$Rm_t (-1)$	2.888337	4.485388	0.0000***
$Rm_t (-2)$	1.690667	2.647073	0.0082***
$Rm_t (-3)$	0.208269	0.326756	0.7439
$Rm_t (-4)$	1.984291	3.141497	0.0017***
Volatility	0.170124	10.02766	0.0000***

Sources: Computed data. Note: *** shows significance level of 1%.

According to Table 5.6, the VAR model confirms the presence of OCB in the Indian stock market before the pandemic, as traders significantly heightened their trading volume following past returns (Azam & Baig, 2022). The initial return lag is markedly positive and statistically significant, indicating that traders react swiftly to market movements, resulting in excessive trading shortly after realising profits. The second and fourth lags are significant at the one percent level, perpetuating a momentum-based trading pattern in which success fuels ongoing high-frequency trades, sometimes at the expense of risk assessment (Goswami et al., 2022). The robust R-squared value of 0.716 in the volume equation signifies that historical returns, volatility, and lagged volume substantially influence trading behaviour, whereas the low R-squared value of 0.092 in the return equation suggests that returns are not predictable based on prior trading volume, indicating that excessive trading does not necessarily lead to increased profits, the evidence of OCB (Azam & Baig, 2022; Ganesh et al., 2022). The significance of volatility in the volume equation suggests that investors undervalue market risk, resulting in increased trading activity even during periods of uncertainty (Ganesh et al., 2022; Goswami et al., 2022).

Figure 5.2*IRF of Volume to Market Return During White Swan Phase*

Source: Computed data

The IRF of trading volume to a return innovation during the pre-pandemic period (Figure 5.2) exhibits a distinct behavioural pattern indicative of OCB. A positive return shock results in a substantial increase in trading activity, as evidenced by the abrupt peak on Day 3, with a magnitude of approximately 2.7%. This immediate reaction suggests that investors influenced by recent gains are engaging in excessive trading driven by overconfidence. The response begins a gradual decline after the zenith and reaches the x-axis on day 40. So, the bias persisted in the market until the 40th day.

5.2.2 Overconfidence bias during The Grey swan phase

This section discusses OCB in the Indian exchange during the pandemic period of 2020-2022.

Table 5.7*Stationarity of variables*

Variables	ADF test stat	PP test stat
Log Return	-15.49179***	-43.80907***
Log volume	-4.054276***	-12.10201***
Log volatility	-10.19519***	-36.87265***

Source: Primary data. Note: *** shows significance level of 1%.

Since all p-values are below 0.01 in Table 5.7, the findings validate that log return, log volume, and log volatility are stationary and not unit-rooted. This indicates that their statistical characteristics are time-invariant, rendering them appropriate for VAR analysis.

To determine the optimal lag for VAR estimation, the SC was used. The results indicated that the fourth lag of SC was significant; therefore, the optimal lag used for the VAR analysis was four.

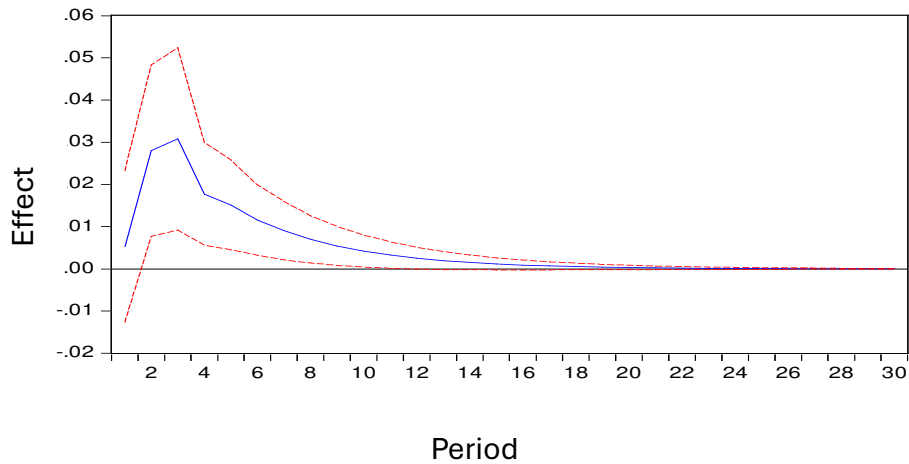
Table 5.8

VAR Result during Grey Swan Phase

Variable (Lag)	Coefficient	t-Stat.	Prob.
$Rm_t (-1)$	1.779326	2.796521	0.0053***
$Rm_t (-2)$	1.372054	2.180689	0.0294**
Volatility	0.095026	4.935034	0.0000***

Sources: Computed data. Note: *** shows significance level of 1%, ** shows significance at 5%.

Table 5.8- VAR results during the grey swan phase show that historical returns had a significant effect on trading volume. This shows that investors were quite overconfident. The significant (first lag at 1% and second lag at 5%) and positive coefficients on lagged returns indicate that traders sold more following past gains. This supports their belief that they could predict the market's future direction even when there was greater uncertainty (Azam et al., 2022; Shrotryia & Kalra, 2021). Additionally, volatility had a positive effect on trading volume (0.0950, $p = 0.0000$), suggesting that investors disregarded risk considerations and traded excessively even when the market was volatile (Verma & Panwar, 2025). The shift is in line with the usual OCB, which suggests that investors believe they can handle uncertain conditions better than they can. This made the market more active throughout the pandemic (Safeeda & Ganesh, 2025).

Figure 5.3*IRF of Volume to Market Return During Grey Swan Phase*

Source: Computed data

The pre-pandemic world experienced a unique behavioural pattern in terms of the IRF of trading volume to a market return, as evident in Figure 5.3. The peak occurs on Day 3 with a value of about 3.2%, indicating that a positive return shock leads to a substantial rise in trading volumes. The rise is a manifestation of an excess reaction that is probably fuelled by overconfidence in the wake of a performance gain. The reaction begins a continuous decline after reaching a peak and subsides gradually until it dies out on Day 20, indicating that excessive trading is a transitory phenomenon that self-corrects. The argument that excessive trading is a transient phenomenon, not persistent, is supported by the immediate peak followed by gradual degradation. This analysis is in line with findings in behavioural finance literature (Statman et al., 2006; Gervais & Odean, 2001) that suggest an excess trading phenomenon in which overconfident traders react to their performance gains by trading aggressively.

5.2.3 Overconfidence Bias During Black Swan Phase

With the rapid global spread of the coronavirus, India's experience was no different. The country implemented several nationwide lockdowns and measures to limit public contact to curb further transmission. In a nutshell, we were facing an unprecedented event in this century, one that could be described as a Black Swan phase, as outlined by Taleb (2021).

Table 5.9*Stationarity of variables*

Variables	ADF test stat	PP test stat
Log Market Return	-4.423729***	-17.51350***
Log volume	-4.956037***	-7.454840***
Log volatility	-3.621366***	-7.302140***

Source: Data computed by the researcher. Note: *** shows significance level of 1%.

All the variables under the VAR model are stationary, as per the ADF and PP tests (Table 5.9). Hence, we proceed with VAR. To estimate the optimal lags, both SC and AIC were used. SC suggested one lag as optimum, hence the VAR run with one lag. The results of VAR are shown in Table 5.10.

Table 5.10*VAR Results During The Black Swan Phase*

Variable (Lag)	Coefficient	Std. Error	t-Stat.	Prob.
$Rm_t (-1)$	0.2775	0.7658	0.3624	0.7172
Volatility	0.04981	0.02394	2.0808	0.0380

Source: Data computed by the researcher

The VAR model for the Black Swan phase of 2020 fails to provide empirical evidence of overconfidence bias in the Indian stock market. The coefficient on lagged market returns is positive but statistically insignificant ($\beta = 0.2775$; $p = 0.717$), indicating that past returns did not influence current trading volume. The results indicate that during the events of significant and unparalleled market disruption, exemplified by the nationwide lockdown and the abrupt decline of the Nifty index in March 2020, investors do not engage in overconfident trading. Based on prospect theory, investors under extreme pressure tend to be highly loss-averse and aim to preserve their capital rather than promote confidence (Kahneman & Tversky, 1979). Because the pandemic was unprecedented, it must have significantly heightened the availability bias, in which continuous exposure to alarming health and economic information outshone private signals and prior market experience (Tversky & Kahneman, 1973). The results support the above analysis, with the statistically significant volatility coefficient

further emphasizing the fact that trading volumes during this period were more driven by exogenous events of market-wide risk and low market-wide confidence rather than return-driven optimism. In the Indian market context, extreme volatility, large FII outflows, and market-wide retail paralysis created an environment devoid of confidence in market predictions (Sreelakshmi et al., 2022; Berger, 2022; and Syed et al., 2024). Survival instincts will trump cognitive biases during extreme events, leading to momentary reversals in confidence-driven trading activity (Jain & Kesari, 2021).

5.3 Relation Between Volatility, Market Return and Volume

The variables used to investigate OCB in the Indian stock market are market returns, volume, and volatility. In this section, the relationship between these variables is investigated to understand how it can explain the OCB and its effect. Table 5.11 shows these relations.

Table 5.11

Relation Between Volatility, Market Return and Volume

Variable		Volatility			
		2014-22	2014-19	2020-22	2020
Market Return	Coefficient	-0.008	-0.007	-0.009	-0.007
	Std error	0.000	0.000	0.001	0.002
	t-stat	-12.607***	-10.381***	-7.083***	-2.989***
Volume	Coefficient	0.1520	0.170	0.095	0.187
	Std error	0.0127	0.0169	0.019	0.071
	t-stat	11.896***	10.276***	4.935***	2.628***

Source: Computed data. Note: *** shows significance level of 1%, ** shows significance at 5%.

During White Swan phase, the Grey Swan phase, the Black Swan phase, and throughout the period studied, i.e. from 2014 to 2022, OCB arose in the Indian stock market. The presence of bias was identified by observing the relation between volume and market return lagged, which is positive across various lags during these phases. Apart from these, in this study we examine the relationship between the dependent variable market return and the independent variable volatility, as well as the

relationship between the dependent variable volume and the independent variable volatility.

Results show that Volume and volatility are positively related, implying that as market becomes volatile, traders treat it as an opportunity to gamble, and they work in larger volumes as if they can efficiently predict the market and possess all the information regarding the market, and they take advantage of this volatility, which has positive relation as proposed by Naik & Sethi (2022), Statman et al. (2006), and Karpoff (1987). Therefore, as the market in India becomes volatile, overconfident investors take advantage, and as a consequence, volumes processed during the market rise. Conversely, the relation between market return and volatility appears negative, implying that as the market becomes volatile, return falls.

Therefore, we can conclude that when overconfident investors trade more during periods of volatility, it actually reduces their investment returns. This is the major reason why it is important to know whether the Indian stock market is overconfident or not. These findings will be beneficial to traders as well as authorities while taking investment decisions and formulating policies to protect the market from downfalls and market bubbles.

5.4 Conclusion

Comparison of OCB Across Different Phases

VAR and IRF results show the rejection of H_{0b} : The magnitude of OCB is the same for all periods. The bias across various phases is shown in Table 5.12.

Table 5.12

Comparison of OCB Across Different Phases.

Phases	Peak point (%)	Duration (days)
White swan	2.7	40
Grey swan	3.2	20
Black swan	No OCB	No OCB

Source: Computed data

Table 5.12 shows that the intensity and duration of OCB vary across phases. The manifestation of OCB in the Indian stock market varied during the white swan, grey swan, and Black Swan periods, reflecting shifts in investor behaviour amid differing levels of uncertainty.

During the white swan period, the OCB is observed at a moderate level, reaching a peak of only 2.7 percent, but persists for almost 40 trading days, which is the longest among all other phases. This may be attributed to the low volatility/return environment observed during this period. This environment is prone to self-attribution bias, where investors tend to attribute their successful investments to their skills rather than to other external or market-related factors (Statman et al., 2006). The persistence in OCB is also increased because, according to DHS (1998), individuals tend to be overconfident about their own information when uncertainty is restricted. This may be attributed to the fact that when individuals face low levels of uncertainty, they develop excessive confidence in their personal views. This supports the views proposed by Odean (1998), who argued how a tranquil market environment gives precedence to OCB.

Conversely, in the grey swan phase, the length of OCB is merely 20 days, compared to 40 days in the white swan phase. The severity of the bias is greater during the grey swan phase (3.2%). The uncertainty caused by the COVID-19 pandemic led to significant volatility in the stock market (Refer to Table 5.4), which highlighted the speculative trading occurring in the market (Ghosh et al., 2025). This suggested that, during this period, investors were engaging in overconfident trading, believing they could profit from speculative activities by capitalizing on the significant volatility in the Indian stock market (Loang, 2025). The pronounced intensity of the bias might be ascribed to availability bias (Rahim et al., 2022), wherein investors favored the most recent positive recovery announcements during trading, as they perceived the recovering market as an opportunity for profit. The persistent fears of the pandemic have resulted in market trading corrections, leading to a reduced duration throughout this era.

The black swan phase of event unpredictability and uncertainty instilled anxiety in the Indian stock market at the onset of the coronavirus epidemic, as it observed the collapse of other markets (Mazur et al., 2021). The increased unpredictability and volatility rendered investors loss averse (Yuwono & Elmadiani, 2021), resulting in the absence of overconfidence bias in the Indian stock market. Investors transitioned to capital preservation and rational trading during this period.

Consequently, the study clearly indicates that predictable times and phases of less uncertainty foster overconfidence bias, while extremely unpredictable events diminish the overconfidence of Indian stock market participants. Therefore, the study suggests that investors should exercise caution regarding their overconfident behaviour during periods of lower volatility, as overtrading may lead to reduced portfolio returns.

A comparison with global research reveals both similarities and discrepancies in the manifestation of OCB under uncertainty. In India, China, Germany, and Egypt, investors exhibit a significant OCB during crises, as evidenced by substantial trading-volume responses to historical returns, thereby confirming trend-chasing behaviour in volatile periods (Azam et al., 2022; Metwally & Darwish, 2015). However, industrialized economies like the U.S. and Japan demonstrated reduced overconfidence tendencies, likely due to increased institutional investor participation, which may have mitigated excessive speculation (Shrotryia & Kalra, 2021). Asian economies (China, Thailand) showed similar speculative trends to India (Verma & Panwar, 2025). European and North American markets displayed more behavioural adjustments after shock events (Odean, 1999; Barber & Odean, 2001). These findings indicate that OCB is a global phenomenon, but with varying intensity based on market structure, investor composition, and regulatory frameworks. Understanding these cross-regional variances in investor behaviour can provide valuable insights to policymakers and market participants in developing strategies to address speculative booms during financial crises.

References

- Azam, M. Q., & Baig, M. A. (2023). Does Overconfidence Bias Exist in the Indian Stock Market? An Empirical Analysis Using VAR Environment. *Finance India*, 37(2), 627–644. Retrieved from <https://www.financeindia.org/data/2023/FI372/FI-372-CP07.pdf>
- Azam, M. Q., Hashmi, N. I., Hawaldar, I. T., Alam, M. S., & Baig, M. A. (2022). *The COVID-19 pandemic and overconfidence bias: The case of cyclical and defensive sectors*. *Risks*, 10(3), 56.
- Berger, D. (2022). Investor sentiment: A retail trader activity approach. *Review of Accounting and Finance*, 21(2), 61-82.
- Dev, S. M., & Sengupta, R. (2020). Covid-19: Impact on the Indian economy. *Indira Gandhi Institute of Development Research, Mumbai April*, 1-43.
- Dhingra, B., & Yadav, M. (2024). *An empirical analysis of overconfidence behaviour in the Indian ETF market*. *International Journal of Revenue Management*, 14(1), 72-94.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427–431. <https://doi.org/10.2307/2286348>
- Ganesh, R., Thiagarajan, S., Vasudevan, G., & Naresh, G. (2023). Investors' Overconfidence in the Stock Market. *Copernican Journal of Finance & Accounting*, 12(4), 108–122. <https://apcz.umk.pl/CJFA/article/download/45188/36087>
- Ghosh, I., Chaudhuri, T. D., Sarkar, S., Mukhopadhyay, S., & Roy, A. (2025). Macroeconomic shocks, market uncertainty and speculative bubbles: a decomposition-based predictive model of Indian stock markets. *China Finance Review International*, 15(1), 166-201.

- Goswami, A., Kumar, M., & Sharma, R. (2022). An Empirical Investigation of the Indian Stock Market's Overconfidence Tendency. *Journal of Emerging Technologies and Innovative Research*, 9(2), 363–369. <https://www.jetir.org/papers/JETIR2202045.pdf>
- Times of India. (2022, March 24). Two years on, national Covid-19 plan to end on March 31. *The Times of India*. <https://timesofindia.indiatimes.com/india/two-years-on-national-covid-19-plan-to-end-on-march-31/articleshow/90405782.cms>
- Jain, N., & Kesari, B. (2021). Sharing the economic torment due to covid–19 and pertinent behavioural biases on financial risk resilience ability of security market investors. *PSYCHOLOGY AND EDUCATION*, 58(2), 1073-1091.
- Kumar, J., & Prince, N. (2022). *Overconfidence bias in the Indian stock market in diverse market situations: an empirical study*. *International Journal of System Assurance Engineering and Management*, 13, 3031–3047.
- Loang, O. K. (2025). *Why Do Investors Act Irrationally? Behavioral Biases of Herding, Overconfidence, and Overreaction*. Vernon Press.
- MacKinnon, J. G. (1996). Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics*, 11(6), 601–618.
- Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *The Journal of Finance*, 53(6), 1887–1934. <https://doi.org/10.1111/0022-1082.00078>
- Prosad, J. M., Kapoor, S., & Sengupta, J. (2013). Impact of overconfidence and the disposition effect on trading volume: An empirical investigation of Indian equity market. *International Journal of Research in Management & Technology*, 3(4), 109–116.

- Rahim, A., Bangash, R., & Khan, M. H. (2022). Impact of Availability Bias Effect on Investment Decisions of South Asian Stock Market Individual Investors during Covid-19 Pandemic. *Indian Journal of Economics and Business*, 21(2), 186-99.
- Safeeda, K. A., & Ganesh, R. (2025). *Grey Swans and Investor Delusions in the Indian Stock Market*. *International Research Journal of Multidisciplinary Scope*, 6(1), 250-262.
- Shrotryia, V. K., & Kalra, H. (2021). *COVID-19 and overconfidence bias: The case of developed, emerging, and frontier markets*. *International Journal of Emerging Markets*, 16(4), 1019-1045.
- Sreelakshmi, R., Sinha, A., & Mandal, S. (2022). Covid-19-related uncertainty, investor sentiment, and stock returns in india. *Economic and Political Weekly*, 53-61.
- Statman, M., Thorley, S., & Vorkink, K. (2006). Investor overconfidence and trading volume. *The Review of Financial Studies*, 19(4), 1531–1565. <https://doi.org/10.1093/rfs/hhj032>
- Statman, M., Thorley, S., & Vorkink, K. (2006). *Investor overconfidence and trading volume*. *Review of Financial Studies*, 19(4), 1531–1565.
- Syed, A. A., Ullah, A., & Kamal, M. A. (2024). Impact of COVID-19 and lockdown stringency on foreign institutional investment in India: evidence from wavelet coherence and spectral causality approaches. *Quality & Quantity*, 58(3), 2433-2452.
- Verma, M., & Panwar, M. (2025). *Overconfidence Bias in Equity Market: A Comparative Analysis of Market Uncertainty and Tranquil Periods in Asian Economies*. *Advances in Economics, Business and Management Research*, 324.

Yuwono, W., & Elmadiani, C. (2021). The effect of emotional contagion, availability bias, overconfidence, loss aversion, and herding on investment decisions in the millennial generation during the beginning of the Covid-19 pandemic. In *Proceedings of the 1st International Conference on Law, Social Science, Economics, and Education, ICLSSEE* (pp. 1-8).

Chapter 6

DISPOSITION EFFECT IN THE INDIAN STOCK MARKET (DE)

6.1	DE in The Indian Stock Market	87
6.2	DE During Different Swan Phases.....	88
6.2.1	DE During White Swan Phase	88
6.2.2	DE During the Grey Swan Phase.....	88
6.2.3	DE During Black Swan Phase.....	89
6.3	Conclusion.....	90
	References.....	93

Objective 2: To identify and analyse the presence of the disposition effect in the Indian stock market over white swan, grey swan and black swan phases.

6.1 DE in The Indian Stock Market

H0_a: The Indian stock market is not affected by the disposition effect.

This section examines whether the Indian stock market is affected by the DE. For this, the daily trading data of 441 constituent stocks of Nifty 500 are considered for the period 1st April 2014 to 31st March 2022. The ADF and PP tests confirmed the stationarity of all the variables. SVAR results are shown in Appendix I, and the IRF results are exhibited in Appendix II. Appendix III presents the IRF statistics, including the bias peak rate, peak day, the day the bias starts to decline, and the duration of the bias in days for each stock.

During this period, a significant positive correlation was observed between volume and stock returns across 124 stocks in the Nifty 500. This implies that if the returns on a stock increase, a simultaneous increase in the trading volume of the same stock is observed, and vice versa, meaning that investors sell their stocks too early when they see a profit but hold on to underperforming stocks in the hope of a future price recovery. This explanation and evidence of loss aversion, described by Shefrin & Statman (1985), have been observed within the Indian stock market by Prosad et al. (2017), Safeeda & Ganesh (2024), and Bharandev & Rao (2019). The IRF results show the persistence of DE in the Indian stock market for this time span. The DE in the Indian stock market existed for an average of 22 days, peaking on Day 1 at 14%. This indicates that the bias has existed in the market for nearly a month, reaching its peak on the very first day. Compared to OCB during this period, the duration of the DE is lower, but its strength is larger.

Accordingly, we reject the null hypothesis and accept the alternative hypothesis that the Indian stock market is affected by the DE.

6.2 Disposition Effect During Different Swan Phases

H0_b: The intensity of disposition effect does not change over different phases.

Under this section, the DE is analysed during the white swan, grey swan and black swan phases in the equity stocks of Nifty 500.

6.2.1 DE During White Swan Phase

The VAR results for the white swan phase, indicating that 129 stocks within the Nifty 500 index were affected by the DE during this relatively stable pre-pandemic period (Appendix I). Despite lower volatility and relatively predictable events, investors continued to exhibit behavioural biases, particularly a tendency to sell winning stocks prematurely while retaining losing stocks in the hope of recovery.

The IRF results show that the DE persists for an average of approximately 20 trading days, reaching its peak on about the 1.43rd trading day, with a maximum rate of 15.73% (Appendices II and III). The longer duration of the bias during this phase may be attributed to stable market conditions and gradual information diffusion, which allow investors to delay corrective actions (DHS, 1998; Hong & Stein, 1999). In such environments, the absence of severe external shocks enables behavioural biases to persist over a longer horizon (Weber & Camerer, 1998). Notably, the strength of the DE in this phase surpasses that of OCB during the white swan phase, underscoring the predominance of loss aversion even in normal market conditions. However, the persistence of OCB (40 days) exceeded that of DE during the white swan phase, indicating that overconfident investors took longer to correct their portfolios in a relatively predictable market.

6.2.2 Disposition Effect During the Grey Swan Phase

The grey swan period represents the overall COVID-19 pandemic period, which has been marked by increased uncertainty, frequent market corrections, and changing policy responses. The VAR result (appendix I) shows that during this period, 179

stocks of the Nifty 500 were influenced by the DE, significantly higher compared to their white swan counterparts.

The IRF analysis (Appendices II and III) indicates that the bias remains significant for 19.5 trading days, peaks at an average magnitude of 13.70% on the 1.84th trading day, and then slowly reverts. Although the peak magnitude is marginally lower than during the white swan phase, the wider diffusion of the bias in stocks reflects stronger loss aversion due to uncertainty. Investors are more likely to minimise losses when faced with unclear information about the duration and economic effects of the pandemic. However, they tend to realise their gains quickly to mitigate perceived risk (Barberis et al., 1998). Periods marked by increased uncertainty and unclear information, exemplified by the COVID-19 pandemic, cause loss aversion and cautious trading behaviour, consequently elevating the incidence of the DE across a wider array of equities (Baker et al., 2020).

Under uncertainty, investors are more reluctant to realise losses while continuing to realise gains to reduce perceived risk exposure (Barberis, Shleifer, & Vishny, 1998). This behaviour is consistent with the prospect theory of stronger loss aversion when the probabilities of the future outcomes are unknown. During the Grey swan phase, the intensity of DE is larger than that of OCB, but the duration of the bias is the same during this period.

6.2.3 Disposition Effect During Black Swan Phase

The introductory phase of the COVID-19 pandemic, has brought greater uncertainty and volatility in the stock market. This demands examination of DE during this phase.

The black swan phase captures the initial outbreak of COVID-19 and the imposition of nationwide lockdowns in 2020, a period marked by extreme volatility and unprecedented uncertainty. The VAR results (Appendix I) indicate that 191 stocks in the Nifty 500 index exhibited susceptibility to the DE during this phase, the highest among all periods examined.

The IRF results (Appendices II and III) show that the DE reached a maximum intensity of 18.23% around the 1.84th trading day and persisted for approximately 17

trading days. The high rate, coupled with a shorter duration, reflects investors' rapid and emotionally driven responses to severe market stress. The urgent need for liquidity, panic-driven decision-making, and heightened fear of further losses likely prompted investors to realise gains aggressively while postponing the sale of losing stocks. These findings are consistent with prior studies documenting the amplification of behavioural biases during crisis periods (Chakraborty, 2023; Sahoo, 2021; Khan et al., 2024).

The observation that the DE exhibits greater intensity yet shorter duration during the black swan phase, in contrast to the OCB, can be attributed to the divergent emotional and cognitive foundations of these biases. The DE, driven by loss aversion and fear, reacts strongly to extreme market fluctuations, resulting in a more intense but shorter-lived bias as traders adapt to the adverse environment (Barberis & Xiong, 2009). In contrast, the OCB, influenced by belief systems and the illusion of control, evolves gradually and persists longer during the learning process of selective learning, policy-induced optimism, and the perception of recovery (DHS, 1998). So, while the immediate crisis shock lowers the DE, cognitive biases like overconfidence last longer during periods of uncertainty (Barberis et al., 1998; Shiller, 2020).

6.3 Conclusion

This section compares the DE over the white swan, grey swan, and black swan phases. Table 6.1 shows the comparison.

Table 6.1

Comparison of the Disposition Effect in the Indian Stock Market Over Different Phases

Phases	Number of Stocks Affected	Peak point (%)	Duration (Days)
White swan	129	15.73	20
Grey swan	179	13.70	19.5
Black swan	191	18.23	17

Source: Data computed by the researcher

The analysis denied the null hypothesis that the DE is uniform across all phases.

The number of stocks affected by the DE increases from the white swan phase (129 stocks) to the grey swan phase (179 stocks) and reaches its maximum during the black swan phase (191 stocks). This pattern suggests that as market uncertainty and volatility intensify, behavioural biases become more widespread across securities. During periods of extreme stress, such as the initial outbreak of the COVID-19 pandemic, investors of various firms are simultaneously exposed to negative shocks, amplifying loss aversion at the market level. Consequently, the DE extends beyond firm-specific fundamentals and becomes more pervasive.

The black swan phase (18.23%) has the highest peak rate for the DE, followed by the white swan phase (15.73%) and the grey swan phase (13.70%). The extraordinarily high intensity observed during the black swan era can be attributed to acute anxiety, panic, and heightened emotional reactions provoked by unparalleled uncertainty and sudden market downturns. Prospect theory posits that loss aversion intensifies when outcomes are perceived as losses amid great uncertainty, resulting in aggressive liquidation of profitable equities and an aversion to acknowledging losses (Kahneman & Tversky, 1979; Shefrin & Statman, 1985). However, the white swan phase is marked by market conditions that are generally steady, yet the disposition impact still shows a very high peak intensity. This shows that investors still want to make money and avoid losing money, even when things are peaceful. This is because they want to avoid feeling regret and because their preferences depend on what they see (Weber & Camerer, 1998). The decreasing intensity during the grey swan phase may be due to investors' adaptive behaviour, as they slowly got used to the uncertainty caused by the pandemic and started using more cautious and varied trading tactics (Lo, 2004).

The DE lasts the longest during the white swan phase (20 days), the second longest during the grey swan phase (19.5 days), and the shortest during the black swan phase (17 days). This inverse correlation between intensity and duration signifies varying behavioural dynamics across regimes. In stable markets, the lack of major corrective shocks lets behavioural biases last longer because investors face less pressure to rebalance portfolios or liquidate positions (Hong & Stein, 1999; DHS, 1998). On the

other hand, the DE is very strong during the black swan phase, but it doesn't last as long because the market adjusts quickly, forcing sales, margin calls, and liquidity problems, which make investors change their positions more quickly (Shiller, 2020; Baker et al., 2020). The grey swan phase is a middle ground where long-term uncertainty keeps the bias going, but regular updates of knowledge and changes in policy slowly reduce its strength.

Hence, the study reveals that the DE exhibits varying behaviours across different periods.

References

- Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The review of asset pricing studies*, 10(4), 742-758.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of financial economics*, 49(3), 307-343.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of financial economics*, 49(3), 307-343.
- Barberis, N., & Xiong, W. (2009). What drives the disposition effect? An analysis of a long-standing preference-based explanation. *the Journal of Finance*, 64(2), 751-784.
- Bharandev, S., & Rao, S. N. (2019). Disposition effect at the market level: evidence from Indian stock market. *Review of Behavioral Finance*, 12(2), 69-82.
- Chakraborty, I. (2023). Impact of Covid-19 on the Stock Market and Corporate Firms in India. In *Exploring What Drives Indian Stock Market During Covid-19: Fads or Fundamentals* (pp. 17-33). Singapore: Springer Nature Singapore.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. *the Journal of Finance*, 53(6), 1839-1885.
- Gupta, K., Das, S., & Gupta, K. (2022). Volatility in Indian stock markets during COVID-19: An analysis of equity investment strategies. *International Journal of Business Analytics (IJBAN)*, 9(1), 1-16.
- Hong, H., & Stein, J. C. (1999). A unified theory of underreaction, momentum trading, and overreaction in asset markets. *The Journal of finance*, 54(6), 2143-2184.
- Kahneman, D. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 278.

- Kao, Y. S., Chuang, H. L., & Ku, Y. C. (2020). The empirical linkages among market returns, return volatility, and trading volume: Evidence from the S&P 500 VIX Futures. *The North American Journal of Economics and Finance*, 54, 100871.
- Khan, M. N., Fifield, S. G., & Power, D. M. (2024). The impact of the COVID 19 pandemic on stock market volatility: evidence from a selection of developed and emerging stock markets. *SN Business & Economics*, 4(6), 63.
- Lo, A. W. (2004). The adaptive markets hypothesis: Market efficiency from an evolutionary perspective. *Journal of Portfolio Management*, *Forthcoming*.
- Prosad, J. M., Kapoor, S., Sengupta, J., & Roychoudhary, S. (2017). Overconfidence and disposition effect in Indian equity market: An empirical evidence. *Global Business Review*, 19(5), 1303-1321.
- Safeeda, K. A., & Ganesh, R. (2024). Unmasking the grey swan: Investor biases in times of turbulence. *Indian Journal of Finance*, 56-72.
- Sahoo, M. (2021). COVID-19 impact on stock market: Evidence from the Indian stock market. *Journal of Public Affairs*, 21(4), e2621.
- Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, 40(3), 777-790.
- Shiller, R. J. (2020, July). COVID-19 has brought about a second pandemic: financial anxiety. In *World Economic Forum* (Vol. 2).
- Weber, M. and Camerer, C.F. (1998) The Disposition Effect in Securities Trading: An Experimental Analysis. *Journal of Economic Behaviour and Organization*, 33, 167-184.

Chapter 7

OCB & DE IN DIFFERENT MARKET CAPS ACROSS SWAN PHASES

7.1	OCB and DE in Large Cap During the White Swan Phase	95
7.2	OCB and DE in large cap during grey swan	96
7.3	OCB and DE in large cap during black swan	98
7.4	OCB and DE in Mid-cap During the White Swan Phase	98
7.5	OCB and DE in Mid-cap During Grey Swan Phase.....	99
7.6	OCB and DE in Mid-cap During Black Swan Phase.....	100
7.7	OCB and DE in Small-cap during White Swan Phase.....	101
7.8	OCB and DE in Small-Cap During Grey Swan Phase.....	101
7.9	OCB and DE in Small-Cap During Black Swan Phase.....	102
7.10	Comparison of OCB and DE Across Market Caps Over Different Swan Phases.....	103
7.11	Conclusion.....	107
	References.....	109

Objective 3: To compare the OCB and the DE across large-cap, mid-cap and small-cap stocks of the Indian stock market over white swan, grey swan and black swan phases.

H0_a: The OCB and DE do not vary across market caps during different swan phases.

This section examines variation in OCB and DE across the Nifty 500 index's large-, mid-, and small-cap stocks during the white swan, grey swan, and black swan phases. The degree of investor confidence varies according to market capitalisation of the companies they invest in (Kumar & Sabharwal, 2024; Riyadh et al., 2024), volatility, and the accuracy of market forecasts (Du & Budesku, 2007; Gupta et al., 2023; Rupande et al., 2019).

7.1 OCB and DE in Large Cap During the White Swan Phase

The OCB and DE analysis results of VAR and IRF in large-cap stocks during the white swan phase are given in the appendices (Appendix IV, V and VI).

The white swan phase, representing the pre-pandemic era of 2014-19, showed the presence of both OCB and DE. Among 163 large-cap stocks, 51 (31.29%) exhibited the DE, 38 (23.31%) exhibited OCB, and a single stock exhibited both biases. 75 (46%) large-cap stocks were unaffected by either bias.

The DE typically peaked on the 2nd trading day (1.92 days) at an average level of 11.94%, and then began to decline on the same day. Although its persistence lasted for approximately 18.5 days, indicating that while investor responses were instantaneous, the impact of loss aversion took nearly three weeks to subside. This is indicative of investors' persistent tendency to dispose of winning stocks sooner and hold on to losing stocks until a gain comes.

In the large-cap stocks of the Nifty 500 index, 23.31% were affected by the OCB during the white swan phase. Indicating that high predictability and the blue-chip images of large-cap stocks drive OCB in the minds of investors. The peak point of the bias was noted on the 2.54th day on average at 6.24%, which is lower than the peak point of DE and it started draining on the same day (2.74th day). But the duration of the OCB is quite longer than DE that is 20.2 days. This shows that OCB was less severe yet more enduring in investor behaviour. This means that when the market seemed predictable with lower volatility, investors' optimism, and faith in their ability to anticipate the future of their investment took a long time to correct.

In general, the data show that behavioural biases emerged during the white swan period, though not as strongly as during times of crisis. The OCB was less common but lasted longer, while the DE was more common and stronger. The presence of a significant pool of unbiased stocks (46%) underscores that, in stable situations and pre-pandemic contexts, rational choice frameworks were more pronounced, and behavioural distortions, while evident, did not overshadow market forces in large-cap stocks.

7.2 OCB and DE in large cap during grey swan

During the grey swan period from 2020 to 2022, the large-cap sector of the Indian equities market showed a clear superiority of the DE over the OCB (Appendix IV, V and VI). Empirical findings demonstrate that 49.69 per cent (81 stocks) of large-cap companies were influenced by the DE; in contrast, only 25.15 per cent (41 equities) showed the presence of OCB, underscoring a significantly greater occurrence of loss-averse behaviour throughout this timeframe. This difference shows that investors are more sensitive to uncertainty and negative risk, which is typical of grey swan circumstances where dangers may be seen but their results are still unknown (Taleb, 2010).

The magnitude of the DE exceeds that of the OCB during the grey swan phase. The maximum rate of DE reached 13.4 per cent on the 1.91st day, while OCB peaked at 8.33 per cent on the 2.6th day. The duration of the DE exceeded that of the OCB; specifically, the DE lasted for 20 days while the OCB lasted just 17.5 days. These

findings indicate that during periods of heightened volatility and diminished predictability, the Indian stock market is influenced by both biases; however, the DE is more pronounced due to the loss-averse mentality generated by the COVID-19 pandemic. This aligns with prospect theory, which posits that investors experience losses more intensely than gains, leading to asymmetric risk preferences under uncertainty (Kahneman & Tversky, 1979). Grey swan conditions intensify this disparity, as investors strive to grab profits despite fears of further market downturn (Shefrin & Statman, 1985).

The duration further supports the idea that the DE is the last longer in during uncertain periods. The DE lasted for more than 20 days, showing that investors were still unwilling to accept losses. In contrast, OCB had a shorter duration (17.5 days), indicating that overconfident trading slowly took a back seat as market signals continued to be unpredictable and unclear. Previous research posits that overconfidence is more prevalent in stable or strongly trending markets, where feedback bolsters investors' confidence in their predictive capabilities (DHS, 1998). In grey swan phases, inconsistent information flows and frequent regime shifts undermine these reinforcing mechanisms, consequently constraining the persistence of OCB (Gennaioli et al., 2018).

Interestingly, just three large-cap stocks displayed both biases simultaneously, and 26.9 per cent of stocks (44) showed no signs of either bias. The long duration of the DE suggests that fear-induced conservatism surpasses confidence-fuelled risk-taking in conditions of heightened, albeit not wholly unforeseen, uncertainty (Barberis et al., 1998).

In general, the results show that the DE was not only more common and stronger during the grey swan period, but it also lasted longer than the OCB in the large-cap category. This behavioural pattern shows that investors would rather protect their cash and prevent regret than trust their own judgement when it comes to speculation. The results highlight the necessity of integrating state-dependent behavioural biases into asset pricing models and market efficiency evaluations, especially in contexts marked by extended uncertainty rather than abrupt systemic failure.

7.3 OCB and DE in large cap during black swan

During the black swan phase of the COVID-19 pandemic, the large-cap stocks were affected by OCB as well as DE (Appendix IV, V and VI). Out of 163 stocks, 44.17 per cent (72 stocks) exhibited DE, and only 15.16 per cent (27 stocks) were under OCB. The perception of large-cap stocks as “safe” led investors to cling to underperformers, hoping for price recoveries (Wei & Yang, 2012), which in turn strengthened DE. Additionally, the unforeseen shocks that existing models could not account for diminished investor overconfidence (Shrotryia & Karla, 2023).

None of the stocks showed both biases simultaneously, and 39.26 percent (64 stocks) were beyond the purview of both biases. This suggests that large-cap stocks are either confidence-driven or fear-driven; the occurrence of both phenomena seems rare in large caps during the grey swan phase. This discovery suggests that investors are more likely to favour a prevailing behavioural response rather than fluctuate between conflicting biases. Not only in numbers but also in the magnitude of bias, the DE (15.56%) dominated OCB (10.16%) over this period, but the persistence of bias in the market was longer for OCB (17.6 days) than for the DE (15.4 days). Because OCB is a trait like bias which is rooted in one’s personality (Qadri & Shabbir, 2014) and such investors rationalise their decisions (He, 2022) which results in prolonged persistence, whereas DE is more like situational, which is triggered by gain or loss (Shefrin & Statman, 1985), and tends to be corrected when losses reach a level that cannot be overlooked.

7.4 OCB and DE in Mid-cap During the White Swan Phase

During the pre-pandemic white swan phase, Mid-cap stocks in the NIFTY 500 showed the influence of both biases (Appendices VII, VIII, and IX). Out of 138 stocks, 89 stocks (64.49%) seemed overconfident, and 27 stocks (19.56%) reflected the DE. Unlike large-cap stocks, 19 (13.76%) showed both biases, and 43 (31.16%) were unaffected by any of these biases. This indicates that, in this phase, OCB was the dominant behavioural trait of mid-cap investors, possibly driven by optimism and a sense of control in a relatively stable market setting.

Even though the spread of DE was less than OCB, its intensity is greater. It generally peaked on the first trading day (1.07 days) at a mean rate of 17.14%, then started decreasing right away and lasted for about 16.96 days. The steep rise and moderate duration indicate that, even under stable conditions, fear of loss affected trading choices. Conversely, OCB was more common and lasted longer in mid-cap stocks. It also peaked on day 1 (1.07 days), but at a lower peak rate of 8.81%, and only began decreasing after the second trading day (2.39 days). Its average duration was 22.85 days, showing that investors held positive expectations and continued trading for over three weeks. This pattern reflects a deep-rooted faith in forecasters' power and influence, even when market signals do not support such beliefs.

The presence of both biases simultaneously in 19 stocks indicates that, at times, investors exhibited conflicting behaviours, selling winners too early while trading aggressively due to overconfidence. This dual bias may result from complex psychological responses to market signals, especially in mid-cap segments where volatility and growth prospects coexist. Overall results show that during the white swan period, overconfidence bias was more common and consistent. In contrast, the DE was more intense and acute, collectively shaping mid-cap investor decision-making in a broadly stable market.

7.5 OCB and DE in Mid-cap During Grey Swan Phase

The OCB and DE test results in Mid-cap securities of Nifty500 during the grey swan phase are given in Appendices VII, VIII, and IX.

A notable coexistence of OCB and DE was observed among mid-cap stocks during the grey swan period. The DE was present in 54 (38.57%) stocks, which is higher compared to the number of stocks affected by OCB, that is, 33.57% (47 stocks). During this period, nine stocks were presented with both biases, and 34.28% (48 stocks) remained unaffected by both biases. This indicates that the period of uncertainty and volatility has instilled a fear of financial loss among some investors. In contrast, another group of investors has viewed this fear as an opportunity to gain more, which is reflected in the market as an OCB.

The DE exhibited a higher bias intensity, with a peak on the 1.57th day at 16.57%. In contrast, overconfidence peaked at 10.23% and took 2.3 days to reach its highest point. However, given the persistence of market biases, the OCB was present in mid-cap stocks for more than 21 days, whereas the DE lasted approximately 18 days. This behaviour is visible across all periods among mid-cap stocks, with the intensity of the DE higher and the duration of the OCB longer. Mid-cap stocks, characterised by substantial growth potential and limited analyst coverage, lead investors to retain underperforming assets in anticipation of future gains. This informational asymmetry fosters a reliance on personal convictions rather than fundamental analysis. Since OCB is a cognitive bias ingrained in an individual's character, its rectification in the stock market requires more time than that required for DE.

7.6 OCB and DE in Mid-cap During Black Swan Phase

This section examines OCB bias and DE in mid-cap securities during the black swan phase. Appendices VII, VIII, and IX present the results of the VAR run used to trace the OCB and DE.

In mid-cap stocks of the Nifty 500, notable behavioural distortions were evident during the black swan period. The DE was prominent over the period, as it was reflected in 52.89 per cent of stocks (73 stocks). Only 9 stocks (6.5%) showed the OCB, and both biases were present in 6 mid-cap stocks. This indicates that fear-driven behaviour was most prevalent among Indian mid-cap equity investors. During the black swan phase, 64 stocks were unaffected by both biases.

The average intensity of the bias was higher for the DE, with an average peak rate of 22.15%, and the bias persisted in the market for 19.41 days. Although the intensity was low (10.76%), the presence of bias (25.77 days) was more pronounced in the OCB. The DE reached its peak on the 1.5th day, while the OCB peaked on the 2.77th day.

During the black swan period, the DE was the dominant and more intense bias, while the OCB, though less frequent, had a lingering influence. This imbalance underscores how crisis conditions trigger psychological responses in which fear outweighs

optimism, particularly in mid-cap segments characterized by higher volatility and lower institutional coverage.

7.7 OCB and DE in Small-cap during White Swan Phase

The VAR and IRF results of OCB and DE in small capital stocks during the white swan phase are depicted in Appendices X, XI and XII.

During the white swan period, 81.15% of small-cap stocks were biased; only 18.8% (26 stocks out of 138) were unaffected by either bias. Because small-caps are mostly traded by retail investors who are more prone to behavioural biases (Briere et al., 2023). During this phase, the OCB was most prominent among small-cap stocks, with 61.89% (85 stocks) exhibiting the bias, 36.95% (51 stocks) demonstrating the DE, and 17.39% (24 stocks) displaying both biases. Although the presence of OCB exceeded that of the DE, the intensity of the DE was higher compared to OCB, reaching 18.53% on its peak day (first day). In contrast, the peak rate for OCB was 9.5% on the 2.38th day. Considering the longevity of biases, the OCB persisted for approximately 25 days in the Indian stock market, and the DE was present for approximately 23 days.

The presence of both biases in 24 equities underscores the complexities of investor psychology in small-cap markets, where overconfidence and fear may coexist, potentially driven by volatility, limited information, and low liquidity. The high volatility and speculative nature of small-cap stocks made investors simultaneously loss-averse and overconfident. The observations indicate that the OCB was widespread and persisted longer during the white swan period.

7.8 OCB and DE in Small-Cap During Grey Swan Phase

During the grey swan period of the pandemic, 52.17 per cent (72 stocks) of small-cap stocks were reported to be affected by OCB, 31.88 per cent (44 stocks) by the DE, seven per cent (10 stocks) by both biases, and 32 stocks (23.18%) remained unaffected by either bias. This analysis reveals that investors in the small-cap sector showed overconfidence as the dominant behavioural trait throughout this transitional phase (Appendices X, XI, and XII).

During this period, the number of stocks affected by OCB was high, and the bias's duration was similarly high. The OCB persisted for approximately 24 days, reaching its peak on the 3rd day (2.84th day) and peaking at 1.147%. In the case of DE, the bias persisted in the market for 19 days, and the peak point was 10.877%, which was reached on the second day.

OCB persisted longer due to its characteristic bias rooted in optimism and the sense of control. This facilitated investors in rationalising their decisions and maintaining their confidence, especially during challenging circumstances. DE surged sharply and promptly, as it is contingent upon situational factors and driven by immediate profits or losses and loss aversion. It diminishes when losses accumulate, and investors acclimate to them. OCB is prevalent across numerous stocks, with its persistence and intensity during the grey swan phase in small-cap stocks. A substantial group of investors was prepared to capitalise on the market's volatility and the loss-averse tendencies of another group, demonstrating the DE.

7.9 OCB and DE in Small-Cap During Black Swan Phase

The analysis reports the presence and absence of OCB and DE in small-cap stocks of Nifty 500 during the black swan phase (Appendices X, XI, and XII).

Looking at the biases in the Nifty 500 index's small-cap stocks during the black swan phase, OCB seemed to override the DE. OCB was reported in 57 (41.3%) stocks, and 46 (33.33%) stocks were affected by the DE. Ten stocks also exhibited both biases. Stocks that were unaffected by either bias accounted for 31.1% (43 stocks).

OCB was present in these stocks for 18.52 days on average, reaching its peak rate of 12.64% on the 3rd day. The duration of the DE (15.65 days) was lower than that of the OCB. Still, the effect rate was higher than that of OCB, that is, 16.156%, and the peak day was the 2.17th day.

Even in this improbable period, small caps are overtrading due to irrational trading by retail investors who are mostly dependent on their own estimates and speculations (Sharma & Negi, 2025). Hence, whenever there is a positive return from their portfolio, they attribute it to their skill and keep on trading and speculating (Gorzon

& von Nitzsch, 2025). When investor see a positive return on their portfolio, they sell off it immediately due to the fear of the unpredictable market and heightened volatility, at the same time some investors hold onto the losers in the hope of further price rebound, and they also face the illiquidity problems of small cap stocks in the market, especially when it is at a loss (Aqvist, 2025).

7.10 Comparison of OCB and DE Over Different Swan Phases

The following section compares the OCB and DE across different swan phases and market caps, and draws a conclusion about the behaviour.

Table 7.1

Comparison of OCB and DE in large, mid, and small-cap stocks over Swan phases

Capitalization		Period			
		White Swan	Grey Swan	Black Swan	2014-22
Large Cap (163)	DE	51	81	72	43
	OCB	38	41	27	39
	BOTH	1	3	0	5
	UNAFFECTED	75	44	64	86
Mid Cap (138)	DE	27	54	73	29
	OCB	89	47	9	119
	BOTH	19	9	6	22
	UNAFFECTED	43	48	64	14
Small Cap (138)	DE	51	44	46	52
	OCB	86	72	57	3
	BOTH	24	10	10	0
	UNAFFECTED	25	32	45	83

Source: Computed data

Large-Capitalization Stocks

In the large-cap equities, the DE established its supremacy over the OCB in every phase. In the White Swan, 51 equities were impacted by the DE, 38 equities were affected by the OCB, and only one stock experienced both phenomena as depicted in

Table 7.1. In the black swan, the DE's presence was raised to 72 equities, contrasted with its decrease in the OCB, which affected 27 equities, while no equities exhibited two phenomena. In the Grey Swan, the DE retained its dominance, affecting 81 equities, while the OCB had a mild impact, affecting 41 equities. In the entire duration, 43 equities exhibited the DE, 39 equities exhibited the OCB, and 86 remained unaffected.

The findings align with the findings of Rangelova (2001), as the prevalence of this effect for large-cap stocks is consistent with evidence from investor trading data, which shows that aversion to selling losing stocks is more pronounced in higher-capitalisation segments, suggesting that investor perceptions and information flow have a significant impact on the behavioural outcomes of large-cap stocks. Also supports Chung & Chuwonganant (2012), who indicated that human intervention via trading floors improves liquidity and price efficiency, thereby stabilising investor behaviour during crises. The persistent existence of the DE in large-cap equities illustrates loss aversion under uncertainty, as described in Prospect Theory (Kahneman & Tversky, 1979).

Medium Capitalisation Stocks

Mid-cap equities exhibited the most behavioural volatility. In the white swan period, OCB was predominant in 89 equities, whereas the DE was observed in just 27, of which 19 stocks exhibited both biases. During the black swan period, the DE intensified in 73 stocks, overconfidence diminished in 9 equities, and 6 stocks exhibited both biases, indicating heightened worry and behavioural strain. The grey swan period underwent a rebalancing: the DE was observed in 54 stocks, overconfidence in 47, and dual bias in 9 cases. Throughout the period, OCB prevailed in 119 equities; the disposition impact manifested in 29, while just 14 stocks remained unaffected.

Mid-cap shares have shown a lot of behavioural volatility since this group is at the crossroads of growth potential and increased uncertainty. During the white swan phase, OCB was encouraged by reasonably stable market circumstances and positive return expectations. This was because investors tended to think they were better at

picking stocks and making good decisions than they really were (Barber & Odean, 2001; Daniel et al., 1998). The relatively limited occurrence of the disposition effect during this period suggests that diminished volatility eased the psychological distress linked to selling decisions. In contrast, the black swan period saw a rapid rise in the DE. This was because investors were very uncertain and sensitive to losses, thus they held on to losing positions while taking profits too soon to prevent regret (Shefrin & Statman, 1985; Kahneman & Tversky, 1979).

The simultaneous decrease in overconfidence indicates diminished self-assurance with intense market pressure. The grey swan phase is a time of behavioural rebalancing, when the market showed signs of both recovery and uncertainty, allowing both biases to coexist. This meant that decisions were confusing still with bias. In general, the fact that overconfidence has lasted throughout the entire period shows that mid-cap investors are still hopeful. On the other hand, the fact that the disposition effect has only happened occasionally shows that mid-cap investors are more likely to be affected by behavioural distortions during times of market turbulence (Barberis et al., 1998).

Small-Capitalization Stocks

Small-cap stocks demonstrated a distinct behavioural pattern. OCB was evident in 86 equities during the white swan phase; the DE was observed in 51 stocks; and 24 stocks displayed both biases. In the black swan phase, overconfidence was prevalent in 57 stocks, DE in 46, and 10 stocks had dual biases. The grey swan phase exhibited a tendency towards overconfidence, encompassing 72 stocks, alongside a disposition impact involving 44 stocks. Throughout the entire period, the DE persisted in 52 stocks, the OCB diminished to merely 3, and no stock exhibited both biases, while 83 stocks remained unaffected.

The behavioural volatility observed in Indian small-cap shares, particularly the prevalence of OCB during stable and recovery phases, aligns with findings from the Chinese market. In this context, individual investor sentiment, as indicated by the number of newly opened trading accounts, significantly influences small-cap returns

and exhibits characteristics of short-term gain inertia and spillover effects (Yong, 2015).

Changes in OCB and DE across different market stages reveal how investors' feelings, risk perceptions, and uncertainty in the small-cap segment are evolving. During the white swan period, market conditions were quite stable, and investors were hopeful about their returns. This led to heightened OCB because investors thought they were better at buying stocks in small-cap companies where there wasn't much public information and the stories of growth were stronger. This setting reduced the stressfulness of losses, keeping the disposition effect relatively low. Since markets entered the black swan phase, intense uncertainty, rapid price corrections, and liquidity constraints greatly diminished OCB, as previous convictions were undermined by unforeseen losses. Simultaneously, the DE is amplified, fuelled by increased loss aversion and regret avoidance, leading investors to retain underperforming small-cap stocks while prematurely realising profits to reestablish a sense of control (Kahneman & Tversky, 1979; Shefrin & Statman, 1985). The grey swan phase is a middle ground between two behavioural states. Partial recovery and mixed signals led to a return of OCB, as speculative trading and recovery optimism came back. The DE went down but remained strong due to lingering uncertainty and memories of recent losses. The inverse relationship between OCB and DE across phases highlights the transition of small-cap investors from optimism-driven behaviour in stable periods to loss-averse decision-making during market stress, illustrating the susceptibility of small-cap stocks to sentiment and uncertainty (Daniel et al., 1998; Barber & Odean, 2001).

DE and OCB Across Different Market Phases

The comparative analysis of capitalisation levels indicates that behavioural biases across different market periods are inconsistent and highly context-dependent. During the white swan period (2014–2019), OCB was prevalent in mid- and small-cap stocks, indicating speculative optimism and retail-driven euphoria in relatively stable market conditions. During the 2020 black swan period, the DE became the predominant bias in mid- and large-cap segments, while small-cap stocks exhibited a mixed trend of

anxiety and speculative vigour. This alteration aligns with findings from Apostolakis et al. (2021), who presented empirical evidence that mid-cap firms transitioned to large-cap firms during the pandemic, amplifying fear-induced behaviour.

Throughout the grey swan period (2020–2022), large-cap stocks exhibited the dominance of DE, mid-cap stocks displayed a relatively balanced mix of biases, and small-cap stocks leaned towards renewed overconfidence, reflecting varied recovery trends across market groups. This phase demonstrates the gradual restoration of investor sentiment to its normative state, consistent with the impulse response findings on volatility by Chung & Chuwonganant (2023), which indicated that liquidity and price efficiency were re-established post-pandemic, particularly in markets characterised by human interaction and structured trading settings. Throughout the period from 2014 to 2022, large-cap stocks demonstrated the most excellent behavioural stability, mid-cap stocks remained susceptible to overconfidence, while small-cap stocks showed a long-term trend towards caution, characterised by minimal overconfidence and a significant proportion of unbiased stocks. The behavioural shift in small-cap stocks is further supported by Yong (2015), who demonstrated that regulatory constraints and increased investor vigilance ultimately tempered speculative surges in smaller markets.

Behavioural asymmetries across capitalisation levels are evident in return distribution analysis: small-cap shares exhibit greater volatility and more extreme outliers, while larger-cap shares show stable, consistent performance. The findings corroborate the behavioural biases identified in this study, particularly the dominance of OCB in small-cap stocks during stable periods and the DE in large-cap stocks during crises (Oraon, 2025).

7.11 Conclusion

The DE is found to be dominant in every stage of large-cap stocks. Because of the strong information visibility and analyst coverage during the white swan period, investors were hopeful about holding losing companies and believed it was worthwhile. Some other stocks in the large-cap displayed OCB as they are fast growth and have a sound financial footing. During the grey swan phase, investors of large-

cap stocks were cautious and loss-averse, so they sold off the gainers before a further decline and held on to losers in expectation of a gradual recovery of large enterprises. Because of increased loss aversion and confidence in these companies' long-term resiliency, DE grew even stronger during the black swan phase, whereas OCB fell precipitously.

Mid-cap equities indicated a transition from speculative OCB to fear-driven loss aversion from white to black swan phase.

Mid-cap displayed elevated OCB during the white swan phase, demonstrating the speculative nature of rising stocks. When it came to grey swan phase loss aversion owing to uncertainty rose, at the same time some investors showed OCB too in hope of future recovery. owing to heightened risk perception mid cap demonstrated DE during black swan period and OCB fell considerably as speculative trade considered more dangerous owing to uncertainty.

Small cap stocks were always exhibiting OCB in the first place reflecting the larger participation of retail investors than institutional investors (Kumar & Shanmugham, 2003) and their biased notion of generating maximum profit out of the volatility speculations. During the black swan phase both OCB and De fade owing to illiquidity and the necessity for capital protection and during the grey swan period the speculative behaviour restored the OCB however risk perception kept DE alive.

The findings confirm that behavioural biases are shaped by a confluence of capitalisation, investor composition, and event predictability. They underscore the imperative of objective risk management strategies, behavioural frameworks, and regulatory initiatives to mitigate irrational market responses during periods of volatility. The differing behavioural trends among large-, mid-, and small-cap companies require tailored strategies for portfolio construction, regulatory monitoring, and investor education, especially during periods of systemic instability.

References

- Apostolakis, G. N., Floros, C., Gkillas, K., & Wohar, M. (2021). Political uncertainty, COVID-19 pandemic and stock market volatility transmission. *Journal of International Financial Markets, Institutions and Money*, 74, 101383.
- Åqvist, D. (2025). The Impact of Liquidity on Stock Price Fluctuations in Sweden's Small-, Mid-, and Large-cap Stocks Surrounding Interim Reports.
- Barber, B. M., & Odean, T. (2001). The internet and the investor. *Journal of Economic Perspectives*, 15(1), 41-54.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of financial economics*, 49(3), 307-343.
- Briere, M., Calamai, T., Di Giansante, F., Huynh, K., & Novelli, R. (2023). Behavioral Biases Among Retail and Institutional Investors. *Available at SSRN 4467369*.
- Chung, K. H., & Chuwongnant, C. (2012). Uncertainty, Fear, and Liquidity. *Shared Growth and Sustainable Development*, 352.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. *the Journal of Finance*, 53(6), 1839-1885.
- Du, N., & Budescu, D. V. (2007). Does past volatility affect investors' price forecasts and confidence judgements?. *International Journal of Forecasting*, 23(3), 497-511.
- Gorzon, D., & von Nitzsch, R. (2025). Behavioral performance attribution of retail investors' portfolio returns. *Financial Markets and Portfolio Management*, 1-32.
- Gupta, R., Nel, J., & Pierdzioch, C. (2023). Investor confidence and forecastability of US stock market realized volatility: Evidence from machine learning. *Journal of Behavioral Finance*, 24(1), 111-122.
- He, Z. L. (2022). An Evolutionary Theory of Overconfidence and Loss Aversion in Adaptive Markets. *Available at SSRN 4115680*.

- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 363-391.
- Kumar, S., & Sabharwal, A. (2024). An Evaluation of Large Cap, Mid Cap, and Small Cap Mutual Funds: Return, Risk, and Investor Considerations. *International Journal of Banking, Risk & Insurance*.
- Oraon, A. (2025). Assessing the Long-term Return Differences Between Small-cap and Large-cap Stocks in Indian Market. *Available at SSRN 5267498*.
- Qadri, S. U., & Shabbir, M. (2014). An empirical study of overconfidence and illusion of control biases, impact on investor's decision making: An evidence from ISE. *European Journal of Business and Management*, 6(14), 38-44.
- Ranguelova, E. (2001). Disposition effect and firm size: New evidence on individual investor trading activity. *Available at SSRN 293618*.
- Riyadh, M. R., Wahyudi, S. T., & Fadli, F. (2024). Capital Resilience: Dynamics Movements of Large Cap and Small-Mid Cap Stock in Global Macroeconomic Uncertainty. *Futurity Economics&Law*, 4(4), 107-120.
- Rupande, L., Muguto, H. T., & Muzindutsi, P. F. (2019). Investor sentiment and stock return volatility: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, 7(1), 1600233. <https://doi.org/10.1080/23322039.2019.1600233>
- Sharma, S., & Negi, V. (2025). Effect of Behavioural Biases on Investors' Decision Making: A Systematic Literature Review. *Metamorphosis*, 24(1), 105-113.
- Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, 40(3), 777-790.
- Shrotryia, V. K., & Kalra, H. (2023). COVID-19 and overconfidence bias: the case of developed, emerging and frontier markets. *International Journal of Emerging Markets*, 18(3), 633-665.
- Wei, J., & Yang, L. (2012). Short-term momentum and reversals in large stocks. *Available at SSRN 2029984*.
- Yong, Q. (2015). Relationship between individual investor sentiment with its volatility and returns of small-cap stocks. *Available at SSRN 2545814*.

Chapter 8

DIFFERENTIAL REACTION TO PRIVATE AND PUBLIC INFORMATION

8.1	Differential Reaction to Private and Public Information.....	111
8.2	Conclusion.....	113
	References.....	114

8.1 Differential Reaction to Private and Public Information

Objective 4: To investigate the overreaction to private information signals in the Indian stock market.

H0: Overconfident investors respond aggressively to private information while responding weakly to publicly accessible information.

It has been observed that an increase in trading volume is primarily due to overconfident investors who place greater weight on private information while underestimating public information (Odean, 1998; DHS, 2001). To examine how investors in the Indian stock market respond to both private and public information, the study employed the Structural VAR model, as recommended by Chuang and Lee (2006). Figure 8.1 shows the impulse response of price to private information signals in the market, and Figure 8.2 shows the impulse response of price to public information signals.

Figure 8.1

IRF of Price to Private Information Signals

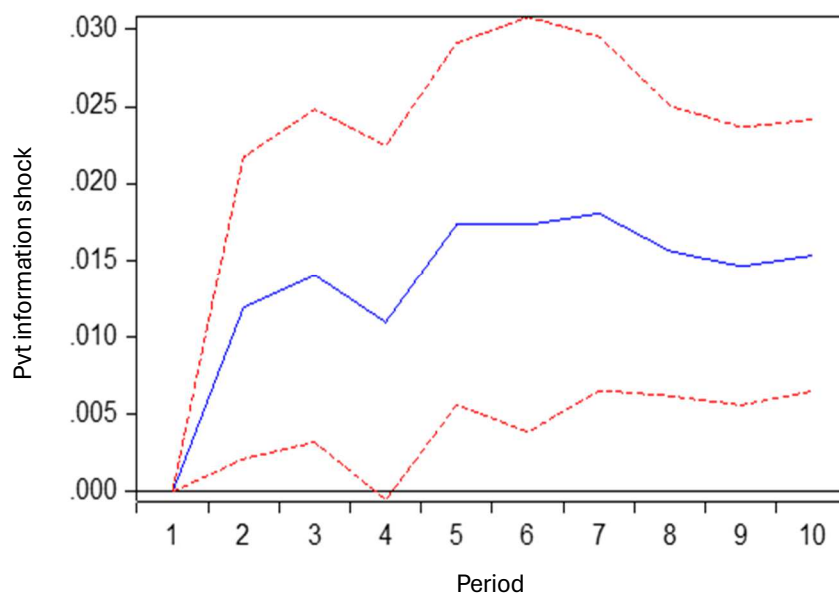
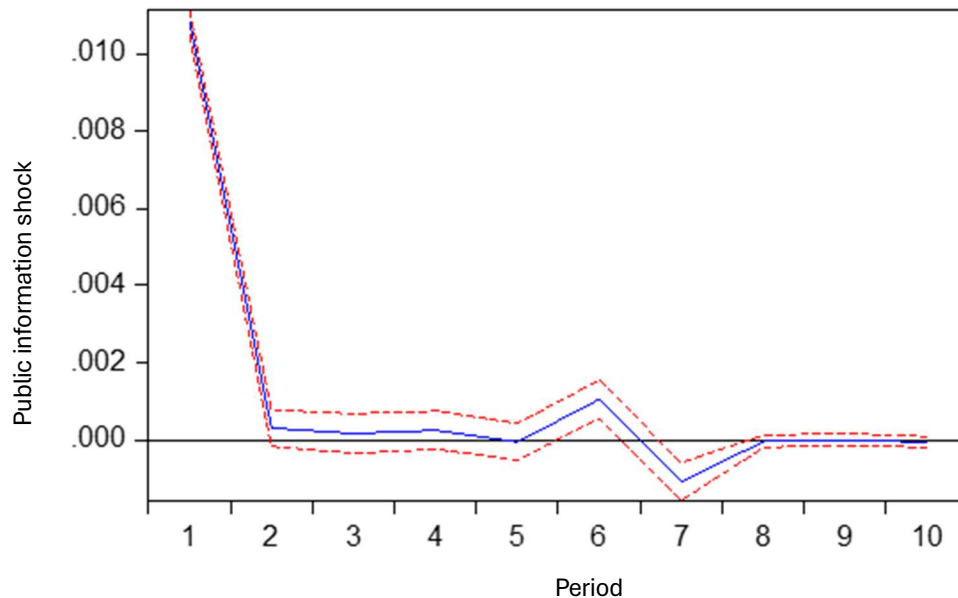


Figure 8.2*IRF of Price to Public Information Signals*

Source: Computed data

The Structural VAR estimate shows significant asymmetry in how the Indian stock market processes private and public information. The overconfidence hypothesis is used as a short-term constraint in the just-identified SVAR model, suggesting that shocks to public information do not have an immediate effect on trading volume. The estimated S matrix supports this, indicating a substantial contemporaneous volume response to private information shocks ($S_{11} = 0.2111$, $p < 0.001$), while public information shocks do not produce such a response. Returns respond significantly to public information shocks ($S_{22} = 0.0108$, $p < 0.001$), but the reaction to private information is minimal ($S_{21} = -0.0004$, $p = 0.069$). These results align with the theoretical ideas proposed by DSH (1998), which suggest that overconfident investors tend to overvalue private signals and undervalue public signals because they believe they have superior information.

IRFs reinforce this behavioural pattern. Prices exhibit a strong, sustained reaction to private information shocks, reflecting overreaction and valuation momentum. Conversely, prices respond quickly but only temporarily to public information shocks, ultimately reversing, indicating an initial overreaction followed by correction (De

Bondt & Thaler, 1985). Trading volume responds modestly to public information, aligning with theories of selective attention and underreaction. These findings support the overconfidence hypothesis in the Indian stock market: private signals lead to excessive trading and price distortions, while public signals are eventually discounted or corrected. This behavioural asymmetry has important implications for market efficiency and investor education in an emerging market like India. Because when investors assume the information they possess are private and significant OCB will emerge and that will lead to overtrading which ultimately affect the fundamental value of the stock as well as average portfolio return (Boussaidi, 2013).

8.2 Conclusion

According to the overconfidence theory, investors overreact to private information and underreact to public information, as supported by structural VAR estimates. Overconfident investors undervalue public information while overvaluing and acting upon private information. Their trading volume will rise when they believe they possess private information, as documented by Chuang and Lee (2008) and Mushinada and Veluri (2018), findings consistent with ours.

References

- Boussaidi, R. (2013). Overconfidence bias and overreaction to private information signals: the case of Tunisia. *Procedia-Social and Behavioral Sciences*, 81, 241-245.
- Chuang, W. I., & Lee, B. S. (2006). An empirical evaluation of the overconfidence hypothesis. *Journal of Banking & Finance*, 30(9), 2489-2515.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and-over reactions. *Journal of finance*, 53, 1839-1886. <http://dx.doi.org/10.1111/0022-1082.00077>
- De Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact?. *The Journal of finance*, 40(3), 793-805.
- Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *The journal of finance*, 53(6), 1887-1934.

Chapter 9

INVESTORS' PERCEPTION TOWARDS OCB AND DE

9.1	Validity and Reliability Tests.....	115
9.2	Demography of the Respondents.....	115
9.3	The Disposition Effect	119
9.4	Overconfidence Bias.....	125
9.5	Role of Private Information and Public Information in Investment Decisions.....	130
9.6	Comparison of Investors' Perception of OC and DE with Actual Market Behaviour	131
	References.....	133

Objective 5: To examine discrepancies between investors' perceived behavioural biases and their actual trading patterns.

9.1 Validity and Reliability Tests

To ensure the validity of the analysis, the reliability of the collected data was first tested using Cronbach's alpha, which yielded a value of 0.779, indicating its suitability for further statistical analysis (Hair et al., 2006). Convergent validity was then ascertained through Principal Component Analysis (PCA). The outcome yielded four components with eigenvalues greater than 1 (Kaiser, 1960), accounting for a cumulative variance of 57.38%, which surpassed the minimum requirement of 50% (Hair et al, 2010). Additionally, the factor loadings of the retained items were assessed, with most above 0.5, indicating very high convergent validity. Lastly, face validity was ensured through the use of a panel of experts, comprising subject-matter experts and professionals in the field, who thoroughly examined the questionnaire to assess its appropriateness and relevance to the study. The KMO measure of 0.803 indicated high sampling adequacy, suggesting that the variables had sufficient intercorrelations. This falls under the "meritorious" category, suggesting that the questionnaire items are appropriate for measuring related constructs (Kaiser, 1974). Bartlett's Test of Sphericity produced a chi-square value of 5219.808 with 136 degrees of freedom and a significance level of 0.000. The significant p-value (< 0.05) confirms that the correlation matrix is not an identity matrix, which indicates meaningful relationships among questionnaire items.

9.2 Demography of the Respondents

The demographic profile of the respondents provides valuable insights into the sample's composition. Table 9.1 illustrates the demographic characteristics of the respondents.

Table 9.1*Demographic Profile of Respondents*

Variables	Category	Frequency	Percentage
Gender	Male	562	49.7
	Female	561	49.6
	Prefer not to say	7	0.7
	Total	1130	100
Age	Up to 20	48	4.2
	21-30	163	14.4
	31-40	388	34.3
	41-50	411	36.4
	51-60	104	9.2
	Above 60	16	1.5
	Total	1130	100
Education	SSLC & below	12	1.1
	Plus two	52	4.5
	Diploma	234	20.7
	Graduate	452	40
	Postgraduate	307	27.2
	Doctoral	73	6.5
	Illiterate	0	0
	Total	1130	100
Occupation	Student	64	5.7
	Profession	142	12.6
	Business	392	34.7
	Salaried employee	394	34.9
	Retired	98	8.7
	Homemaker	33	2.8
	Job seeker	7	0.6
	Total	1130	100
Annual Income	Below 250000	267	23.7
	250000-500000	483	42.7
	500000-1000000	328	29
	Above 1000000	52	4.6
	Total	1130	100

Source: Primary data

The sample consists of an almost equal distribution of male (49.7%) and female (49.6%) respondents. Most respondents fall into the 31-40 age group (34.3%) and the 41-50 age group (36.4%), indicating that the study primarily involves mid-career investors. In terms of education, graduates (40%) and postgraduates (27.2%) make up the largest share of the sample, reflecting a highly educated investor base. The employment profile indicates that private sector employees (34.7%) and government employees (34.9%) predominate, with a smaller proportion of self-employed individuals and students. The annual income distribution indicates that 42.7% earn between ₹2,50,000 - ₹5,00,000, while 29% fall within ₹5,00,000 - ₹10,00,000, reflecting most were middle-income investors. These characteristics suggest that the respondents are well educated, employed across diverse sectors, and have stable income levels, making them active participants in the stock market.

The investment behaviour of respondents, including their experience as investors, trading frequency, reasons for selling holdings, and investment motives, is presented in Table 9.2.

Table 9.2

The Investment Behaviour of Respondents

Variables	Categories	Frequency	Percentage
Investment experience	Less than 1 year	399	35.3
	1-3 years	431	38.2
	4-6 years	258	22.8
	More than 6 years	42	3.7
	Total	1130	100
Trading frequency	Rarely	46	4.1
	Monthly	227	20.1
	Bi-weekly	410	36.3
	Weekly	326	28.8
	Daily	121	10.7
	Total	1130	100

Variables	Categories	Frequency	Percentage
The primary reason for selling stocks	Tax harvesting	166	14.7
	Decrease in dividend policy	268	23.7
	Reaching the target price	380	33.6
	Loss of money	231	20.5
	Unfavourable market conditions	85	7.5
	Total	1130	100
The primary goal of investing	Socially responsible investing	32	2.8
	Passive income	82	7.3
	Wealth accumulation	263	23.3
	Speculative trading	333	29.5
	Asset diversification	243	21.5
	Liquidity	115	10.2
	Hedge against inflation	262	5.5
	Total	1130	100

Source: Primary data

Investment experience analysis reveals that most respondents have relatively fresh stock market experience, with 73.4% having less than 3 years of experience. The fact that only 3.7% of investors have more than six years of investment experience indicates a small group of well-experienced investors. Understanding the level of experience in trading/investment is essential, as experience plays a crucial role in shaping investment behaviour and creating various biases (Mishra & Metilda, 2015).

Trading frequency have been shown to significantly influence behavioural biases and investor returns (Con-Urbach & Joakim, 2006). The trading frequency data shows that most respondents trade at a moderate frequency. The largest group, 36.3%, trades bi-weekly, followed by 28.8% who trade weekly. Monthly trading accounts for 20.1%, while only 10.7% trade daily. A very small proportion, 4.1%, reported rarely trading. This indicates that most investors prefer moderate trading frequencies rather than very frequent or very infrequent trading. This suggests that the majority of respondents are

actively involved in the stock market but do not engage in intensive day-trading behaviour, possibly reflecting a balanced investment strategy that combines monitoring the market with controlled trading activity.

According to Dervishaj (2021), investors who are influenced by a variety of biases have distinct motivations for purchasing or disposing of equities. When considering the main reason for selling stocks, a good percentage of investors (33.6%) sell when the stock reaches a price they had targeted when buying. However, 23.7% sell when they see a decrease in the dividend yield, indicating that a substantial portion of investors are sensitive to consistent dividend payouts. The remaining 20.4% opines that they sell when their investment is in the red, which may indicate risk aversion and panic selling during periods of overall declines. The small but significant 14.7% considering selling their stocks with the motive of tax-loss harvesting.

As for investment objectives, most focus on speculation and wealth accumulation (29.5% and 23.3%, respectively), suggesting that some investors focus on short-term price swings to make a profit, while others are long-term oriented, prioritising building wealth steadily over time. Investing in stocks was made to diversify the asset portfolio by 21.5% of respondents. However, a smaller percentage (10.2%) invests with the motive of liquidity, as stocks can be easily bought and sold. 5.5% of respondents invest in the stock market as a hedging tool against inflation. 2.8% of investors are investing to make socially responsible investments.

9.3 The Disposition Effect

The perception of retail investors regarding the DE in their investment decisions is explained in this section. The hypotheses tested to analyse this bias in the Indian stock market are given below.

Null Hypotheses:

- 1. Investors with varying degrees of trading experience do not significantly differ in the DE.*
- 2. Individual investors and financial advisors do not significantly differ in DE.*

3. *Individual investors and financial advisors do not significantly differ in their levels of investment satisfaction.*

4. *Gender has no effect on DE.*

A moderate presence of the DE among investors, with the highest agreement on the pain of financial loss (Mean 3.44), were found. Other statements show similar mean scores, suggesting a tendency to hold losing stocks longer and sell winning stocks quickly. Results exhibited in Table 9.3.

Table 9.3

Descriptive Statistics of DE Statements

Statements	Mean	Standard deviation	S. E
I find it difficult to let go of stocks at a loss, even if it makes sense.	3.07	1.28	0.038
I sell shares immediately if there is an increase in their value.	3.09	1.28	.038
The pain of financial loss is more than the pleasure of financial gain.	3.44	1.38	0.041
I will wait a long time to increase the value if it is at a loss now.	3.13	2.19	0.038
I occasionally think about the potential missed gains from selling too early.	3.07	1.29	0.038

Source: Primary data

To examine how investment or trading experience influences the DE, a one-way ANOVA was conducted. The DE was measured using five-point Likert-scale items, and the average of these items was computed to create a composite score representing each respondent's overall disposition tendency. This averaged score was then used as the dependent variable in the ANOVA. Before proceeding with the analysis, homogeneity of variance was assessed using Levene's test, which indicated a violation of the assumption ($p < .001$). Consequently, Welch's ANOVA was employed to account for the unequal variances. The ANOVA and corresponding post-hoc results are presented in Table 9.4.

Table 9.4

One-Way ANOVA Test for Investment Experience and DE

Statements	Frequency	Mean	S.E	ANOVA
Less than 1 year	399	3.07	0.041	F= 2.74, P=0.042
1-3 years	431	3.17	0.047	
4 - 6 years	258	3.27	0.064	
More than 6 years	42	3.22	0.131	

Source: Primary data

Table 9.5

Games-Howell Post-Hoc Test for Investment Experience and DE

Group	Particulars	Less than 1 year	1-3 years	4-6 years	Above 6 years
Less than 1 year	Mean Difference	-	-0.108	-0.208	-0.1539
	P- value	-	0.305	0.031	0.677
1-3 years	Mean Difference	-	-	-0.100	-0.0455
	P- value	-	-	0.590	0.988
4-6 years	Mean Difference	-	-	-	0.0546
	P- value	-	-	-	0.982
Above 6 years	Mean Difference	-	-	-	-
	P value	-	-	-	-

Source: Primary data

The One-Way ANOVA was conducted to examine whether investment experience significantly influences the DE. The results indicate a statistically significant difference among groups (F value = 2.74, p = 0.042), suggesting that investment experience affects the DE. The mean DE scores show an increasing trend with experience: investors with less than 1 year of experience score 3.07, those with 1-3 years score 3.17, those with 4-6 years score 3.27, and those with more than 6 years score 3.22. The findings suggest that investment biases tend to increase with

experience, contrary to Feng and Seashole (2005). However, among individuals with more than six years of experience, biases decrease, indicating that while experienced investors may still be prone to biases, they develop strategies to minimise their impact, as noted by Jaiswal (2023). While this pattern suggests a rising bias with experience, the Tukey post hoc test reveals that the only statistically significant difference is between investors with less than 1 year of experience and those with 4-6 years ($p = 0.031$), indicating that the DE is significantly higher among intermediate-level investors than among beginners. No significant differences were observed among the other groups, indicating that the DE does not vary substantially across the remaining experience categories.

Null hypothesis: The DE does not vary between individual investors and financial advisors

Table 9.6

Independent Samples t-Test Results for DE Among Investor Groups

Group	N	Mean	S. E	t value	P value
Individual investor	833	3.20	0.033	-2.18	0.030
Financial Advisor	297	3.06	0.052		

Source: Primary data

The Independent Samples t-Test results indicate a significant difference in the DE between individual investors and financial advisors. Individual investors exhibit a higher mean score (3.20) compared to financial advisors (3.06), suggesting they are more prone to selling winning stocks too early and holding onto losing stocks for too long. The statistically significant P-value 0.03 at a 5 per cent level of significance implies that financial advisors, likely due to their professional expertise and experience, manage the DE better than individual investors. This finding aligns with previous research suggesting that professional investors tend to make more rational decisions, whereas retail investors are more susceptible to the DE (Shapira & Venezia, 2001). The results highlight the importance of investor education and behavioural training programs to help individual investors recognise and mitigate the DE, potentially improving their trading decisions and financial outcomes.

Null Hypothesis: Investment satisfaction does not vary between individual investors and financial advisors.

Table 9.7

Independent Samples t-Test Results for Investment Satisfaction Among Investor Groups

Group	N	Mean	S. E	t value	P value
Individual investor	833	2.79	0.047	2.48	0.013
Financial Advisor	297	3.02	0.077		

Source: Primary data

Table 9.7 shows that financial advisers (Mean 3.02) report noticeably higher satisfaction with their investment decisions than regular investors (Mean 2.79), with a t-test value of 2.48 and a p-value of 0.013. This result aligns with the previous one, demonstrating that retail investors exhibit a notably larger DE (Mean 3.20) than financial advisers (Mean 3.06). Retail investors may have made less-than-ideal trading decisions due to the DE, characterised by the tendency to hold losing stocks too long and sell winning stocks too quickly, thereby reducing satisfaction with their past investments. This implies that cognitive biases, including the DE, contribute to decision-making errors, thereby lowering retail investors' confidence and satisfaction with their investment results.

Null hypothesis: Gender has no effect on DE.

The role of gender on the loss aversion bias has discussed by various researchers. Female investors were found to be more prone to loss aversion bias by Byrnes et al. (1999), Cheng et al. (2013), Rau (2014), etc whereas Shandu and Alagidede (2024) reported that the inclusion of more women in an investor group reduced the DE intensity. In this section, we examine how Indian stock market investors' gender affects the DE.

The ANOVA results (Table 9.8) given below show a significant difference in the DE among gender groups.

Table 9.8*Gender and DE-ANOVA*

Particulars	Frequency	Mean	Std. Dev	S. E	F Value	Significance
Male	562	3.28	0.971	0.041	10.06	0.000
Female	561	3.04	0.885	0.037		
Prefer not to say	7	3.46	0.412	0.156		
Total	1130	3.16	0.934	0.028		

Source: Primary data

The result showed a significant difference between the factors at 1% level of significance. Table 9.9 shows the results of post-hoc test.

Table 9.9*Gender and DE- Games Howell Post hoc test result*

Group	Particulars	Male	Female	Others
Male	Mean Difference	-	0.244	-0.147
	P- value	-	0.000	0.543
Female	Mean Difference	-	-	-0.421
	P- value	-	-	0.079
Others	Mean Difference	-	-	-
	P- value	-	-	-

Source: Primary data

The Games-Howell post hoc test (Table 9.9), appropriate for unequal variances, indicates that males exhibit a significantly greater DE than females, with a mean difference of 0.244 ($p < .001$). Differences between males and prefer not to say group, and females and prefer not to say group, are not statistically significant. This is in line with the findings of Bouteska and Rgaieg (2018), Frino et al. (2015) Cueva (2019), Oreng et al. (2024), and Gong and Wright (2013) and contradicts the findings of Rau (2014) and Shandu and Alagidede (2014). The study shows that DE in the Indian stock market is influenced by gender, and measures should be taken to mitigate its impact on female investors through investor education programs.

9.4 Overconfidence Bias

This section examines how retail investors perceive their confidence level in investment decisions. The study tested the following null hypotheses.

Null Hypotheses:

1. The level of OCB does not vary between retail investors and financial advisors.
2. OCB does not differ with the level of experience.
3. OCB does not vary between gender categories

Five statements were used to inquire about the OCB among respondents. Table 9.10 presents the statements and their average values and standard deviations.

Table 9.10

Statements checking the OCB

Statement	Mean	Standard deviation	S.E
I feel that I have good understanding of the stock market compared to an average person	3.20	1.22	0.040
I always feel that my own decisions are right about investments	3.18	1.26	0.036
As I gain more information about the stock or market situation, my confidence on my prediction naturally increases.	3.57	1.38	0.038
My instincts can never be wrong about my investment decisions.	2.78	1.35	0.041
I believe that beating the market is very easy for me	3.15	1.35	0.040
Average of all statements	3.18	.61	

Source: Primary data

The descriptive statistics suggest that investors exhibit moderate to high levels of confidence in their stock market knowledge and investment decisions. The highest mean (3.57) corresponds to the belief that gaining more information increases confidence in predictions, indicating certainty OCB, where investors become

excessively assured of their predictions as they acquire more information, regardless of its accuracy. Investors also rate themselves above average in understanding the stock market (3.20) and believe their investment decisions are generally correct (3.18). However, confidence in instincts being wrong is relatively lower (2.78), suggesting some level of uncertainty in purely intuition-based decision-making. The belief that beating the market is easy (3.15) further reflects the bias. The overall average score (3.18) indicates a moderate presence of OCB, where investors may overestimate their knowledge and ability to predict market movements, potentially leading to excessive risk-taking or misjudgement in investment decisions.

Table 9.11 shows the results of the t-test conducted to examine the level of bias among different investment groups, viz., retail investors and financial advisors.

Null hypothesis: The level of OCB does not vary between retail investors and financial advisors.

Table 9.11

Result of the T-test for OCB among different investor groups

Group		N	Mean	Std Dev	S. E	T stat	P value
OCB	Financial advisors	297	3.28	0.672	0.04	3.29	0.001
	Individual investors	833	3.14	0.589	0.02		

Source: Primary data

The Independent Samples T-Test results indicate a significant difference in OCB between investor types ($t = 3.29$, $p = 0.001$), with financial advisors (Mean = 3.28) exhibiting higher overconfidence than individual investors (Mean = 3.14). The findings suggest that, despite their expertise, financial advisors may overestimate their ability to predict market movements, reinforcing the notion that professional experience can sometimes amplify rather than mitigate overconfidence. This finding contradicts Seppala (2009), who found that professional expertise mitigated OCB. This contradiction may be due to market differences.

Null hypothesis: OCB does not differ with the level of experience.

Behavioural biases are influenced by investors' experience in the stock market (Rekik & Boujelbene, 2013). A one-way ANOVA was conducted to examine how experience in the stock market shapes OCB. Table 9.12 shows the results.

Table 9.12

Results of ANOVA- Overconfidence and Experience in Investing

Particulars	Frequency	Mean	Std. Dev	S. E	F Value	Significance
Less than 1 year	398	3.084	0.553	0.028	4.905	0.002
1-3 years	432	3.243	0.667	0.032		
4-6 years	258	3.208	0.603	0.037		
More than 6 years	41	3.181	0.581	0.089		
Total	1130	3.176	0.614	0.018		

Source: Primary data

The following Table 9.13 illustrates the post-hoc test results.

Table 9.13

Games-Howell Post-Hoc Test for Investment Experience and OCB

Group	Particulars	Less than 1 year	1-3 years	4-6 years	Above 6 years
Less than 1 year	Mean Difference	-	-0.158	-0.124	-0.097
	P- value	-	0.001	0.04	0.729
1-3 years	Mean Difference	-	-	0.0335	0.0603
	P- value	-	-	0.905	0.921
4-6 years	Mean Difference	-	-	-	0.0268
	P- value	-	-	-	0.993
Above 6 years	Mean Difference	-	-	-	-
	P value	-	-	-	-

Source: Primary data

The One-Way ANOVA results indicate a significant difference in OCB among investors with varying levels of experience, suggesting that investment experience influences confidence levels. Levene's test is significant at the 1% level, indicating unequal variances and requiring Welch's ANOVA for accurate analysis. The Games-Howell post hoc test reveals that investors with less than 1 year of experience exhibit significantly lower overconfidence than those with 1-3 years and 4-6 years of experience. In contrast, other group differences are not statistically significant. These findings suggest that overconfidence increases with experience, particularly in the early to moderate stages. However, the effect diminishes as experience grows, aligning with the Dunning-Kruger effect, in which investors with moderate experience may overestimate their abilities before gaining a more realistic self-assessment with further experience, decisions, and financial outcomes.

Null hypothesis: There is no difference in the degree of OCB between gender categories.

According to Pompain and Longo (2004), behavioural biases are perceived and demonstrated differently by various gender groups. Various researchers have reported that males are more overconfident than females in a variety of contexts, including daily life events and tasks (Lewellen et al, 1977; Lundeberg et al., 1994; Lenney, 1977). The stock market context has also reported on this tendency of males to be overconfident (Barber & Odean, 2001; Gervais & Odean, 2001; Glaser & Weber, 2007; Mishra & Metilda, 2015). In contrast, Kansal and Singh (2018) conducted a study in the Indian stock market that concluded that gender does not influence OCB.

This section investigates the disparity in OCB levels among various gender categories in the current Indian stock market.

Table 9. 14*Gender and OCB-ANOVA*

Particulars	Frequency	Mean	Std. Dev	S. E	F Value	Significance
Male	562	3.223	0.612	0.025	4.414	0.012
Female	561	3.133	0.614	0.026		
Others	7	2.800	0.489	0.185		
Total	1130	3.176	0.614	0.018		

Source: Computed data

The ANOVA analysis (Table 9.14) reveals a significant difference in OCB among different gender groups. Post hoc Tukey HSD tests (Table 9.15) indicate that males exhibit significantly higher overconfidence than females, with a mean difference of 0.909 ($p = .035$). No significant differences were found between males and others or females and others.

Table 9.15*Gender and OCB- Tukey Post hoc test results*

Group	Particulars	Male	Female	Others
Male	Mean Difference	-	0.909	0.423
	P- value	-	0.035	0.164
Female	Mean Difference	-	-	0.332
	P- value	-	-	0.327
Others	Mean Difference	-	-	-
	P- value	-	-	-

Source: Primary data

These findings align with previous behavioural finance research, which consistently shows that males are more overconfident in financial decisions than females (Barber & Odean, 2001; Prasad & Mohta, 2012; Trejos et al., 2019). Barber and Odean (2001) documented that male investors exhibit higher overconfidence, leading to greater trading frequency and potentially lower returns. The findings also contradict Deaves et al. (2009), Kansal & Singh (2018) and Zainul and Suryani (2021) reports, which found that gender does not affect OCB.

Thus, this analysis confirms that gender plays a significant role in OCB, supporting theories from prior literature emphasising gender-based behavioural differences in investment contexts. The significant difference between males and females offers insights into behavioural interventions such as targeted financial education aimed at reducing overconfidence and improving investment decisions across genders.

9.5 Role of Private Information and Public Information in Investment Decisions

When choosing an investment, information is crucial. Information is prioritised by investors based on their perception. According to published research, investors respond differently to public and private information. Insider information, strategic business information, and market-sensitive data, such as private negotiations or debt restructuring, are examples of private information. Public information, on the other hand, is information that is readily and publicly accessible to all parties, such as company announcements, annual reports, corporate governance disclosures, analyst reports, and ratings, etc. To distinguish how investors respond to public and private information, Nofsinger (2001) found that investors tend to overreact to information they believe is private, leading to a rise in trading volume. As a manifestation of OCB, investors overreact to signals of private information, according to Boussadi (2013) and Adam et al. (2025). The overreaction of stock prices and trading volume to private information has been documented in a number of studies (Chuang & Lee, 2006; Vega, 2006; Mushinada & Veluri, 2018). Here, we look into how Indian stock market investors view both public and private information.

Table 9.16

Role of Private and Public Information on Investment Decisions

Statement	Mean	Standard deviation	S. E
I respond quickly to private information	3.06	1.24	0.038
I believe that private information is more important than public information in shaping my investment decisions	3.15	1.19	0.038
I am more likely to act on private information	3.08	1.24	0.037

Statement	Mean	Standard deviation	S. E
Publicly available information has a minimal role in influencing the stock prices	3.08	1.27	0.035
Private information, such as insider trading news, significantly influences my decisions	3.01	1.29	0.037

Source: Primary data

The descriptive statistics indicate that investors exhibit a moderate reliance on private information in their decision-making, with mean values ranging from 3.01 to 3.15 across the five statements. The highest mean (3.15) suggests that investors generally perceive private information as more important than public information in shaping their investment strategy. Similarly, they show a moderate tendency to respond quickly to private information (3.06) and act on it (3.08). The influence of insider trading news on investment decisions is slightly lower (3.01), indicating some variability in reliance on such information. Overall, these findings suggest that while private information plays a role in investors' strategies, their reliance on it is not overwhelmingly strong. Additionally, the average score for overreaction to private information is 3.08, further supporting the presence of OCB, where investors tend to overreact to private information while underreacting to public information, potentially leading to suboptimal investment decisions (Chuang & Lee, 2006).

9.6 Comparison of Investors' Perception of OC and DE with Actual Market Behaviour

The study compares investors' actual trading behaviour in the Indian stock market with their perceptions about OCB and the DE using both primary and secondary data. While secondary data, which included daily trading data, was utilised to analyse actual investor behaviour, primary data was gathered to capture investor perceptions. Both the DE and OCB were found among Indian investors using statistical methods such as VAR. In line with previous research demonstrating that investors' self-attribution and past performance fuel excessive trading and increased volatility, the results of the primary data analysis further confirm that investors in the Indian market exhibit notable overconfidence and loss aversion. Thus, the results obtained from primary

data analysis indicate that investors systematically overestimate their abilities and the information possessed by them while simultaneously exhibiting a stronger sensitivity to losses than to equivalent gains. These findings are consistent with prior studies exhibiting similar patterns in different markets (Kumar, 2002; Prosad et al. 2013; and Azam et al. 2022). From a theoretical perspective, OCB is linked with excessive trading activity whereas loss aversion leads to delayed loss realisation and failure to capture the maximum profit that could reap from the market. Hence behavioural biases play a significant role in the behavior of investors and partially explain deviations from the assumptions of rational market behaviour. Thus, the findings suggest the need for education programmes for investors to assist market participants in identifying and reducing these behavioural biases.

References

- Adam, K., Kuang, P., & Xie, S. (2025). Overconfidence in private information explains biases in professional forecasts. *Journal of Monetary Economics*, 103839.
- Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, 116 (1), 261-292.
- Boussaidi, R. (2013). Overconfidence bias and overreaction to private information signals: the case of Tunisia. *Procedia-Social and Behavioral Sciences*, 81, 241-245.
- Chuang, W. I., & Lee, B. S. (2006). An empirical evaluation of the overconfidence hypothesis. *Journal of Banking & Finance*, 30(9), 2489-2515.
- Con-Urbach, B., & Joakim, W. (2006). *Trading Frequency, Investor Returns, and Behavioural Biases* “ (pp. 7-18). Working paper.
- Cueva, C., Iturbe-Ormaetxe, I., Ponti, G., & Tomás, J. (2019). An experimental analysis of the disposition effect: Who and when?. *Journal of Behavioral and Experimental Economics*, 81, 207-215.
- Deaves, R., Lüders, E., & Luo, G. Y. (2009). An experimental test of the impact of overconfidence and gender on trading activity. *Review of finance*, 13(3), 555-575.
- Dervishaj, B. (2021). Psychological biases, main factors of financial behaviour-A literature review. *European Journal of Medicine and Natural Sciences*, 4(1), 27-44.
- Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets?. *Review of finance*, 9(3), 305-351.

- Frino, A., Lepone, G., & Wright, D. (2015). Investor characteristics and the disposition effect. *Pacific-Basin Finance Journal*, 31, 1-12.
- Gervais, S., & Odean, T. (2001). Learning to be overconfident. *The review of financial studies*, 14(1), 1-27.
- Glaser, M., & Weber, M. (2007). Overconfidence and trading volume. *The Geneva Risk and Insurance Review*, 32(1), 1-36.
- Gong, G., & Wright, D. (2013). Investor characteristics and the disposition effect. *SSRN Electronic Journal*.
- Hair, E., Halle, T., Terry-Humen, E., Lavelle, B., & Calkins, J. (2006). Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. *Early Childhood Research Quarterly*, 21(4), 431-454.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Pearson.
- Jaiswal, V. K. (2023). Behavioural Biases in Equity, Futures, and Options Trading: Implications for Market Efficiency. *International Journal For Multidisciplinary Research*, 5(4), 1-13.
- Kaiser, H. F. (1960). *The application of electronic computers to factor analysis*. Educational and Psychological Measurement, 20(1), 141–151.
- Kaiser, H. F. (1974). An index of factorial simplicity. *psychometrika*, 39(1), 31-36.
- Kansal, P., & Singh, S. (2018). Determinants of overconfidence bias in Indian stock market. *Qualitative Research in Financial Markets*, 10(4), 381-394.
- Lenney, E. (1977). Women's self-confidence in achievement settings. *Psychological bulletin*, 84(1), 1.
- Lewellen, W. G., Lease, R. C., & Schlarbaum, G. G. (1977). Patterns of investment strategy and behavior among individual investors. *The Journal of Business*, 50(3), 296-333.

- Lundeberg, M. A., Fox, P. W., & Punčochař, J. (1994). Highly confident but wrong: Gender differences and similarities in confidence judgments. *Journal of educational psychology*, 86(1), 114.
- Mishra, K. C., & Metilda, M. J. (2015). A study on the impact of investment experience, gender, and level of education on overconfidence and self-attribution bias. *IIMB Management Review*, 27(4), 228-239.
- Mushinada, V. N. C., & Veluri, V. S. S. (2018). Investors overconfidence behaviour at Bombay stock exchange. *International Journal of Managerial Finance*, 14(5), 613-632.
- Nofsinger, J. R. (2001). The impact of public information on investors. *Journal of Banking & Finance*, 25(7), 1339-1366.
- Oreng, M., Yoshinaga, C. E., & Eid, W. (2021). Disposition effect, demographics and risk taking. *RAUSP Management Journal*, 56(2), 217-233.
- Pompian, M. M., & Longo, J. M. (2004). A new paradigm for practical application of behavioral finance. *The Journal of Wealth Management*, 7(2), 9-15.
- Prasad, H., & Mohta, B. (2012). Loss Aversion and Overconfidence: Does Gender Matters?. *Annamalai International Journal of Business Studies & Research*, 4(1).
- Rekik, Y. M., & Boujelbene, Y. (2013). Determinants of individual investors' behaviors: Evidence from Tunisian stock market. *IOSR Journal of Business and Management*, 8(2), 109-119.
- Sahi, S. K. (2017). Psychological biases of individual investors and financial satisfaction. *Journal of Consumer Behaviour*, 16(6), 511-535.
- Seppälä, A. (2009). Behavioral biases of investment advisors-The effect of overconfidence and hindsight bias.
- Shandu, P., & Alagidede, I. P. (2024). The disposition effect and its manifestations in South African investor teams. *Review of Behavioral Finance*, 16(1), 167-185.

- Shapira, Z., & Venezia, I. (2001). Patterns of behavior of professionally managed and independent investors. *Journal of Banking & Finance*, 25(8), 1573-1587.
- Trejos, C., van Deemen, A., Rodríguez, Y. E., & Gomez, J. M. (2019). Overconfidence and disposition effect in the stock market: A micro world based setting. *Journal of behavioral and experimental finance*, 21, 61-69.
- Vega, C. (2006). Stock price reaction to public and private information. *Journal of financial economics*, 82(1), 103-133.
- Zainul, Z. R., & Suryani, I. (2021, November). Identification of Herding Behavior, Overconfidence and Risk Tolerance Based on Gender Perspective on Stock Investors in Aceh. In *6th International Conference on Tourism, Economics, Accounting, Management, and Social Science (TEAMS 2021)* (pp. 157-164). Atlantis Press.

Chapter 10

SUMMARY, FINDINGS AND CONCLUSION

10.1	Summary	136
10.2	Findings.....	142
	10.2.1 OCB in Indian Stock Market.....	142
	10.2.2 The DE in the Indian Stock Market.....	143
	10.2.3 OCB and DE in The Indian Stock Market During Different Swan Phases in Different Market Capitalisation Stock.....	145
	10.2.4 Differential Reaction to Private and Public Information	146
	10.2.5 Investor Perception Regarding OCB and DE.....	146
10.3	Conclusion.....	148

10.1 Summary

Behavioural finance highlights the role of biases in creating market anomalies, offering a more realistic framework for understanding investor actions beyond rational assumptions. It explains deviations through empirical evidence of psychological factors shaping decisions. Under the rationality assumption, no single investor can gain or lose from the market. But it is apparent from every market around the globe that winning and losing are always part of investing. Hence it is obvious that the behaviour of investors has greater role in financial decision making. Their beliefs, psychology, personality, and biases play a crucial role. Behavioural biases are unconscious beliefs that influence our decisions. Though many biases have been identified, OCB and DE are considered to be prominent biases that influence the stock market. Overconfident investors overestimate their ability to evaluate a company as a potential investment. As a result, they ignore even negative information that could threaten their investment (Pompain, 2006). The DE is the desire to hold losing investments too long (risk-seeking behaviour) and to sell winning investments too quickly (risk-avoidance behaviour) (Shefrin & Statman, 1985). This research investigates OCB and the DE in the Indian environment, encompassing various market conditions and capitalization categories. Period of the study (2014-2022) has further classified as white swan (2014-2019), grey swan (2020-2022), and black swan (2020) phases based on the predictability and certainty of the events.

This study holds considerable significance, as it tries to fill the critical gaps in understanding investor behavioural biases-OCB and DE-across white swan, grey swan, and black swan phases in the Indian stock market. By studying how market capitalization influences investor psychology and trading patterns across large-, mid-, and small-cap stocks, the study sheds new light on market segmentation effects.

This study encompasses an in-depth investigation into OCB and the DE within the Indian stock market. Utilising daily trading data from the Nifty 500 for the index and its constituent stocks from April 1, 2014, to March 31, 2022, is focused on the Indian equity market. The VAR model and SVAR model along with IRF were utilised to analyse the secondary data. The study also utilised primary data collected from the retail investors in Indian stock market, which were analysed using independent sample t-test and ANOVA.

This study's originality lies in its analysis of the dynamics of OCB and DE across the white swan, grey swan, and black swan phases as delineated by Taleb (2007). When economic developments are highly predictable and resemble historical occurrences, it is referred to as the white swan phase. When circumstances are somewhat unpredictable yet not entirely inconceivable or unfamiliar, it is referred to as the grey swan phase. When we experience rare, surprising, and very implausible situations, it is referred to as the black swan phase. This study utilises the COVID-19 pandemic as the delineating phenomenon to categorise the study era into white, grey, and black swans. The pre-pandemic period analysed (1st April 2014 to 31st December 2019), characterised by a reasonably stable social and economic environment, is referred to as the white swan phase. The pandemic era, spanning from January 1, 2020, to March 31, 2022, is designated as the grey swan phase due to the lower unpredictability of events, as individuals in this century lacked experience in such circumstances. During the initial phase of the COVID-19 pandemic, we experienced a state of panic characterised by unpredictable high mortality rates. India implemented nationwide lockdowns three times that year, an unprecedented occurrence in history. Consequently, the highly volatile and uncertain year of 2020 is regarded as the Black Swan phase of the pandemic. We also explore the dynamics of OCB and DE to analyse how market capitalisation influenced these biases in the Indian stock market. The constituent stocks of Nifty 500 were categorised as large cap, mid cap, and small cap companies based on their market capitalisation, and these biases were analysed throughout three swan phases and compared.

There were five objectives of the study. In the first objective the presence of OCB in Indian stock market were investigated over the entire study period of eight years, during the white swan period, grey swan period and black swan period. The presence of OCB was evident in the Nifty 500 during the study period. The analysis shows that OCB tends to persist during periods of low volatility and limited uncertainty, as investors attribute successful outcomes to their own skills rather than to external market factors (Statman et al., 2006). Such environments reinforce confidence in personal information, thereby sustaining overconfidence over longer durations (DHS, 1998; Odean, 1998). In contrast, during the grey swan phase, heightened market volatility and uncertainty associated with the COVID-19 pandemic encouraged speculative trading, resulting in more intense but shorter-lived overconfidence, driven partly by investors' focus on recent recovery-related information (Ghosh et al., 2025; Loang, 2025; Rahim et al., 2022). During the black swan phase, extreme unpredictability and market anxiety led investors to become increasingly loss averse, eliminating overconfidence as capital preservation and cautious trading dominated decision-making (Mazur et al., 2021; Yuwono & Elmadiani, 2021). Overall, the findings indicate that predictable and less uncertain market conditions foster overconfidence, while highly unpredictable events significantly diminish overconfidence among Indian stock market participants.

The second objective of the study was to identify and analyse the DE in the Indian stock market over white swan, grey swan and black swan phases. The analysis demonstrates that the DE intensifies and becomes increasingly pervasive as market uncertainty and volatility rise, reaching its widest and most severe manifestation during periods of extreme stress when investors across firms simultaneously face negative shocks. Heightened anxiety, panic, and emotional responses during such phases strengthen loss aversion, prompting investors to realise gains prematurely while holding on to losing positions, consistent with prospect theory (Kahneman & Tversky, 1979; Shefrin & Statman, 1985). Although the intensity of the DE is also pronounced during stable market conditions, it is primarily driven by regret avoidance and reference-dependent preferences rather than systemic fear (Weber & Camerer, 1998). Importantly, the persistence of the bias varies across phases: stable markets

allow the DE to endure longer due to the absence of strong corrective forces, whereas extreme market events compress its duration as rapid adjustments, liquidity pressures, and forced sales compel quicker behavioural correction (Hong & Stein, 1999; Daniel et al., 1998; Shiller, 2020; Baker et al., 2020). The grey swan phase represents an intermediate behavioural state, where prolonged uncertainty sustains the bias while gradual learning and adaptation reduce its intensity over time. Overall, the findings underscore that the DE is not static but evolves with changing phases and volatility.

The third objective was focused on comparing the OCB and DE in large-cap, mid-cap and small-cap stocks over different swan phases. The comparative analysis of capitalisation levels indicates that behavioural biases across different market periods are inconsistent and highly context-dependent. During the white swan period (2014–2019), OCB was prevalent in mid- and small-cap stocks, indicating speculative optimism and retail-driven euphoria in relatively stable market conditions. During the 2020 black swan period, the DE became the predominant bias in mid- and large-cap segments, while small-cap stocks exhibited a mixed trend of anxiety and speculative vigour. This alteration aligns with findings from Apostolakis et al. (2021), who presented empirical evidence that mid-cap firms transitioned to large-cap firms during the pandemic, amplifying fear-induced behaviour.

The analysis across capitalisation segments reveals distinct and context-dependent behavioural patterns over different market phases. Large-cap stocks consistently exhibited the dominance of the DE across all periods, reflecting heightened loss aversion and cautious trading behaviour supported by stronger information flows, liquidity, and institutional participation, particularly during periods of uncertainty. This stability aligns with evidence that investors in large-cap firms are more reluctant to realise losses and tend to respond conservatively under stress. In contrast, mid-cap stocks demonstrated the highest behavioural volatility, with overconfidence prevailing during stable market conditions, a sharp shift towards the DE during extreme uncertainty, and a balanced coexistence of biases during recovery phases. This pattern underscores the sensitivity of mid-cap investors to changing market conditions, as optimism-driven behaviour gives way to loss aversion under stress and

partially reverts during periods of gradual recovery. Small-cap stocks exhibited a more sentiment-driven and cyclical behavioural response, characterised by elevated overconfidence during stable and recovery phases and heightened loss aversion during crisis periods. Over the long term, however, small-cap stocks showed a movement towards greater caution, with diminishing overconfidence and a substantial proportion of unaffected stocks, suggesting behavioural learning and increased investor vigilance. Overall, the findings confirm that behavioural biases vary systematically across capitalisation levels, shaped by differences in investor composition, information availability, liquidity, and event uncertainty.

The fourth objective was to investigate the overreaction to private information and underreaction to public information in the Indian stock market. The findings reveal a clear asymmetry in how the Indian stock market responds to different types of information. Investors place greater weight on information they perceive as private, leading to stronger trading activity and more pronounced price movements, while publicly available information generates weaker and short-lived reactions. This behaviour is consistent with the overconfidence framework, which suggests that investors overestimate the value of their own information and underestimate widely shared signals (Daniel et al., 1998). As a result, private signals tend to trigger excessive trading and sustained price reactions, whereas public signals are initially overreacted to but later corrected, reflecting temporary mispricing (De Bondt & Thaler, 1985). Overall, the dominance of private information in shaping trading decisions highlights the role of overconfidence in distorting prices and trading behaviour, with important implications for market efficiency and investor outcomes in an emerging market such as India (Boussaidi, 2013).

The fifth objective was to explore the disparities between investors' perceived biases and their actual trading habits. According to the report, investors in the Indian stock market are vulnerable to both DE and OCB. OCB is more visible among the financial advisors as they believe they are better at making above average decisions. Individual investors are particularly affected by the DE, suggesting loss aversion in their financial actions. The study also studied the influence of gender and investment

experience in shaping the DE and OCB. The DE were substantially evident among the investors with an intermediate level of experience, and male investors exhibited a significantly higher level of bias than the female group. The degree of OCB was increasing up to a level with an increase in investment experience and it has fallen again among highly experienced investors. In line with Barber and Odean's (2001) findings, male investors were more overconfident than female investors. Financial advisors were shown to be more satisfied with their investments than individual investors. So, studying the biases among Indian investors also complements the conclusions revealed by the secondary data analysis that the Indian stock market is affected by the DE and OCB. The presence of both biases is reflected in investor perception as well as in their actual trading activity in the stock market.

10.2 Findings

The findings of the research are discussed under this section. Findings are reported objectively in five sections.

10.2.1 OCB in Indian Stock Market

- The presence of OCB was evident in the Nifty 500 during the study period of 1st April 2014 to 31st March 2022 from the VAR analysis.
- During the white swan period, the OCB is observed at a moderate level, reaching a peak of only 2.7 percent, but persists for almost 40 trading days, which is the longest among all other phases. This may be attributed to the low volatility/return environment observed during this period. This environment is prone to self-attribution bias, where investors tend to attribute their successful investments to their skills rather than to other external or market-related factors (Statman et al., 2006). The persistence in OCB is also increased because, according to DHS (1998), individuals tend to be overconfident about their own information when uncertainty is restricted. This may be attributed to the fact that when individuals face low levels of uncertainty, they develop excessive confidence in their personal views. This supports the views proposed by Odean (1998), who argued how a tranquil market environment gives precedence to OCB.

- In the grey swan phase, the length of OCB is merely 20 days, compared to 40 days in the white swan phase. The severity of the bias is greater during the grey swan phase (3.2%). The uncertainty caused by the COVID-19 pandemic led to significant volatility in the stock market, which highlighted the speculative trading occurring in the market (Ghosh et al., 2025). This suggested that, during this period, investors were engaging in overconfident trading, believing they could profit from speculative activities by capitalizing on the significant volatility in the Indian stock market (Loang, 2025). The pronounced intensity of the bias might be ascribed to availability bias (Rahim et al., 2022), wherein investors favored the most recent positive recovery announcements during trading, as they perceived the recovering market as an opportunity for profit. The persistent fears of the pandemic have resulted in market trading corrections, leading to a reduced duration throughout this era.
- The black swan phase of event unpredictability and uncertainty instilled anxiety in the Indian stock market at the onset of the coronavirus epidemic, as it observed the collapse of other markets (Mazur et al., 2021). The increased unpredictability and volatility rendered investors loss averse (Yuwono & Elmadiani, 2021), resulting in the absence of OCB in the Indian stock market. Investors transitioned to capital preservation and rational trading during this period.
- The study clearly indicates that predictable times and phases of less uncertainty foster OCB, while extremely unpredictable events diminish the overconfidence of Indian stock market participants. Therefore, the study suggests that investors should exercise caution regarding their overconfident behaviour during periods of lower volatility, as overtrading may lead to reduced portfolio returns.

10.2.2 The DE in the Indian Stock Market

- The study reveals that the DE exhibits varying behaviours across different periods.
- The number of stocks affected by the DE increases from the white swan phase (129 stocks) to the grey swan phase (179 stocks) and reaches its maximum during the black swan phase (191 stocks). This pattern suggests that as market uncertainty

and volatility intensify, behavioural biases become more widespread across securities. During periods of extreme stress, such as the initial outbreak of the COVID-19 pandemic, investors of various firms are simultaneously exposed to negative shocks, amplifying loss aversion at the market level. Consequently, the DE extends beyond firm-specific fundamentals and becomes more pervasive.

- The black swan phase (18.23%) has the highest peak rate for the DE, followed by the white swan phase (15.73%) and the grey swan phase (13.70%). The extraordinarily high intensity observed during the black swan era can be attributed to acute anxiety, panic, and heightened emotional reactions provoked by unparalleled uncertainty and sudden market downturns. Prospect theory posits that loss aversion intensifies when outcomes are perceived as losses amid great uncertainty, resulting in aggressive liquidation of profitable equities and an aversion to acknowledging losses (Kahneman & Tversky, 1979; Shefrin & Statman, 1985).
- The white swan phase is marked by market conditions that are generally steady, yet the disposition impact still shows a very high peak intensity. This shows that investors still want to make money and avoid losing money, even when things are peaceful. This is because they want to avoid feeling regret and because their preferences depend on what they see (Weber & Camerer, 1998). The decreasing intensity during the grey swan phase may be due to investors' adaptive behaviour, as they slowly got used to the uncertainty caused by the pandemic and started using more cautious and varied trading tactics (Lo, 2004).
- The DE lasts the longest during the white swan phase (20 days), the second longest during the grey swan phase (19.5 days), and the shortest during the black swan phase (17 days). This inverse correlation between intensity and duration signifies varying behavioural dynamics across regimes. In stable markets, the lack of major corrective shocks lets behavioural biases last longer because investors face less pressure to rebalance portfolios or liquidate positions (Hong & Stein, 1999; DHS, 1998).

- The DE is very strong during the black swan phase, but it doesn't last as long because the market adjusts quickly, forcing sales, margin calls, and liquidity problems, which make investors change their positions more quickly (Shiller, 2020; Baker et al., 2020). The grey swan phase is a middle ground where long-term uncertainty keeps the bias going, but regular updates of knowledge and changes in policy slowly reduce its strength.

10.2.3 OCB and DE in The Indian Stock Market During Different Swan Phases in Different Market Capitalisation Stock

- The comparative analysis of capitalisation levels indicates that behavioural biases across different market periods are inconsistent and highly context-dependent. During the white swan period (2014–2019), OCB was prevalent in mid- and small-cap stocks, indicating speculative optimism and retail-driven euphoria in relatively stable market conditions. During the 2020 black swan period, the DE became the predominant bias in mid- and large-cap segments, while small-cap stocks exhibited a mixed trend of anxiety and speculative vigour. This alteration aligns with findings from Apostolakis et al. (2021), who presented empirical evidence that mid-cap firms amplified fear-induced behaviour during the pandemic period.
- Throughout the grey swan period (2020–2022), large-cap stocks exhibited the dominance of DE, mid-cap stocks displayed a relatively balanced mix of biases, and small-cap stocks leaned towards renewed overconfidence, reflecting varied recovery trends across market groups. This phase demonstrates the gradual restoration of investor sentiment to its normative state, consistent with the impulse response findings on volatility by Chung & Chuwonganant (2023), which indicated that liquidity and price efficiency were re-established post-pandemic, particularly in markets characterised by human interaction and structured trading settings.
- Throughout the period from 2014 to 2022, large-cap stocks demonstrated the most excellent behavioural stability, mid-cap stocks remained susceptible to

overconfidence, while small-cap stocks showed a long-term trend towards caution, characterised by minimal overconfidence and a significant proportion of unbiased stocks. The behavioural shift in small-cap stocks is further supported by Yong (2015), who demonstrated that regulatory constraints and increased investor vigilance ultimately tempered speculative surges in smaller markets.

- Behavioural asymmetries across capitalisation levels are evident from analysis: small-cap shares exhibit greater volatility and more extreme outliers, while larger-cap shares show stable, consistent performance. The findings corroborate the behavioural biases identified in this study, particularly the dominance of OCB in small-cap stocks during stable periods and the DE in large-cap stocks during crises (Oraon, 2025).

10.2.4 Differential Reaction to Private and Public Information

The Structural VAR estimate shows significant asymmetry in how the Indian stock market processes private and public information. Indicating a substantial contemporaneous volume response to private information shocks, while public information shocks do not produce such a response. Returns respond significantly to public information, but the reaction to private information is minimal. These results align with the theoretical ideas proposed by DSH (1998), which suggest that overconfident investors tend to overvalue private signals and undervalue public signals because they believe they have superior information.

10.2.5 Investor Perception Regarding OCB and DE

- The influence of investment experience on DE was tested using ANOVA, and the results showed an increase in DE with experience up to a certain level, then a decrease in bias. Investors with less than 1 year of experience score 3.07, those with 1-3 years score 3.17, those with 4-6 years score 3.27, and those with more than 6 years score 3.22. The findings suggest that investment biases tend to increase with experience, contrary to Feng and Seashole (2005). However, among individuals with more than six years of experience, biases decrease, indicating that while experienced investors may still be prone to biases, they develop strategies

to minimise their impact, as noted by Jaiswal (2023). While this pattern suggests a rising bias with experience, the Tukey post hoc test reveals that the only statistically significant difference is between investors with less than 1 year of experience and those with 4-6 years ($p = 0.031$), indicating that the DE is significantly higher among intermediate-level investors than among beginners. No significant differences were observed among the other groups, indicating that the DE does not vary substantially across the remaining experience categories.

- The Independent Samples t-Test results indicate a significant difference in the DE between individual investors and financial advisors. Individual investors exhibit a higher mean score compared to financial advisors, suggesting they are more prone to the DE. Financial advisors, likely due to their professional expertise and experience, manage the DE better than individual investors. This finding aligns with previous research suggesting that professional investors tend to make more rational decisions, whereas retail investors are more susceptible to the DE (Shapira & Venezia, 2001).
- The ANOVA test results revealed that gender affects the DE. Male investors are more prone to DE than female investors and the “prefer not to say” group in India.
- Financial advisors showed greater satisfaction in their investment decisions compared to retail investors. Retail investors may have made less-than-ideal trading decisions due to the DE, characterised by the tendency to hold losing stocks too long and sell winning stocks too quickly, thereby reducing satisfaction with their past investments.
- The overall average score (3.18) of statements measuring OCB indicates a moderate presence of OCB, where investors may overestimate their knowledge and ability to predict market movements, potentially leading to excessive risk-taking or misjudgement in investment decisions.
- The presence of OCB was greater among the financial advisors rather than among retail investors. The findings suggest that, despite their expertise, financial advisors overestimate their ability to predict market movements, reinforcing the

notion that professional experience can sometimes amplify rather than mitigate overconfidence. This finding contradicts Seppala (2009), who found that professional expertise mitigated OCB. This contradiction may be due to market differences.

- These findings suggest that overconfidence increases with experience, particularly in the early to moderate stages. However, the effect diminishes as experience grows, aligning with the Dunning-Kruger effect, in which investors with moderate experience may overestimate their abilities before gaining a more realistic self-assessment with further experience, decisions, and financial outcomes.
- These findings align with previous behavioural finance research, which consistently shows that males are more overconfident in financial decisions than females (Barber & Odean, 2001)
- While private information plays a role in investors' strategies, their reliance on it is not overwhelmingly strong. Additionally, the average score for overreaction to private information is 3.08, further supporting the presence of OCB, where investors tend to overreact to private information while underreacting to public information, potentially leading to suboptimal investment decisions (Chuang & Lee, 2006).
- The results of trading data analysis using VAR models and analysis of investor perceptions collected through questionnaire complements each other that the presence of OCB and DE are evident in the stock market and investor behaviour. So the overconfident behaviour of investors are evident from the stock market behaviour and the primary data collected confirms the influence of OCB and DE in investor decision making.

10.3 Conclusion

This research aimed to explore the impact of behavioural biases on decision-making in the Indian stock market during various market phases. The results clearly indicate that the Indian stock market is largely affected by OCB and DE, and that these biases

do not remain constant. Rather, they vary depending upon the market phase, level of uncertainty, and characteristics of both companies and investors.

The results of the phase-wise analysis reveal that OCB remains constant during predictable and low volatility market conditions, where investors tend to build strong confidence in their own judgment and private beliefs (Statman et al., 2006; Daniel et al., 1998; Odean, 1998). When the level of uncertainty increases but remains within manageable limits, OCB becomes more extreme but temporary, as volatility and market corrections restrict its duration (Ghosh et al., 2025; Rahim et al., 2022). However, when the level of uncertainty reaches extreme levels, OCB becomes negligible, and investors become more concerned with preserving their capital as loss aversion dominates (Mazur et al., 2021; Yuwono & Elmadiani, 2021).

By contrast, the DE portrays a different behavioural pattern. As uncertainty increases, the phenomenon of investors holding losing stocks and selling winning stocks early becomes more prevalent, especially during periods of extreme market stress, when investors across firms are confronted with similar adverse shocks. Although the strength of the DE reaches its peak during extreme events because of increased levels of anxiety and emotional behaviour, in stable markets, the DE is also very strong, primarily driven by regret aversion and reference-dependent preferences (Kahneman & Tversky, 1979; Shefrin & Statman, 1985; Weber & Camerer, 1998). It is pertinent to note that the DE persists for the longest duration in stable markets and for the shortest duration during extreme events, depending upon market pressure, liquidity constraints, and the rate at which investors are compelled to make adjustments in their portfolios (Hong & Stein, 1999; Shiller, 2020; Baker et al., 2020).

The results of the comparison over capitalization levels further support the notion that biases are context-dependent. During the stable phase, overconfidence was more evident in mid-cap and small-cap stocks, while during the phase of extreme uncertainty, loss aversion dominated investor behaviour, especially in mid-cap and large-cap stocks. During the recovery phase, the behaviour of investors started to differ once again: large-cap stocks remained cautious due to the DE, mid-cap stocks were characterised by a combination of biases, and small-cap stocks reverted to their

preference for overconfidence. Over the black swan phase of higher uncertainty, large-cap stocks were highly loss averse, mid-cap stocks remained prone to DE, and small-cap stocks became more overconfident than being loss averse, particularly due to their higher participation by retail investors.

The study also points out the significant asymmetry in the processing of information by Indian investors. Investors give more significance to the information they consider private, while less significance to the information that is public. This results in overtrading and price distortions, as the private information leads to market reactions, while the public information gets adjusted over time (Daniel et al., 1998; De Bondt & Thaler, 1985). This practice indicates inefficiency in the market and the dangers of overtrading due to overconfidence, especially in the case of an emerging market like India (Boussaidi, 2013).

Finally, the analysis of investor perceptions and actual trading behaviour shows that there are distinct differences among various groups of investors. Both OCB and the DE are present among Indian investors, but the degree of these biases differs among various groups of investors. OCB is more prevalent among financial advisors, who are highly confident about their superior decision-making abilities, while individual investors are more prone to the DE, which is a manifestation of their loss aversion. Male investors are more overconfident than female investors, as predicted by Barber and Odean (2001). Experience has a non-linear effect on OCB and DE, which rises with experience but then falls for highly experienced investors (Jaiswal, 2023). Similarly, financial advisors are more satisfied with their investment decisions than individual investors.

In conclusion, the research has managed to prove that the behavioural biases are very much entrenched in the Indian stock market, and these biases are not only evident in the perception of the investors but also in their trading activities. The presence of OCB and DE in the Indian stock market, regardless of the market phases, sizes, and types of investors, highlights the need for investor education and effective behavioural models to counter irrational decision-making.

Chapter 11

RECOMMENDATIONS AND SCOPE FOR FUTURE RESEARCH

11.1	Introduction	151
11.2	Recommendations	151
	11.2.1 Recommendations to Investors.....	151
	11.2.2 Recommendations for Financial Advisors	152
	11.2.2 Recommendations to Regulators and Policy Makers.....	152
11.3	Implications of the study.....	153
	11.3.1 Implications to Investors	153
	11.3.2 Implications to Financial Advisors and Share Brokers	153
	11.3.3 Implications to Society.....	153
	11.3.4 Implications to Academicians	154
11.4	Scope for Future Study	154

11.1 Introduction

The research questions set for the study were answered with the help of various analysis tools. The study's findings are relevant enough to provide recommendations to various stakeholders. A study becomes worthy only if it can give insights to the stakeholders to correct their biases in decision-making and move to a more rational side. This section gives recommendations to the stakeholders, discusses the implications of the study and opens the road for future researchers.

11.2 Recommendations

11.2.1 Recommendations to Investors

The OCB and DE significantly influence the investor behaviour in the Indian stock market. Its effect varies with market predictability, market cap, gender and investment experience. Overconfidence was observed to persist during stable and predictable market phases, while loss aversion and disposition-driven behaviour intensified during periods of extreme uncertainty.

Based on these findings, investors are encouraged to adopt disciplined investment strategies that emphasise long-term objectives rather than short-term market movements. As investors have shown excessive trading due to OCB during stable periods, they should limit frequent portfolio diversification and formulate predefined entry-exit criteria and adopt periodic portfolio reviews.

The study has reported increased DE among retail investors; hence, they should actively use stop-loss mechanisms, objective performance benchmarks, and rule-based rebalancing strategies to counter emotional decision-making during volatile market phases.

Furthermore, as the research highlights greater susceptibility to biases among investors with intermediate trading experience, investors in this category should be especially cautious of overestimating their skill and market timing ability. Regular self-evaluation and performance audits can help identify bias-driven patterns and reduce repeated decision errors.

11.2.2 Recommendations for Financial Advisors

While experience and expertise contribute to confidence, being overconfident is harmful to financial advisors. They are advised to incorporate behavioural diagnostics in their decisions and advice.

As the influence of gender and investment experience on DE and OCB is observed among Indian investors, financial advisors are recommended to provide tailored financial advice to different gender groups and experienced investors.

Financial advisors should be conscious of the influence of their personal beliefs in meeting client-specific financial goals.

11.2.3 Recommendations to Regulators and Policy Makers

The study revealed the persistence of OCB and De in the Indian stock market, which contributed to excessive trading and price distortions differently during stable and uncertain times. This highlights the need for regulatory frameworks acknowledging behavioural influences rather than assuming a perfect market with rational investors.

Rather than focusing solely on technical market knowledge, regulators should integrate the dimensions of common behavioural biases too.

It is advised to adopt surveillance mechanisms to identify the excessive and irrational trading patterns leading to market inefficiencies.

Policy makers may consider collaborative initiatives with exchanges, brokerage firms, and academic institutions to design decision support tools and behavioural nudges engaging rational investment behaviour.

11.3 Implications of the study

The following part of the report discusses the implications of the current research to investors, financial advisors, society and academicians.

11.3.1 Implications to Investors

The findings of the study have important implications for understanding investor behaviour in the Indian stock market, particularly with respect to the role played by uncertainty and market stress. The persistence of overconfidence bias during stable and moderately uncertain periods implies that investors tend to overestimate their informational advantage and decision-making ability when market conditions appear predictable. This behavioural tendency challenges the assumption of rational information processing and thus supports the possibility that even in relatively calm environments, market efficiency may be compromised. The results help the investors to recognise the overtrading tendency during relatively stable periods and understand their tendency of premature selling of winners and holding losers. The study also helps to align their behavioural responses, based on the market cap segment they predominantly trade in.

11.3.2 Implications to Financial Advisors and Share Brokers

The findings of this study will assist financial advisors in providing investors with risk alerts during all economic phases. They get insights on advising clients with stop-loss implementation and the execution of portfolio rebalancing. This study cautions that investors may overemphasize private information, which advisors should bring to their attention while making decisions. By analysing the behaviour of OCB and DE across different levels of certainty, they may discern the discrepancies between client intentions and their actual trading behaviour. Collectively, they can enhance the quality of customer recommendations by comprehending the facets of OCB and DE.

11.3.3 Implications to Society

The study provides society with insights for improved investment decisions. By comprehending the impact of OCB and DE on investment decisions, one can mitigate

errors arising from emotional factors. This will facilitate healthy savings and investment practices. This study provides insights into policy frameworks, hence enhancing trust in the integrity of information inside capital markets. This study highlights the influence of disinformation on retail financial decisions, which can mitigate its adverse effects. It enhances societal financial literacy and behavioural awareness.

11.3.4 Implications to Academicians

This is the first study to compare and analyse the OCB and DE over several swan phases, giving researchers and academicians more insight into how the OCB and DE operate during phases with varying predictability and volatility. This study also elucidates the dynamics of these biases across stocks with different market capitalizations.

11.4 Scope for Future Study

- Future researchers can consider the inclusion of institutional investors to compare the behavioural patterns across investor classes.
- May incorporate behavioural experiments or psychometric assessments to capture deeper cognitive and emotional processes behind trading decisions.
- Future research may examine whether the COVID-19 pandemic has made a lasting change in investors' behavioural biases and decision-making patterns in the post-pandemic period.

BIBLIOGRAPHY

- Adam, K., Kuang, P., & Xie, S. (2025). Overconfidence in private information explains biases in professional forecasts. *Journal of Monetary Economics*, 103839.
- Ahn, Y. (2022). The anatomy of the disposition effect: which factors are most important?. *Finance research letters*, 44, 102040.
- An, L., Engelberg, J., Henriksson, M., Wang, B., & Williams, J. (2024). The portfolio-driven disposition effect. *The Journal of Finance*, 79(5), 3459-3495.
- Apostolakis, G. N., Floros, C., Gkillas, K., & Wohar, M. (2021). Political uncertainty, COVID-19 pandemic and stock market volatility transmission. *Journal of International Financial Markets, Institutions and Money*, 74, 101383.
- Åqvist, D. (2025). The Impact of Liquidity on Stock Price Fluctuations in Sweden's Small-, Mid-, and Large-cap Stocks Surrounding Interim Reports.
- Arora, R., & Rajendran, M. (2023). Moored minds: An experimental insight into the impact of the anchoring and disposition effect on portfolio performance. *Journal of Risk and Financial Management*, 16(8), 349.
- Asnawi, S. K., Siagian, D., Alzah, S. F., & Halim, I. (2022). Does disposition effect appear on investor decision during the COVID-19 pandemic era: Empirical evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, 9(4), 53-62.
- Azam, M. Q., & Baig, M. A. (2023). Does Overconfidence Bias Exist in the Indian Stock Market? An Empirical Analysis Using VAR Environment. *Finance India*, 37(2), 627–644. Retrieved from <https://www.financeindia.org/data/2023/FI372/FI-372-CP07.pdf>

-
- Azam, M. Q., Hashmi, N. I., Hawaldar, I. T., Alam, M. S., & Baig, M. A. (2022). The COVID-19 pandemic and overconfidence bias: The case of cyclical and defensive sectors. *Risks*, 10(3), 56.
- Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The review of asset pricing studies*, 10(4), 742-758.
- Ball, R., Hofmann, C., & Löffler, A. (2025). The Role of Public Information in Capital Markets with Investors of Unknown Risk Attitudes. *European Accounting Review*, 34(4), 1529-1553.
- Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The quarterly journal of economics*, 116(1), 261-292.
- Barber, B. M., & Odean, T. (2001). The internet and the investor. *Journal of Economic Perspectives*, 15(1), 41-54.
- Barber, B. M., Lee, Y. T., Liu, Y. J., & Odean, T. (2007). Is the aggregate investor reluctant to realise losses? Evidence from Taiwan. *European Financial Management*, 13(3), 423-447.
- Barberis, N., & Xiong, W. (2007). Realization utility: a psychology-based model of investor trading behavior. *Available at SSRN 1008169*.
- Barberis, N., & Xiong, W. (2009). What drives the disposition effect? An analysis of a long-standing preference-based explanation. *the Journal of Finance*, 64(2), 751-784.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of financial economics*, 49(3), 307-343.
- Barreto, P. L. D. A., Barbedo, C. H. D. S., & Camilo-da-Silva, E. (2023). Disposition Effect: Brazilian Investors' Behavior during the Covid-19 Pandemic. *BBR. Brazilian Business Review*, 20(1), 1-17.

- Batool, Z., & Akhtar, H. (2023). Market Returns Under Volatility, Liquidity, Information Asymmetry, Disposition Effect During Covid. *Pakistan Journal of Social Research*, 5(01), 157-169.
- Berger, D. (2022). Investor sentiment: A retail trader activity approach. *Review of Accounting and Finance*, 21(2), 61-82.
- Bernile, G., Bonaparte, Y., & Delikouras, S. (2025). Stock market experience and investor overconfidence: Do investors learn to be overconfident?. *Journal of Banking & Finance*, 174, 107431.
- Bharandev, S., & Rao, S. N. (2019). Disposition effect at the market level: evidence from Indian stock market. *Review of Behavioral Finance*, 12(2), 69-82.
- Bhatia, A., Chandani, A., & Divekar, R. (2025). Impact of Overconfidence Bias on Perceived Market Efficiency—The Mediating Role of Investment Decision-Making of Indian Individual Investors. In *Securing the Future through Sustainability, Health, Education, and Technology* (pp. 98-105). Routledge.
- Boussaidi, R. (2013). Overconfidence bias and overreaction to private information signals: the case of Tunisia. *Procedia-Social and Behavioral Sciences*, 81, 241-245.
- Boussaidi, R. (2022). Implications of the overconfidence bias in presence of private information: Evidence from MENA stock markets. *International Journal of Finance & Economics*, 27(3), 3660-3678.
- Bouteska, A., & Regaieg, B. (2020). Loss aversion, overconfidence of investors and their impact on market performance evidence from the US stock markets. *Journal of Economics, Finance and Administrative Science*, 25(50), 451-478.
- Brettschneider, J., Burro, G., & Henderson, V. (2021). Wide Framing Disposition Effect: An Empirical Study. *Journal of Economic Behavior & Organization*, 185, 330-347.

-
- Briere, M., Calamai, T., Di Giansante, F., Huynh, K., & Novelli, R. (2023). Behavioral Biases Among Retail and Institutional Investors. *Available at SSRN 4467369*.
- Calvet, L. E., Campbell, J. Y., & Sodini, P. (2009). Measuring the financial sophistication of households. *American economic review*, 99(2), 393-398.
- Chakraborty, I. (2023). Impact of Covid-19 on the Stock Market and Corporate Firms in India. In *Exploring What Drives Indian Stock Market During Covid-19: Fads or Fundamentals* (pp. 17-33). Singapore: Springer Nature Singapore.
- Chuang, W. I., & Lee, B. S. (2006). An empirical evaluation of the overconfidence hypothesis. *Journal of Banking & Finance*, 30(9), 2489-2515.
- Chung, K. H., & Chuwonganant, C. (2012). Uncertainty, Fear, and Liquidity. *Shared Growth and Sustainable Development*, 352.
- Con-Urbach, B., & Joakim, W. (2006). *Trading Frequency, Investor Returns, and Behavioural Biases* “ (pp. 7-18). Working paper.
- Cueva, C., Iturbe-Ormaetxe, I., Ponti, G., & Tomás, J. (2019). An experimental analysis of the disposition effect: Who and when?. *Journal of Behavioral and Experimental Economics*, 81, 207-215.
- Danbolt, J., Eshraghi, A., & Lukas, M. (2022). Investment transparency and the disposition effect. *European Financial Management*, 28(3), 834-865.
- Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. *the Journal of Finance*, 53(6), 1839-1885.
- De Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact?. *The Journal of finance*, 40(3), 793-805.
- Deaves, R., Lüders, E., & Luo, G. Y. (2009). An experimental test of the impact of overconfidence and gender on trading activity. *Review of finance*, 13(3), 555-575.

- Deaves, R., Lüders, E., & Schröder, M. (2010). The dynamics of overconfidence: Evidence from stock market forecasters. *Journal of Economic Behavior & Organization*, 75(3), 402-412.
- Dervishaj, B. (2021). Psychological biases, main factors of financial behaviour-A literature review. *European Journal of Medicine and Natural Sciences*, 4(1), 27-44.
- Dev, S. M., & Sengupta, R. (2020). Covid-19: Impact on the Indian economy. *Indira Gandhi Institute of Development Research, Mumbai April*, 1-43.
- Dhar, R., & Zhu, N. (2006). Up close and personal: Investor sophistication and the disposition effect. *Management science*, 52(5), 726-740.
- Dhingra, B., & Yadav, M. (2024). *An empirical analysis of overconfidence behaviour in the Indian ETF market*. *International Journal of Revenue Management*, 14(1), 72-94.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427-431. <https://doi.org/10.2307/2286348>
- Dierick, N., Heyman, D., Inghelbrecht, K., & Stieperaere, H. (2019). Financial attention and the disposition effect. *Journal of Economic Behavior & Organization*, 163, 190-217.
- Du, N., & Budescu, D. V. (2007). Does past volatility affect investors' price forecasts and confidence judgements?. *International Journal of Forecasting*, 23(3), 497-511.
- Eyvazloo, R., Raei, R., & Rezaei, F. (2024). Stock Market Entry Timing and Retail Investors' Disposition Effect. *Financial Research Journal*, 26(4), 940-962.
- Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets?. *Review of finance*, 9(3), 305-351.

-
- Feng, L., & Seasholes, M. S. (2005). Do investor sophistication and trading experience eliminate behavioral biases in financial markets?. *Review of finance*, 9(3), 305-351.
- Frino, A., Lepone, G., & Wright, D. (2015). Investor characteristics and the disposition effect. *Pacific-Basin Finance Journal*, 31, 1-12.
- Ganesh, R., Naresh, G., & Thiyagarajan, S. (2020). Manifesting overconfidence bias and disposition effect in the stock market. *International Journal of Business and Economics*, 19(3), 257-284.
- Ganesh, R., Thiyagarajan, S., Vasudevan, G., & Naresh, G. (2023). Investors' Overconfidence in the Stock Market. *Copernican Journal of Finance & Accounting*, 12(4), 108–122. <https://apcz.umk.pl/CJFA/article/download/45188/36087>
- Gervais, S., & Odean, T. (2001). Learning to be overconfident. *The review of financial studies*, 14(1), 1-27.
- Ghosh, I., Chaudhuri, T. D., Sarkar, S., Mukhopadhyay, S., & Roy, A. (2025). Macroeconomic shocks, market uncertainty and speculative bubbles: a decomposition-based predictive model of Indian stock markets. *China Finance Review International*, 15(1), 166-201.
- Glaser, M., & Weber, M. (2007). Overconfidence and trading volume. *The Geneva Risk and Insurance Review*, 32(1), 1-36.
- Glaser, M., Langer, T., & Weber, M. (2005). Overconfidence of professionals and lay men: Individual differences within and between tasks?. *None*. SONDERFORSCHUNGSBereich 504 WORKING PAPER SERIES
- Goetzmann, W. N., & Massa, M. (2003). Disposition matters: Volume, volatility and price impact of a behavioral bias. Working paper. *National bureau of Economic Research*. DOI 10.3386/w9499

- Gong, G., & Wright, D. (2013). Investor characteristics and the disposition effect. *SSRN Electronic Journal*.
- Goossens, J. T., & Knoef, M. (2020). Preferences, disposition effect and COVID-19. *Academic Final Report*, 40.
- Goossens, J. T., & Knoef, M. (2022). COVID-19 Crisis: Do Extreme Events Affect Preferences and Trading Behavior?. *Available at SSRN 4109220*.
- Gorzon, D., & von Nitzsch, R. (2025). Behavioral performance attribution of retail investors' portfolio returns. *Financial Markets and Portfolio Management*, 1-32.
- Goswami, A., Kumar, M., & Sharma, R. (2022). An Empirical Investigation of the Indian Stock Market's Overconfidence Tendency. *Journal of Emerging Technologies and Innovative Research*, 9(2), 363–369. <https://www.jetir.org/papers/JETIR2202045.pdf>
- Greenwald, A. G. (1980). The totalitarian ego fabrication and revision of personal history. *American Psychologist*, 35(7), 603–618
- Gupta, K., Das, S., & Gupta, K. (2022). Volatility in Indian stock markets during COVID-19: An analysis of equity investment strategies. *International Journal of Business Analytics (IJBAN)*, 9(1), 1-16.
- Gupta, R., Nel, J., & Pierdzioch, C. (2023). Investor confidence and forecastability of US stock market realized volatility: Evidence from machine learning. *Journal of Behavioral Finance*, 24(1), 111-122.
- Gupta, S. (2025). A Study on Behavioural Biases Influencing Investment Decisions Among Retail Investors in Bengaluru City. *The International Journal of Research and Scientific Innovation*, 12(3), 1914-1925.
- Hair, E., Halle, T., Terry-Humen, E., Lavelle, B., & Calkins, J. (2006). Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. *Early Childhood Research Quarterly*, 21(4), 431-454.

-
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Pearson.
- He, Z. L. (2022). An Evolutionary Theory of Overconfidence and Loss Aversion in Adaptive Markets. *Available at SSRN 4115680*.
- Hong, H., & Stein, J. C. (1999). A unified theory of underreaction, momentum trading, and overreaction in asset markets. *The Journal of finance*, 54(6), 2143-2184.
- Jain, N., & Kesari, B. (2021). Sharing the economic torment due to covid-19 and pertinent behavioural biases on financial risk resilience ability of security market investors. *Psychology and Education*, 58(2), 1073-1091.
- Jaiswal, V. K. (2023). Behavioural Biases in Equity, Futures, and Options Trading: Implications for Market Efficiency. *International Journal For Multidisciplinary Research*, 5(4), 1-13.
- Jin, X., Li, H., Yu, B., & Zheng, Y. (2023). How does the COVID-19 pandemic change the disposition effect in fund investors?. *Pacific-Basin Finance Journal*, 81, 102119.
- Jin, X., Li, R., & Zhu, Y. (2021). Could social interaction reduce the disposition effect? Evidence from retail investors in a directed social trading network. *Plos one*, 16(2), e0246759.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 363-391.
- Kaiser, H. F. (1960). *The application of electronic computers to factor analysis. Educational and Psychological Measurement*, 20(1), 141–151.
- Kaiser, H. F. (1974). An index of factorial simplicity. *psychometrika*, 39(1), 31-36.
- Kajol, M. K. (2020). Factors affecting disposition effect in equity investment: a social network analysis approach (Doctoral dissertation, Assam University).

- Kanojia, S., Singh, D., & Goswami, A. (2018). An empirical analysis of the factors influencing individual investors in the Indian Stock market. *Journal of Business and Management*, 20(3), 30-37.
- Kansal, P., & Singh, S. (2018). Determinants of overconfidence bias in Indian stock market. *Qualitative Research in Financial Markets*, 10(4), 381-394.
- Kao, Y. S., Chuang, H. L., & Ku, Y. C. (2020). The empirical linkages among market returns, return volatility, and trading volume: Evidence from the S&P 500 VIX Futures. *The North American Journal of Economics and Finance*, 54, 100871.
- Kesuma, W., Ekaputra, I. A., & Chalid, D. A. (2022). Individual investor attention to stock split and the disposition effect. *Review of Behavioral Finance*, 14(5), 701-717.
- Khan, M. N., Fifield, S. G., & Power, D. M. (2024). The impact of the COVID 19 pandemic on stock market volatility: evidence from a selection of developed and emerging stock markets. *SN Business & Economics*, 4(6), 63.
- Kumar, J., & Prince, N. (2022). Overconfidence bias in the Indian stock market in diverse market situations: an empirical study. *International Journal of System Assurance Engineering and Management*, 13(6), 3031-3047.
- Kumar, J., & Prince, N. (2022). *Overconfidence bias in the Indian stock market in diverse market situations: an empirical study. International Journal of System Assurance Engineering and Management*, 13, 3031–3047.
- Kumar, M., Pandey, N., & Tripathi, A. P. (2025). Does the Bias Towards Under and Overconfidence Affect Investment Decisions?: Proof From India. *Unveiling Investor Biases That Shape Market Dynamics*, 87-122. IGI Global Scientific Publishing.
- Kumar, S., & Sabharwal, A. (2024). An Evaluation of Large Cap, Mid Cap, and Small Cap Mutual Funds: Return, Risk, and Investor Considerations. *International Journal of Banking, Risk & Insurance*.

-
- Kuranchie-Pong, R., & Forson, J. A. (2022). Overconfidence bias and stock market volatility in Ghana: testing the rationality of investors in the Covid-19 era. *African Journal of Economic and Management Studies*, 13(1), 147-161.
- Leal, C. C., Loureiro, G., & Armada, M. J. R. (2018). Selling winners, buying losers: Mental decision rules of individual investors on their holdings. *European Financial Management*, 24(3), 362-386.
- Lenney, E. (1977). Women's self-confidence in achievement settings. *Psychological bulletin*, 84(1), 1.
- Lewellen, W. G., Lease, R. C., & Schlarbaum, G. G. (1977). Patterns of investment strategy and behavior among individual investors. *The Journal of Business*, 50(3), 296-333.
- Liu, B., & Tan, M. (2021). Overconfidence and forecast accuracy: An experimental investigation on the hard–easy effect. *Studies in Economics and Finance*, 38(3), 601-618.
- Lo, A. W. (2004). The adaptive markets hypothesis: Market efficiency from an evolutionary perspective. *Journal of Portfolio Management*, *Forthcoming*.
- Loang, O. K. (2025). Why Do Investors Act Irrationally? Behavioral Biases of Herding, Overconfidence, and Overreaction. Vernon Press.
- Locke, P. R., & Mann, S. C. (2015). Learning by aspiring professional traders: Learning to take risk. *Journal of Behavioral and Experimental Finance*, 8, 54-63.
- Lundeberg, M. A., Fox, P. W., & Punčochař, J. (1994). Highly confident but wrong: Gender differences and similarities in confidence judgments. *Journal of educational psychology*, 86(1), 114.
- MacKinnon, J. G. (1996). Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics*, 11(6), 601–618.

- Malikov, G. (2019). Information, participation, and passive investing. *Participation, and Passive Investing (May 1, 2019)*.
- Menkhoff, L., Schmeling, M., & Schmidt, U. (2013). Overconfidence, experience, and professionalism: An experimental study. *Journal of economic behavior & organization*, 86, 92-101.
- Mishra, K. C., & Metilda, M. J. (2015). A study on the impact of investment experience, gender, and level of education on overconfidence and self-attribution bias. *IIMB Management Review*, 27(4), 228-239.
- Mushinada, V. N. C., & Veluri, V. S. S. (2018). Investors overconfidence behaviour at Bombay stock exchange. *International Journal of Managerial Finance*, 14(5), 613-632.
- Nofsinger, J. R. (2001). The impact of public information on investors. *Journal of Banking & Finance*, 25(7), 1339-1366.
- Nair, P. S., & Shiva, A. (2024). Specifying and validating overconfidence bias among retail investors: A formative index. *Managerial Finance*, 50(5), 1017-1036.
- Odean, T. (1998). Volume, volatility, price, and profit when all traders are above average. *The journal of finance*, 53(6), 1887-1934.
- Odean, T. (1999). Do investors trade too much?. *American economic review*, 89(5), 1279-1298.
- Oraon, A. (2025). Assessing the Long-term Return Differences Between Small-cap and Large-cap Stocks in Indian Market. *Available at SSRN 5267498*.
- Oreng, M., Yoshinaga, C. E., & Eid, W. (2021). Disposition effect, demographics and risk taking. *RAUSP Management Journal*, 56(2), 217-233.
- Parhi, S. P., & Pal, M. K. (2022). Impact of overconfidence bias in stock trading approach: a study of high net worth individual (HNI) stock investors in India. *Benchmarking: An International Journal*, 29(3), 817-834.

-
- Park, J., Konana, P., Gu, B., Kumar, A., & Raghunathan, R. (2013). Information valuation and confirmation bias in virtual communities: Evidence from stock message boards. *Information Systems Research*, 24(4), 1050-1067.
- Parkinson, M. (1980). The Extreme Value Method for Estimating the Variance of the Rate of Return. *The Journal of Business*, 53(1), 61-65.
- Pompian, M. M., & Longo, J. M. (2004). A new paradigm for practical application of behavioral finance. *The Journal of Wealth Management*, 7(2), 9-15.
- Prasad, H., & Mohta, B. (2012). Loss Aversion and Overconfidence: Does Gender Matters?. *Annamalai International Journal of Business Studies & Research*, 4(1).
- Prosad, J. M., Kapoor, S., & Sengupta, J. (2013). Impact of overconfidence and the disposition effect on trading volume: An empirical investigation of Indian equity market. *International Journal of Research in Management & Technology*, 3(4), 109–116.
- Prosad, J. M., Kapoor, S., Sengupta, J., & Roychoudhary, S. (2017). Overconfidence and disposition effect in Indian equity market: An empirical evidence. *Global Business Review*, 19(5), 1303-1321.
- Puetz, A., & Ruenzi, S. (2011). Overconfidence among professional investors: Evidence from mutual fund managers. *Journal of Business Finance & Accounting*, 38(5-6), 684-712.
- Qadri, S. U., & Shabbir, M. (2014). An empirical study of overconfidence and illusion of control biases, impact on investor's decision making: An evidence from ISE. *European Journal of Business and Management*, 6(14), 38-44.
- Qasim, M., Hussain, R., Mehboob, I., & Arshad, M. (2019). Impact of herding behavior and overconfidence bias on investors' decision-making in Pakistan. *Accounting*, 5(2), 81-90.

- Quispe-Torreblanca, E., Gathergood, J., Loewenstein, G., & Stewart, N. (2025). Investor logins and the disposition effect. *Management Science*, 71(1), 219-239.
- Rabbani, M. R., Azam, M. Q., Hawaldar, I. T., Aljalahma, R., & Dsouza, S. (2024). Does an overconfidence bias affect stock return, trading volume, and liquidity? Fresh insights from the G7 nations. *Cogent Economics & Finance*, 12(1), 2373266.
- Rahim, A., Bangash, R., & Khan, M. H. (2022). Impact of Availability Bias Effect on Investment Decisions of South Asian Stock Market Individual Investors during Covid-19 Pandemic. *Indian Journal of Economics and Business*, 21(2), 186-99.
- Ranguelova, E. (2001). Disposition effect and firm size: New evidence on individual investor trading activity. *Available at SSRN 293618*.
- Rekik, Y. M., & Boujelbene, Y. (2013). Determinants of individual investors' behaviors: Evidence from Tunisian stock market. *IOSR Journal of Business and Management*, 8(2), 109-119.
- Riyadh, M. R., Wahyudi, S. T., & Fadli, F. (2024). Capital Resilience: Dynamics Movements of Large Cap and Small-Mid Cap Stock in Global Macroeconomic Uncertainty. *Futurity Economics&Law*, 4(4), 107-120.
- Rupande, L., Muguto, H. T., & Muzindutsi, P. F. (2019). Investor sentiment and stock return volatility: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, 7(1), 1600233. <https://doi.org/10.1080/23322039.2019.1600233>
- Safeeda, K. A., & Ganesh, R. (2024). Unmasking the grey swan: Investor biases in times of turbulence. *Indian Journal of Finance*, 18(10), 56-72.
- Safeeda, K. A., & Ganesh, R. (2025). *Grey Swans and Investor Delusions in the Indian Stock Market*. *International Research Journal of Multidisciplinary Scope*, 6(1), 250-262.

-
- Sahi, S. K. (2017). Psychological biases of individual investors and financial satisfaction. *Journal of Consumer Behaviour*, 16(6), 511-535.
- Sahoo, M. (2021). COVID-19 impact on stock market: Evidence from the Indian stock market. *Journal of Public Affairs*, 21(4), e2621.
- Sakaguchi, H., Stewart, N., & Walasek, L. (2019). The disposition effect varies with portfolio composition because people take gain-loss-domain-level sell decisions. *Available at SSRN 3053331*.
- Sapar, N. R. (2017). Empirical Study of Behavioral Biases in the Indian Stock Market.
- Scott, J., Stumpp, M., & Xu, P. (2003). Overconfidence bias in international stock prices. *Journal of Portfolio Management*, 29(2), 80-89.
- Seppälä, A. (2009). Behavioral biases of investment advisors-The effect of overconfidence and hindsight bias. *Master's Thesis*. <https://aaltodoc.aalto.fi/server/api/core/bitstreams/69f5d41b-f63f-4dac-a9e5-bc377e48a02d/content>
- Seru, A., Shumway, T., & Stoffman, N. (2010). Learning by trading. *The Review of Financial Studies*, 23(2), 705-739.
- Shandu, P., & Alagidede, I. P. (2024). The disposition effect and its manifestations in South African investor teams. *Review of Behavioral Finance*, 16(1), 167-185.
- Shapira, Z., & Venezia, I. (2001). Patterns of behavior of professionally managed and independent investors. *Journal of Banking & Finance*, 25(8), 1573-1587.
- Sharma, S., & Negi, V. (2025). Effect of Behavioural Biases on Investors' Decision Making: A Systematic Literature Review. *Metamorphosis*, 24(1), 105-113.
- Shefrin, H., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long: Theory and evidence. *The Journal of finance*, 40(3), 777-790.
- Shiller, R. J. (2020, July). COVID-19 has brought about a second pandemic: financial anxiety. In *World Economic Forum* (Vol. 2). <https://www.weforum.org/stories/>
-

2020/04/pandemics-coronavirus-covid19-economics-finance-stock-market-crisis/

Shrestha, N. R. (2019). Overconfidence and investment decisions in Nepalese stock market. *PYC Nepal Journal of Management*, 12(1), 27-36.

Shrotryia, V. K., & Kalra, H. (2021). *COVID-19 and overconfidence bias: The case of developed, emerging, and frontier markets. International Journal of Emerging Markets*, 16(4), 1019-1045.

Shrotryia, V. K., & Kalra, H. (2023). COVID-19 and overconfidence bias: the case of developed, emerging and frontier markets. *International Journal of Emerging Markets*, 18(3), 633-665.

Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4(6), 592–604.

Sreelakshmi, R., Sinha, A., & Mandal, S. (2022). Covid-19-related uncertainty, investor sentiment, and stock returns in india. *Economic and Political Weekly*, 53-61.

Statman, M., Thorley, S., & Vorkink, K. (2006). *Investor overconfidence and trading volume*. *Review of Financial Studies*, 19(4), 1531–1565.

Subedi, A., & Dangol, J. (2025). Information Framing and Disposition Effect on Nepalese Investors' Decision-making Behavior. *Nepalese Journal of Insurance and Social Security*, 8(2), 10-19.

Syed, A. A., Ullah, A., & Kamal, M. A. (2024). Impact of COVID-19 and lockdown stringency on foreign institutional investment in India: evidence from wavelet coherence and spectral causality approaches. *Quality & Quantity*, 58(3), 2433-2452.

Taleb, N. N. (2007). *The Black Swan: The impact of the highly improbable*. New York: Random House.

-
- Taleb, N. N. (2010). *The Black Swan: Second edition – The impact of the highly improbable: With a new section: “On robustness and fragility”*. New York: Random House.
- Taleb, N. N. (2012). *Antifragile: Things that gain from disorder*. New York: Random House.
- Tekçe, B., & Yılmaz, N. (2015). Are individual stock investors overconfident? Evidence from an emerging market. *Journal of Behavioral and Experimental Finance*, 5, 35-45.
- Times of India. (2022, March 24). Two years on, national Covid-19 plan to end on March 31. The Times of India. <https://timesofindia.indiatimes.com/india/two-years-on-national-covid-19-plan-to-end-on-march-31/articleshow/90405782.cms>
- Torngren, G., & Montgomery, H. (2004). Worse than chance? Performance and confidence among professionals and laypeople in the stock market. *The Journal of Behavioral Finance*, 5(3), 148-153.
- Trejos, C., van Deemen, A., Rodríguez, Y. E., & Gomez, J. M. (2019). Overconfidence and disposition effect in the stock market: A micro world based setting. *Journal of behavioral and experimental finance*, 21, 61-69.
- Vagnani, G., & Mazzurco, F. (2022). Incidental Negative Life Events and the Disposition Effect at the Individual Level. *Journal of Finance and Investment Analysis*, 11(2), 1-21.
- Vega, C. (2006). Stock price reaction to public and private information. *Journal of financial economics*, 82(1), 103-133.
- Verma, M., & Panwar, M. (2025). Overconfidence Bias in Equity Market: a comparative analysis of market uncertainty and tranquil periods in asian economies. *Advances in economics, business and management research*, 324, 357-375.

- Wajid, R. M. (2013). Portfolio Management and Disposition Effect Empirical Evidence From Pakistan. *VFAST Transactions on Education and Social Sciences*, 4(1), 1-9
- Weber, M. and Camerer, C.F. (1998) The Disposition Effect in Securities Trading: An Experimental Analysis. *Journal of Economic Behaviour and Organization*, 33, 167-184.
- Wei, J., & Yang, L. (2012). Short-term momentum and reversals in large stocks. Available at SSRN 2029984. DOI:[10.2139/ssrn.2029984](https://ssrn.com/abstract=2029984)
- Yong, Q. (2015). Relationship between individual investor sentiment with its volatility and returns of small-cap stocks. Available at SSRN 2545814.
- Yuwono, W., & Elmadiani, C. (2021). The effect of emotional contagion, availability bias, overconfidence, loss aversion, and herding on investment decisions in the millennial generation during the beginning of the Covid-19 pandemic. In *Proceedings of the 1st International Conference on Law, Social Science, Economics, and Education, ICLSSEE*, 1(1), 1-8.
- Zahera, S. A., & Bansal, R. (2019). A study of prominence for disposition effect: a systematic review. *Qualitative research in financial markets*, 11(1), 2-21.
- Zainul, Z. R., & Suryani, I. (2021, November). Identification of Herding Behavior, Overconfidence and Risk Tolerance Based on Gender Perspective on Stock Investors in Aceh. In *6th International Conference on Tourism, Economics, Accounting, Management, and Social Science (TEAMS 2021)* (pp. 157-164). Atlantis Press.

Websites

<https://www.nseindia.com/>

<https://shodhganga.inflibnet.ac.in/>

<https://economictimes.indiatimes.com/>

<https://www.thehindu.com/>

<https://economictimes.indiatimes.com/>

<https://www.moneycontrol.com/>

<https://www.dimensions.ai/>

<https://scholar.google.com/>

<https://www.researchgate.net/>

<https://covid19dashboard.mohfw.gov.in/>

APPENDICES

Appendix I

VAR Results of OC Over 2014-22, White Swan, Grey Swan and Black Swan Phases

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
3MINDIA	1	-0.190	-0.208	1.276	1.157	-1.556	-1.061	-0.678	-0.298
	2	-2.436	-2.700	-1.361	-1.239	-2.130	-1.498	-4.285	-1.941
ABB	1	6.690	4.872	1.066	1.031	0.559	0.425	3.524	1.466
	2	3.955	2.878	-1.925	-1.888	-0.190	-0.150	5.514	2.299
ACC	1	-1.132	-1.568	-1.529	-1.644	5.280	3.102	4.750	2.318
	2	-0.292	-0.405	-1.509	-1.631	2.333	1.395	1.459	0.734
ADANIENT	1	0.406	2.083	0.243	1.2	1.243	0.818	-1.381	-0.699
	2	0.183	0.942	0.203	1.005	3.114	2.078	2.205	1.119
ADANIPORTS	1	-1.311	-2.458	0.31	1.534	1.480	1.617	2.140	1.366
	2	-0.760	-1.520	-0.915	-1.455	-1.952	-2.160	-0.508	-0.228
AIAENG	1	0.893	0.915	-0.486	-0.775	0.523	0.217	-0.480	-0.175
	2	-2.634	-2.699	1.05	0.876	2.608	1.094	0.436	0.160
ALSTOM	1	0.676	0.7965	-2.487	-2.077	6.703	3.119	1.617	0.896
	2	-0.822	-0.960	0.669	0.529	9.267	4.350	-0.323	-0.177
ALSTOMTD	1	1.170	1.489	-1.073	-0.851	5.488	1.610	5.488	1.610
	2	-1.160	-1.479	1.058	0.844	2.229	0.644	2.229	0.644
APARIND	1	1.321	1.739	0.383	0.372	6.757	2.922	6.757	2.922
	2	-0.287	-0.379	-2.307	-2.267	0.355	0.144	0.355	0.144
APOLLOHOSP	1	-0.224	-0.391	0.851	0.827	3.781	2.613	3.781	2.613
	2	-1.420	-2.481	-1.181	-1.175	2.948	1.734	2.948	1.734
APOLLOTYRE	1	1.323	3.277	-0.287	-0.358	0.803	0.505	2.961	2.771
	2	0.524	1.361	-2.554	-3.2	-0.378	-0.240	0.859	0.842
AARTIIND	1	1.037	2.138	0.944	1.906	7.354	4.368	2.009	1.650
	2	-1.245	-2.568	-0.056	-0.114	4.425	2.541	-0.423	-0.355
ASHOKA	1	0.006	0.013	1.364	2.009	4.099	3.405	0.634	0.969
	2	0.847	1.634	-1.619	-2.397	2.356	1.637	0.611	1.115
ASIANPAINT	1	0.527	0.933	-1.017	-1.371	0.014	0.259	0.014	0.259
	2	-0.162	-0.287	0.536	0.865	0.096	1.699	0.096	1.699
ASTRAZENCA	1	2.899	2.869	0.433	0.561	1.185	1.078	1.120	0.735
	2	-2.299	-2.357	-1.202	-1.565	-2.750	-2.616	-3.161	-2.151
ASTRAL	1	0.174	0.202	2.899	2.869	-0.295	-0.271	1.814	1.157
	2	1.458	1.689	-2.299	-2.357	-1.948	-1.800	-3.528	-2.295
ATUL	1	4.504	4.260	0.174	0.202	0.475	0.337	-0.100	-0.048
	2	0.407	0.388	1.458	1.689	-1.216	-0.866	0.024	0.011
AUROBINDO	1	-0.280	-0.716	3.736	3.298	0.606	0.889	1.254	1.448
	2	-0.392	-1.005	0.156	0.139	-0.303	-0.449	-0.148	-0.175
AXIS	1	-0.115	-0.473	-0.28	-0.716	0.820	1.121	0.853	0.994
	2	-0.289	-1.192	-0.392	-1.005	0.446	0.607	-0.805	-0.938
BAJAJ-AUTO	1	-0.160	-0.172	-0.115	-0.473	-1.695	-1.446	-2.679	-1.623
	2	0.504	0.545	-0.289	-1.192	-1.497	-1.290	-1.825	-1.117
BAJFINANCE	1	-0.074	-0.314	-0.16	-0.172	0.342	0.475	1.067	0.568
	2	0.007	0.031	0.504	0.545	-0.368	-0.517	1.136	0.608

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
BAJAJFINSV	1	-0.894	-0.890	-0.074	-0.314	1.089	1.420	0.420	0.214
	2	-3.769	-3.798	0.007	0.031	-0.008	-0.010	1.410	0.729
BAJAJHLDNG	1	3.421	2.170	-0.894	-0.89	1.236	0.920	1.605	0.950
	2	-1.244	-0.794	-3.769	-3.798	-1.206	-0.930	-0.308	-0.196
BANKBARODA	1	-0.218	-1.004	3.421	2.17	1.443	2.422	0.773	0.884
	2	0.065	0.300	-1.244	-0.794	0.269	0.456	2.255	2.589
BERGEPAINT	1	0.571	0.895	-0.218	-1.004	3.113	2.522	2.985	2.120
	2	-1.852	-2.929	0.065	0.3	0.133	0.108	0.141	0.099
BEL	1	-0.348	-1.686	0.571	0.895	0.823	0.982	-0.380	1.059
	2	-0.147	-0.712	-1.852	-2.929	-0.713	-0.882	0.912	1.045
BHARATFORG	1	0.141	0.307	-0.348	-1.686	0.187	0.210	0.531	0.459
	2	-0.420	-0.914	-0.147	-0.712	-0.127	-0.144	-0.297	-0.261
BHEL	1	0.139	0.291	0.141	0.307	0.683	1.190	2.112	1.021
	2	-0.178	-0.377	-0.42	-0.914	-1.119	-2.014	0.145	0.072
BPCL	1	-0.379	-0.918	0.139	0.291	0.065	0.076	-0.373	-0.351
	2	-0.371	-0.900	-0.178	-0.377	0.153	0.179	0.302	0.292
AIRTELPP	1	0.661	0.951	-0.379	-0.918	0.370	0.355	0.080	0.061
	2	0.017	0.025	-0.371	-0.9	-2.669	-2.606	-1.740	-1.326
INDUSTOWER	1	-1.746	-2.260	0.661	0.951	0.217	0.339	-0.290	-0.398
	2	-0.452	-0.593	0.017	0.025	0.612	0.965	0.756	1.047
BIOCON	1	0.316	0.967	-1.746	-2.26	1.493	1.775	0.672	0.582
	2	-0.141	-0.436	-0.452	-0.593	0.362	0.430	-0.252	-0.218
BOSCH	1	1.353	1.564	0.316	0.967	0.499	0.457	-1.057	-0.761
	2	-0.112	-0.131	-0.141	-0.436	-1.558	-1.465	-2.313	-1.708
BRITANNIA	1	-1.795	-3.120	1.353	1.564	-0.984	-0.781	-0.974	-0.600
	2	-0.826	-1.431	-0.112	-0.131	-1.651	-1.316	-1.005	-0.628
CANARA	1	-0.401	-0.920	-1.795	-3.12	1.257	1.745	0.050	1.070
	2	-1.221	-2.861	-0.826	-1.431	0.370	0.522	-0.047	-1.014
CHOLAFIN	1	-0.182	-0.377	-0.401	-0.92	0.705	0.970	0.609	0.689
	2	-0.601	-1.244	-1.221	-2.861	-1.639	-2.277	-1.112	-1.263
CIPLA	1	-1.786	-2.324	-0.182	-0.377	-0.399	-0.402	-1.103	-0.838
	2	-2.093	-2.716	-0.601	-1.244	-2.342	-2.442	-2.782	-2.204
COALINDIA	1	-2.127	-2.619	-1.786	-2.324	-0.011	-0.008	-0.120	-0.112
	2	-2.886	-3.560	-2.093	-2.716	-3.926	-2.956	0.393	0.364
COLGATE	1	-0.184	-0.282	-2.127	-2.619	-0.011	-0.008	0.003	0.002
	2	-1.225	-1.896	-2.886	-3.56	-3.926	-2.956	-4.235	-2.491
CONCOR	1	-1.411	-2.040	-0.184	-0.282	-2.305	-2.443	-2.055	-1.699
	2	-2.555	-3.698	-1.225	-1.896	-0.934	-0.996	-0.682	-0.567
COROMANDEL	1	-0.586	-0.534	-1.411	-2.04	0.549	0.413	0.395	0.203
	2	-2.456	-2.243	-2.555	-3.698	-3.239	-2.459	-4.070	-2.119
CRISIL	1	-0.602	-0.444	-0.586	-0.534	0.049	0.037	-0.319	-0.165
	2	0.270	0.200	-2.456	-2.243	-1.601	-1.211	-3.128	-1.621
CUMMINS	1	-0.682	-0.663	-0.602	-0.444	1.137	1.087	0.791	0.553
	2	-2.882	-2.804	0.27	0.201	-0.637	-0.615	0.340	0.239
DABURE	1	1.206	1.179	-0.682	-0.663	-1.197	-0.892	-2.250	-1.347
	2	-2.017	-1.979	-2.882	-2.804	-3.192	-2.374	-5.069	-3.037

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
DIVIS	1	-0.227	0.511	1.206	1.179	1.316	1.235	3.042	1.979
	2	-0.302	0.509	-2.017	-1.979	-0.631	-0.598	-0.640	-0.431
DLF	1	-0.158	-0.434	-0.227	0.511	0.164	0.228	-0.291	-0.294
	2	-0.392	-1.084	-0.302	0.509	-0.137	-0.192	0.476	0.488
DRREDDY	1	-1.232	-1.820	-0.158	-0.434	-1.002	-0.996	-0.742	-0.478
	2	-0.572	-0.846	-0.392	-1.084	-0.119	-0.119	-1.228	-0.835
EICHERMOT	1	-0.985	-1.386	-1.232	-1.82	-0.331	-1.688	-0.401	-1.925
	2	-2.604	-3.673	-0.572	-0.846	0.251	1.323	0.340	1.809
ESCORTS	1	-0.169	-0.273	-0.985	-1.386	0.238	0.275	0.920	0.770
	2	-2.060	-3.550	-2.604	-3.673	-1.838	-2.190	-1.270	-1.146
EXIDE	1	-1.919	-0.906	-0.169	-0.273	-0.664	-0.553	-1.677	-0.982
	2	-3.032	-1.438	-2.06	-3.55	-2.591	-2.181	-2.960	-1.774
SCHAEFFLER	1	-1.919	-0.906	-0.155	-0.195	-0.464	-0.894	4.253	1.144
	2	-3.032	-1.438	-0.175	-0.22	-0.510	-0.984	1.828	0.485
FEDERALBNK	1	0.530	1.081	-1.919	-0.906	1.007	1.206	-0.725	-0.615
	2	-0.970	-1.983	-3.032	-1.438	-0.731	-0.911	-0.103	-0.093
FSL	1	1.285	2.498	0.563	1.182	0.271	0.351	1.063	0.760
	2	-1.874	-3.785	-0.721	-1.515	-2.152	-2.928	-2.057	-1.573
FORTIS	1	-0.731	-1.004	-1.113	-2.347	0.649	0.547	1.485	0.674
	2	-3.191	-4.523	1.285	2.498	-1.463	-1.288	-0.454	-0.210
GAIL	1	-0.150	-0.312	-1.874	-3.785	0.104	0.128	-0.547	-0.536
	2	-1.054	-2.196	-0.731	-1.004	-0.253	-0.308	0.763	0.742
GILLETTE	1	5.423	3.804	-3.191	-4.523	3.539	1.415	4.807	1.261
	2	1.106	0.776	-0.15	-0.312	0.604	0.241	-0.885	-0.230
GSKCONS	1	0.803	1.304	-1.054	-2.196	1.572	1.064	-0.504	-0.235
	2	-0.601	-0.978	5.423	3.804	-1.624	-1.100	-1.344	-0.630
GLENMARK	1	-0.175	-0.263	1.106	0.776	1.095	1.485	1.594	1.650
	2	-0.516	-0.771	0.803	1.304	-1.613	-2.247	-1.102	-1.179
GMRINFRA	1	-0.204	-0.421	-0.601	-0.978	2.586	3.174	3.945	3.165
	2	-0.749	-1.574	-0.175	-0.263	-0.836	-1.086	-1.420	-1.181
GODFRYPHLP	1	0.313	0.869	-0.516	-0.771	0.955	0.718	0.673	0.386
	2	-0.747	-2.078	-0.204	-0.421	-1.899	-1.504	-2.537	-1.579
GODREJCON	1	-0.290	-0.474	-0.749	-1.574	1.151	1.169	1.176	0.903
	2	-1.465	-2.398	0.313	0.869	-1.070	-1.090	-3.306	-2.561
GODREJPROP	1	0.408	0.465	-0.747	-2.078	-2.016	-2.075	-0.590	-0.385
	2	-2.233	-2.590	-0.29	-0.474	-0.469	-0.490	-1.244	-0.840
GRASSIM	1	-0.253	-0.789	-1.465	-2.398	0.335	0.296	-0.535	-0.401
	2	0.219	0.685	0.408	0.465	-2.111	-1.899	-1.110	-0.847
HDFCBANK	1	-1.047	-1.731	-2.233	-2.59	1.282	1.193	2.142	1.612
	2	-1.293	-2.129	-0.253	-0.789	-0.861	-0.798	-1.222	-0.910
HAVELLS	1	-0.211	-0.648	0.219	0.685	6.001	5.210	6.771	3.817
	2	-0.793	-2.442	-1.047	-1.731	1.989	1.695	-0.561	-0.308
HCLTECH	1	0.240	0.582	-1.293	-2.129	2.949	2.636	4.384	2.822
	2	0.235	0.571	-0.691	-2.007	0.213	0.189	1.308	0.833
HEROMOTO	1	2.244	3.055	-0.942	-2.74	5.062	4.790	5.076	4.136
	2	-2.960	-4.018	-0.466	-1.085	-2.041	-1.891	-1.627	-1.283

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
HINDALCO	1	4.912	10.50	-0.119	-0.278	-11.13	-6.800	6.798	5.930
	2	-0.676	-1.405	0.727	0.767	2.971	1.734	0.617	0.502
HINDPETRO	1	1.076	3.347	-3.194	-3.37	5.233	6.250	5.063	4.628
	2	-0.667	-2.070	3.546	6.2	-0.679	-0.778	-0.823	-0.707
HUL	1	3.328	4.231	-0.548	-0.946	2.425	1.981	3.922	2.109
	2	-0.805	-1.020	0.55	1.579	-1.170	-0.956	-1.638	-0.905
HINDZINC	1	4.641	5.483	-0.596	-1.709	8.024	7.930	7.357	5.068
	2	3.243	3.800	4.404	4.441	2.280	2.152	0.666	0.440
HONAUT	1	6.707	4.604	0.291	0.292	5.818	4.247	4.244	2.274
	2	3.027	2.096	4.641	5.483	2.386	1.718	2.746	1.457
ICICI	1	-0.058	-0.218	3.243	3.8	5.818	4.247	2.503	1.992
	2	-0.120	-0.452	6.707	4.604	2.386	1.718	-0.817	-0.649
IDBI	1	7.274	14.13	3.027	2.096	5.293	5.807	8.553	6.819
	2	-0.171	-0.311	-0.058	-0.218	0.088	0.094	3.104	2.252
IDFC	1	2.092	4.039	-0.12	-0.452	8.881	11.009	5.689	5.449
	2	-0.129	-0.248	7.274	14.13	0.582	0.659	1.419	1.300
INDIANB	1	6.338	9.768	-0.171	-0.311	8.263	10.839	11.528	9.650
	2	-0.905	-1.355	2.092	0.518	0.884	1.061	2.162	1.550
IHCL	1	8.338	8.189	-0.129	0.521	9.506	9.035	10.14	6.273
	2	1.216	1.172	6.338	9.768	0.501	0.446	1.826	1.049
IOC	1	1.382	3.032	-0.905	-1.355	6.342	5.748	5.232	3.235
	2	-0.386	-0.845	8.338	8.189	-2.314	-2.030	-3.387	-2.047
INDUSINDBK	1	3.874	4.089	1.216	1.172	1.728	2.762	1.669	2.597
	2	-2.804	-2.959	1.382	3.032	0.642	1.021	1.005	1.572
NAUKRI	1	8.682	7.327	-0.386	-0.845	4.236	4.680	4.845	3.719
	2	1.625	1.355	3.874	4.089	-0.415	-0.446	0.666	0.493
INFY	1	-0.713	-1.905	-2.804	-2.959	5.051	4.598	5.402	3.771
	2	-0.049	-0.131	8.682	7.327	0.423	0.379	0.601	0.412
IRB	1	5.388	8.590	1.625	1.355	9.005	12.15	9.002	8.777
	2	0.091	0.142	-0.713	-1.905	1.517	1.875	2.116	1.856
ITC	1	0.110	0.148	-0.049	-0.131	5.515	5.480	2.835	2.228
	2	-0.658	-0.884	5.388	8.59	0.008	0.008	-1.382	-1.084
JINDALSTEL	1	3.799	8.577	0.091	0.142	3.367	5.090	3.712	4.139
	2	-0.158	-0.348	0.11	0.148	-0.800	-1.169	0.194	0.203
JSWENERGY	1	7.307	10.35	-0.658	-0.884	8.927	9.329	10.10	6.234
	2	0.502	0.687	3.799	8.577	0.619	0.604	1.981	1.147
JSWSTEEL	1	-0.221	-1.175	-0.158	-0.348	3.614	4.392	4.890	4.072
	2	-0.649	-3.454	7.307	10.359	0.817	0.974	1.026	0.828
JUBLFOOD	1	2.136	3.814	0.502	0.687	4.474	4.833	5.087	3.693
	2	-1.332	-2.369	-0.221	-1.175	-2.000	-2.108	-2.989	-2.060
KOTAKBANK	1	1.613	2.404	-0.649	-3.454	4.946	4.343	4.538	3.124
	2	0.643	0.957	2.136	3.814	-0.694	-0.604	-1.507	-1.033
KPITTECH	1	2.693	4.421	-1.332	-2.369	8.357	11.43	12.184	10.26
	2	-1.277	-2.099	1.613	2.404	0.850	1.056	2.766	1.982
LTF	1	7.288	9.222	0.643	0.957	5.333	6.826	5.199	5.099
	2	0.343	0.423	2.693	4.421	2.165	2.674	2.070	1.928

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
L&T	1	3.583	5.181	-1.277	-2.099	8.759	7.054	5.859	3.921
	2	-0.550	-0.788	7.288	9.222	0.274	0.217	1.489	1.002
LICHSGFIN	1	1.937	2.459	0.343	0.423	4.932	5.421	3.681	3.112
	2	-0.186	-0.237	3.583	5.181	-0.954	-1.025	-1.250	-1.037
LINDEINDIA	1	13.879	12.242	-0.55	-0.788	15.52	13.51	18.07	9.212
	2	1.902	1.606	1.937	2.459	5.530	4.259	3.254	1.440
LTIM	1	0.473	0.981	-0.186	-0.237	8.070	8.123	6.169	4.206
	2	-0.076	-0.159	13.87	12.24	0.613	0.580	-0.267	-0.173
LUPIN	1	-0.994	-1.173	1.902	1.606	5.270	5.257	6.609	5.209
	2	-1.465	-1.733	0.473	0.981	-1.780	-1.736	-0.275	-0.209
M&MFIN	1	5.144	7.079	-0.076	-0.159	1.713	2.400	1.706	2.068
	2	-1.290	-1.744	-0.994	-1.173	-0.237	-0.335	0.228	0.281
M&M	1	0.227	0.401	-1.465	-1.733	6.603	7.083	5.198	4.312
	2	-0.377	-0.669	5.144	7.079	-1.119	-1.167	-0.949	-0.784
MARICO	1	2.048	2.843	-1.29	-1.744	7.304	5.343	2.489	1.559
	2	0.810	1.125	0.227	0.401	2.722	1.933	2.628	1.636
MARUTI	1	4.013	4.304	-0.377	-0.669	5.848	6.152	4.418	3.963
	2	-2.443	-2.606	2.048	2.843	-1.303	-1.331	0.092	0.080
MOTHERSON	1	1.286	2.318	0.81	1.125	-2.992	-1.583	2.866	2.850
	2	-0.355	-0.641	4.013	4.304	0.148	3.678	0.159	0.155
MOTILALOFS	1	10.323	10.74	-2.443	-2.606	8.290	8.112	5.653	4.155
	2	-1.449	-1.465	1.286	2.318	2.503	2.337	3.376	2.438
MPHASIS	1	8.021	7.490	-0.355	-0.641	6.363	5.048	5.277	2.642
	2	1.731	1.598	10.323	10.742	2.301	1.7891	3.503	1.750
MRF	1	9.102	9.778	-1.449	-1.465	7.959	6.097	9.397	5.237
	2	0.548	0.570	8.021	7.49	-0.523	-0.393	-1.882	-1.014
MUTHOOTFIN	1	9.585	9.822	1.731	1.598	8.050	7.972	5.491	4.385
	2	0.407	0.405	9.102	9.778	1.633	1.535	1.011	0.778
NATIONALUM	1	6.387	9.504	0.548	0.57	6.392	9.018	5.338	4.096
	2	0.781	1.136	9.585	9.822	-0.107	-0.143	-1.706	-1.273
NHPC	1	8.015	7.980	0.407	0.405	10.38	7.695	8.561	4.161
	2	1.067	1.047	6.387	9.504	1.174	0.831	-2.140	-1.003
NMDC	1	3.850	5.167	0.781	1.136	4.935	5.920	5.244	4.328
	2	0.954	1.269	8.015	7.98	0.147	0.171	-0.486	-0.387
NTPC	1	1.454	1.364	1.067	1.047	6.950	5.989	2.117	1.282
	2	-1.050	-0.985	3.85	5.167	-1.022	-0.856	-1.640	-0.990
OBEROIRLTY	1	8.412	8.651	0.954	1.269	8.997	8.874	8.126	5.614
	2	2.132	2.142	1.454	1.364	-0.269	-0.252	-0.276	-0.181
ONGC	1	2.048	2.999	-1.05	-0.985	5.979	7.217	4.795	4.247
	2	-0.326	-0.476	8.412	8.651	-1.223	-1.386	-2.037	-1.735
OILINDIA	1	2.168	3.496	2.132	2.142	5.481	5.358	2.780	1.946
	2	0.329	0.529	2.048	2.999	1.361	1.287	-0.066	-0.046
ORACLE	1	7.230	7.122	-0.326	-0.476	5.990	4.036	4.817	2.310
	2	1.496	1.457	0.101	0.132	2.342	1.554	1.299	0.612
PAGEIND	1	3.520	5.379	-0.055	-0.073	5.948	5.624	4.941	2.944
	2	0.189	0.287	7.97	5.998	-0.251	-0.231	0.884	0.516

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
PERSISTENT	1	2.820	4.789	1.691	1.255	9.730	8.592	9.343	1.806
	2	0.628	1.062	2.572	3.228	1.286	1.071	3.341	1.916
PETRONET	1	2.919	5.275	0.562	0.706	3.001	2.357	4.193	2.756
	2	-0.728	-1.313	0.961	1.406	-3.850	-3.029	-4.131	-2.726
PFIZER	1	10.12	10.555	0.208	0.304	-6.106	-3.098	13.858	5.845
	2	1.155	1.177	2.975	4.833	0.710	0.363	0.391	0.155
PHOENIX	1	6.666	5.553	-0.015	-0.025	4.904	3.812	1.708	0.888
	2	-0.818	-0.678	9.023	8.084	1.273	0.979	0.213	0.110
PIIND	1	5.672	6.777	2.751	2.418	6.022	4.900	3.144	1.610
	2	-0.352	-0.417	8.498	5.142	-1.440	-1.161	1.175	0.605
PIDILITE	1	9.777	11.217	-0.891	-0.535	9.666	6.848	6.931	3.815
	2	1.405	1.569	6	5.896	0.547	0.368	-0.812	-0.428
PEL	1	4.225	6.884	1.303	1.27	5.139	6.980	3.410	4.141
	2	-0.704	-1.139	9.7	8.952	0.115	0.150	-0.256	-0.300
PFC	1	2.456	5.633	2.008	1.812	6.373	5.997	5.585	4.046
	2	-0.466	-1.061	3.759	4.488	-0.073	-0.067	-1.571	-1.103
POWERGRID	1	4.158	5.148	-0.702	-0.833	3.795	3.672	2.658	1.409
	2	-0.064	-0.079	1.802	3.793	0.121	0.116	1.891	1.003
PRESTIGE	1	8.350	11.955	-0.478	-1	7.117	8.764	4.596	4.579
	2	0.547	0.7604	4.495	3.792	0.881	1.020	-0.423	-0.404
PGHH	1	6.053	3.945	0.594	0.499	7.934	3.724	9.397	3.074
	2	2.244	1.458	9.356	10.04	0.432	0.198	3.726	1.195
PNB	1	0.243	1.007	1.301	1.352	3.708	4.172	4.374	4.590
	2	-0.063	-0.263	5.293	2.657	0.353	0.387	1.494	1.501
PVR	1	6.994	9.477	4.014	2.023	5.08	6.318	4.833	4.958
	2	-0.126	-0.167	0.065	0.26	-1.358	-1.628	-1.449	-1.417
RADICO	1	11.188	20.901	-0.101	-0.4	12.64	13.45	12.364	9.181
	2	1.517	2.582	8.785	8.301	2.567	2.413	2.385	1.562
REC	1	2.531	5.905	1.838	1.702	7.296	7.298	5.622	4.508
	2	-0.256	-0.594	10.57	16.286	0.952	0.912	2.212	1.699
RELIANCE	1	3.165	6.807	1.313	1.865	6.167	5.736	3.360	2.781
	2	0.235	0.499	1.696	3.569	0.867	0.779	0.701	0.568
SHREECEM	1	4.590	4.716	-0.355	-0.744	6.382	5.012	6.371	3.417
	2	-2.313	-2.362	2.26	0.497	-0.371	-0.285	1.455	0.758
SRIRAMFIN	1	5.974	4.694	0.179	0.5	8.088	6.071	6.059	2.538
	2	-0.104	-0.082	4.483	3.735	-0.528	-0.386	-2.239	-0.929
SEIMENS	1	7.404	9.464	-2.311	-1.927	11.95	8.206	9.947	5.415
	2	1.340	1.677	3.48	1.84	5.139	3.353	5.073	2.630
SRF	1	1.636	5.027	-0.673	-0.357	-0.189	-0.581	9.971	6.098
	2	0.185	0.564	5.805	6.249	0.215	0.661	4.227	2.425
SUNDARAMFIN	1	12.731	11.442	0.309	0.328	10.404	6.232	8.485	3.842
	2	3.347	2.9202	11.152	14.332	0.798	0.462	-1.042	-0.459
SBI	1	-0.092	-0.550	0.248	0.298	7.092	8.255	5.912	5.336
	2	-0.391	-2.334	14.82	10.035	-0.769	-0.854	-0.381	-0.326
SAI	1	5.232	11.449	6.518	4.278	5.074	7.273	6.204	6.030
	2	-0.327	-0.697	-0.303	-1.734	0.369	0.507	0.864	0.777
SUNPHARMA	1	2.319	3.702	-0.383	-2.19	9.655	8.985	7.512	5.875

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
SUPREMEIND	2	-0.691	-1.101	5.311	9.074	3.118	2.743	2.950	2.204
	1	7.043	6.486	-0.397	-0.661	3.03	3.687	7.182	3.444
	2	-0.668	-0.610	-0.038	-0.051	-8.75	-1.066	0.648	0.300
SUZLON	1	2.015	6.086	-1.853	-2.486	1.005	1.402	0.579	0.716
	2	0.672	2.016	7.769	5.515	0.881	1.232	0.443	0.550
TATACOM	1	5.982	9.180	-0.646	-0.455	5.425	5.286	5.004	3.878
	2	1.244	1.869	2.617	7.211	0.309	0.292	2.877	2.085
TCS	1	-0.514	-1.019	0.445	1.21	2.703	2.420	5.012	3.525
	2	0.440	0.872	7.737	8.484	0.435	0.385	1.174	0.795
TATACONSUM	1	8.524	12.500	2.759	2.952	7.996	6.486	7.633	4.973
	2	1.184	1.675	-1.122	-1.97	0.867	0.680	1.522	0.941
TATAELXSI	1	7.045	16.13	0.403	0.7081	10.290	12.40	8.660	6.585
	2	0.092	0.199	8.951	10.99	0.322	0.349	0.877	0.619
TATAINVEST	1	21.77	23.61	1.584	1.866	18.103	12.507	18.40	8.656
	2	5.117	4.949	6.185	12.182	4.210	2.608	4.150	1.749
TATAMOTORS	1	3.626	8.073	0.271	0.509	6.389	9.845	7.311	8.374
	2	-0.145	-0.319	23.748	20.214	0.007	0.010	-0.378	-0.390
TATAPOWER	1	6.042	9.867	5.962	4.503	6.186	8.085	5.356	4.388
	2	0.822	1.313	1.869	3.261	1.040	1.286	0.783	0.609
TATASTEEL	1	4.960	10.29	-0.179	-0.311	5.377	7.270	5.641	5.736
	2	-1.47	-2.981	5.781	6.865	-1.221	-1.579	0.106	0.101
TECHM	1	0.243	0.733	1.051	1.227	4.600	4.213	2.819	1.898
	2	-0.039	-0.117	4.657	7.583	-0.198	-0.179	-0.449	-0.301
TITAN	1	6.348	9.276	-1.334	-2.135	7.253	6.217	5.547	3.779
	2	0.208	0.298	-0.151	-0.425	0.618	0.511	0.306	0.203
TORNTPHARM	1	4.877	6.010	-0.016	-0.047	3.242	2.438	5.636	3.495
	2	-1.081	-1.322	5.909	7.124	-1.867	-1.394	-0.711	-0.434
TORNTPOWER	1	12.127	19.98	0.14	0.166	12.63	8.876	11.906	5.315
	2	2.478	3.741	5.693	5.689	5.397	3.600	4.344	1.887
TRENT	1	0.819	2.073	-0.277	-0.275	10.58	8.910	8.624	4.913
	2	0.164	0.415	12.174	18.362	-0.493	-0.397	0.421	0.237
TVSMOTOR	1	7.947	12.63	1.662	2.264	9.932	8.892	5.314	3.668
	2	-0.620	-0.948	0.237	0.546	-0.829	-0.697	-1.298	-0.875
ULTRACEMCO	1	6.129	7.537	0.199	0.459	9.114	6.912	9.063	5.166
	2	0.394	0.479	7.456	9.875	0.620	0.451	3.104	1.652
UNIONBANK	1	4.276	10.64	-0.129	-0.166	6.955	8.770	6.430	5.156
	2	0.466	1.137	4.576	4.588	2.126	2.529	2.287	1.742
UBL	1	9.048	11.36	0.385	0.383	8.851	6.042	10.848	5.789
	2	0.647	0.788	3.743	7.97	2.445	1.605	2.231	1.117
MCDHOLDING	1	4.014	7.438	-0.176	-0.369	9.256	8.218	8.93	5.694
	2	-0.183	-0.335	9.112	9.748	2.021	1.703	2.141	1.287
UPL	1	-4.420	-3.502	0.191	0.198	5.051	5.319	1.186	0.910
	2	-0.651	-0.516	0.276	0.875	0.475	0.491	0.146	0.114
VEDL	1	3.229	7.506	-0.29	-0.918	3.335	4.561	1.885	1.846
	2	-0.012	-0.028	3.775	5.986	0.434	0.583	-0.068	-0.066
VOLTAS	1	7.250	11.993	0.066	0.104	10.67	8.439	9.878	5.849
	2	0.674	1.076	3.306	6.208	0.710	0.528	1.535	0.847

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
WIPRO	1	2.088	4.115	-0.163	-0.303	10.975	10.127	9.738	6.820
	2	-0.330	-0.648	6.421	9.22	0.208	0.176	-0.149	-0.095
YESBANK	1	-0.376	-1.839	0.743	1.039	0.399	1.033	-0.102	-0.229
	2	-0.588	-2.873	-0.102	-0.182	0.044	0.116	0.051	0.116
ZYDUSLIFE	1	0.653	1.885	-0.576	-1.033	9.131	9.051	9.702	7.323
	2	-0.107	-0.309	-0.582	-2.421	1.586	1.461	3.263	2.220
AJANTAPHARM	1	0.423	0.998	-0.761	-3.178	3.897	3.138	5.170	3.118
	2	-0.995	-2.360	-0.062	-0.164	-0.503	-0.406	0.346	0.206
AKZOINDIA	1	1.687	1.418	-0.253	-0.67	3.677	2.193	1.418	0.687
	2	-1.967	-1.658	0.268	0.616	-0.280	-0.168	1.865	0.920
APLLTD	1	-0.703	-0.848	-0.67	-1.546	1.300	1.256	2.028	1.607
	2	-2.936	-3.586	0.969	0.663	-0.404	-0.398	0.204	0.165
ARE&M	1	-1.878	-2.515	-1.665	-1.141	1.393	1.521	1.565	1.361
	2	-3.967	-5.346	0.324	0.311	0.005	0.005	1.368	1.201
AMBUJACEM	1	0.311	0.470	-1.772	-1.728	2.560	2.891	1.128	0.859
	2	-0.842	-1.366	-1.697	-1.911	0.137	0.155	-1.361	-1.044
ANANTRAJ	1	1.255	3.169	-3.239	-3.674	2.266	3.628	2.115	3.000
	2	-1.196	-3.175	-0.2	-0.225	0.519	0.852	0.999	1.474
ASAHIINDIA	1	0.115	0.142	-0.851	-0.963	0.916	0.743	0.701	0.395
	2	-1.810	-2.418	1.092	1.968	-3.205	-2.704	-1.907	-1.113
ASHOK	1	-1.140	-1.648	-2.562	-4.955	1.345	1.856	2.003	1.935
	2	-2.296	-3.358	1.665	1.612	-0.104	-0.146	-0.687	-0.679
BANKINDIA	1	-0.199	-0.533	0.002	0.002	1.669	2.383	3.489	3.106
	2	-1.221	-3.342	-0.247	-0.285	-0.491	-0.735	1.118	1.050
BASF	1	0.989	1.375	-1.65	-1.917	2.871	2.872	4.427	2.911
	2	-2.667	-3.809	-0.258	-0.59	-0.103	-0.108	-1.213	-0.869
BEML	1	-0.587	-1.113	-0.624	-1.446	3.043	3.317	3.483	2.599
	2	-3.927	-7.888	1.384	1.569	0.171	0.192	2.215	1.732
BFUTILITIE	1	1.514	3.124	-0.727	-0.832	2.541	3.450	2.078	1.771
	2	-2.428	-5.442	-0.577	-0.948	-0.675	-0.954	-2.193	-1.966
BIRLACORPN	1	-0.286	-0.352	-3.588	-6.257	4.011	4.641	4.801	3.931
	2	-4.112	-5.152	2.239	3.719	0.485	0.562	0.790	0.655
BLUEDART	1	-0.203	-0.195	-2.691	-4.959	2.170	1.729	2.381	1.372
	2	-1.892	-1.837	-1.274	-1.153	-1.923	-1.554	-0.404	-0.237
BPTC	1	1.574	2.653	-4.355	-3.989	3.196	3.288	3.362	2.587
	2	-3.939	-7.250	-0.888	-0.646	-0.271	-0.294	-0.677	-0.554
BRIGADE	1	-0.315	-2.417	-1.34	-0.983	-0.297	-2.115	1.698	1.642
	2	0.151	1.164	1.826	2.673	0.246	1.783	0.053	0.051
CANFINHOME	1	-0.885	-2.834	-4.038	-6.456	3.555	3.620	6.398	4.670
	2	-1.262	-4.064	1.353	1.564	0.411	0.426	3.446	2.499
CARBORUNIV	1	-0.055	-1.479	-0.112	-0.131	3.511	2.781	3.699	1.709
	2	-0.085	-2.299	-0.893	-2.879	2.694	2.134	5.872	2.682
CASTROL	1	-0.012	-0.022	-0.94	-3.036	2.289	2.334	1.959	1.600
	2	-2.071	-3.876	1.755	1.318	0.346	0.353	0.442	0.362
CENTRALBK	1	0.667	1.180	-3.287	-2.498	1.762	2.345	2.715	2.360
	2	-2.851	-5.219	-0.059	-0.097	-2.916	-4.153	-2.236	-2.019

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
CENTURYPLY	1	1.153	1.930	-1.973	-3.263	5.464	5.389	6.029	3.641
	2	-1.183	-2.031	0.971	1.325	0.665	0.659	0.030	0.018
ABREL	1	-0.034	-1.559	-1.605	-2.227	0.291	2.266	1.834	2.042
	2	-0.055	-2.578	-0.295	-0.407	0.177	1.396	0.363	0.425
CESC	1	-0.196	-0.921	-1.679	-2.367	0.051	0.208	1.733	1.318
	2	-0.207	-0.973	1.211	3.4	0.051	0.206	1.579	1.202
CHAMBLFERT	1	0.832	1.283	-0.553	-1.57	1.585	1.646	2.058	1.326
	2	-2.873	-4.676	0.503	0.738	-0.818	-0.887	1.449	0.957
CUB	1	-0.675	-0.785	-0.897	-1.324	1.616	1.713	0.863	0.717
	2	-1.814	-2.116	1.962	2.441	1.850	1.976	2.504	2.096
CROMPTON	1	0.536	2.367	-1.714	-2.238	0.730	1.926	5.820	3.452
	2	0.372	1.647	1.564	1.433	0.779	2.050	3.932	2.331
CYIENT	1	0.287	0.314	-0.73	-0.669	2.486	2.620	2.682	1.751
	2	-1.076	-1.183	0.414	1.345	0.076	0.082	0.868	0.576
DBREALTY	1	3.255	8.167	-0.041	-0.134	4.987	5.381	5.016	5.353
	2	-0.001	-0.004	0.422	0.326	-0.338	-0.365	-0.351	-0.375
DCMSHRIRAM	1	0.480	0.918	-0.176	-0.136	1.044	1.260	2.571	2.013
	2	-1.313	-2.605	2.868	6.513	0.175	0.224	3.361	2.737
DEEPAKFERT	1	0.960	1.628	-0.023	-0.054	2.354	2.851	1.736	1.333
	2	-3.015	-5.347	0.92	1.438	-0.786	-1.011	-1.197	-1.026
ECLERX	1	0.826	1.058	-1.101	-1.775	2.820	3.076	4.423	2.880
	2	-1.315	-1.697	0.6	0.798	0.614	0.674	-0.501	-0.328
EDELWEISS	1	1.660	4.009	-1.838	-2.54	2.797	3.829	4.342	4.216
	2	-0.537	-1.327	0.04	0.036	0.645	0.914	0.609	0.629
EIDPARRY	1	0.638	0.943	-2.51	-2.272	3.563	3.568	3.869	2.756
	2	-3.138	-4.785	1.252	2.501	-0.920	-0.968	-0.954	-0.713
EIHLTD	1	1.184	1.460	-0.872	-1.775	1.823	1.698	0.567	0.345
	2	-2.748	-3.508	0.861	1.028	0.236	0.225	-0.694	-0.437
ELECTROSL	1	0.824	1.833	-2.267	-2.752	1.966	2.506	1.888	1.559
	2	-1.499	-3.440	2.035	1.991	-1.156	-1.571	-1.529	-1.388
ELGIEQUIP	1	0.857	1.033	-2.079	-2.113	0.979	1.031	0.009	0.008
	2	-1.387	-1.709	0.88	1.634	0.445	0.481	1.734	1.434
EMAMILTD	1	-0.185	-0.276	-0.963	-1.827	3.948	3.333	3.945	2.692
	2	-2.435	-3.636	3.631	2.737	0.174	0.145	0.740	0.499
ENGINEERSIN	1	-0.173	-0.388	-1.768	-1.344	2.486	2.500	2.765	1.959
	2	-1.220	-2.746	-0.451	-0.599	1.021	1.035	1.570	1.119
ESABINDIA	1	3.298	4.165	-2.344	-3.111	3.390	2.860	5.027	3.713
	2	-1.715	-2.217	-0.003	-0.006	0.475	0.416	0.185	0.141
EPL	1	0.889	1.382	-0.972	-1.992	2.509	1.997	3.499	2.243
	2	-1.022	-1.595	3.44	3.442	-1.469	-1.185	-0.994	-0.648
FDCLTD	1	0.602	0.715	-1.89	-1.928	2.410	2.033	2.651	1.491
	2	-3.959	-4.881	1.149	1.599	-2.044	-1.827	-3.852	-2.363
FINCABLES	1	0.716	0.843	-0.004	-0.005	1.730	1.574	0.479	0.286
	2	-2.674	-3.237	2.499	2.4	0.146	0.134	3.381	2.024
FINPIPE	1	-0.582	-1.335	-1.19	-1.17	-0.211	-0.518	3.678	2.418
	2	-0.955	-2.191	0.928	0.839	-0.194	-0.474	1.747	1.183

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
GABRIEL	1	0.470	0.771	-3.156	-2.907	0.306	0.309	0.760	0.637
	2	-4.046	-7.046	1.682	1.466	-2.401	-2.537	0.406	0.345
GHCLLTD	1	1.822	3.396	-1.375	-1.205	3.190	3.971	3.056	2.512
	2	-1.944	-3.800	1.31	1.809	-0.350	-0.456	-0.116	-0.100
GODREJIND	1	0.965	1.208	-4.448	-6.443	2.739	2.145	1.588	0.976
	2	-2.964	-3.738	2.142	3.202	-0.098	-0.078	0.312	0.191
GRAPHITE	1	0.185	0.329	-2.262	-3.534	2.195	3.228	2.596	2.366
	2	-3.273	-6.120	1.836	1.863	-0.388	-0.594	0.496	0.466
GESHIPPING	1	-0.500	-0.566	-1.977	-2.019	-0.328	-0.070	-0.328	-0.070
	2	1.116	1.265	0.477	0.656	6.800	1.468	6.800	1.468
GUJALKALI	1	0.522	0.791	-3.16	-4.55	1.956	1.977	2.815	2.004
	2	-4.163	-6.742	-0.535	-0.596	-1.675	-1.866	-0.330	-0.245
FLUOROCHEM	1	-0.231	-0.890	0.848	0.944	2.263	2.686	3.696	2.657
	2	-0.094	-0.364	1.334	1.636	-1.524	-1.826	-1.374	-0.974
GIPCL	1	-0.312	-0.349	-2.911	-3.731	0.593	0.412	5.502	3.062
	2	-4.382	-5.066	-0.467	-1.658	-4.285	-3.236	-0.848	-0.502
GMDCLTD	1	0.314	0.503	0.006	0.024	1.423	1.552	2.877	2.021
	2	-1.969	-3.261	0.148	0.133	-2.647	-3.159	0.404	0.294
GPPL	1	-1.510	-1.765	-3.145	-2.886	2.105	1.843	1.675	0.966
	2	-2.699	-3.162	0.209	0.243	-1.697	-1.504	-0.334	-0.193
GSFC	1	1.577	2.929	-0.759	-0.893	-2.012	-2.092	4.245	3.345
	2	-2.630	-5.175	-1.284	-1.244	-0.772	-0.807	2.661	2.149
GULFOILLUB	1	0.875	0.872	-2.016	-1.95	-0.080	-0.056	2.259	0.961
	2	-2.501	-2.525	1.896	3.01	1.528	1.101	-3.751	-1.639
HEG	1	0.292	0.612	-3.015	-5.09	0.677	0.860	2.146	1.893
	2	-3.727	-8.387	1.68	1.425	-2.392	-3.275	0.452	0.415
HIMACHLFUT	1	1.178	3.558	-0.75	-0.64	1.751	2.914	2.841	3.371
	2	-0.878	-2.783	0.684	1.19	-0.474	-0.830	0.630	0.755
HCC	1	1.181	3.761	-3.59	-6.643	2.901	4.785	2.538	2.976
	2	-0.514	-1.705	0.922	2.34	0.644	1.098	1.565	1.912
HINDCOPPER	1	-0.801	-1.457	-0.899	-2.392	-0.172	-0.218	4.085	3.562
	2	-4.535	-9.149	0.478	1.31	-3.582	-4.957	-0.506	-0.509
ICRA	1	3.659	2.548	-0.932	-2.673	3.520	1.721	9.704	3.041
	2	-1.539	-1.074	-1.05	-1.368	-2.277	-1.116	1.149	0.353
IDEA	1	0.177	0.696	-5.148	-7.545	0.634	2.244	1.043	2.870
	2	-0.910	-3.570	3.553	1.761	-0.706	-2.505	-0.487	-1.391
IFBIND	1	1.313	2.159	-1.029	-0.511	1.729	1.760	3.527	3.025
	2	-2.381	-4.025	0.116	0.333	-2.868	-3.015	-1.059	-0.927
IFCI	1	0.125	0.324	-0.357	-1.021	0.866	1.504	2.512	3.724
	2	-2.089	-5.704	1.692	2.222	-1.379	-2.576	1.229	1.871
IIFL	1	0.256	2.589	-1.454	-1.951	1.670	1.751	-0.231	-0.890
	2	1.135	3.691	0.002	0.004	-1.165	-1.231	-0.094	-0.364
INDIACEM	1	0.597	1.444	-1.96	-3.992	1.996	2.477	4.362	3.709
	2	-1.514	-3.781	0.375	0.735	-0.718	-0.961	0.971	0.893
IOB	1	0.600	1.131	-1.482	-2.969	1.423	1.774	6.312	4.550
	2	-2.771	-5.423	0.068	0.093	-3.894	-5.332	-3.203	-2.446

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
IGL	1	-0.142	-0.537	-1.256	-1.749	-0.891	-0.829	-0.018	-0.015
	2	-0.128	-0.482	-0.3	-0.943	-2.029	-1.924	0.482	0.403
INGERRAND	1	2.163	2.886	-0.153	-0.48	4.809	3.218	7.615	2.205
	2	-1.722	-2.407	1.242	1.471	-1.009	-0.730	2.355	0.688
INOXLEISUR	1	-0.289	-0.412	-0.981	-1.199	0.971	1.111	1.753	1.589
	2	-1.814	-2.665	0.535	0.587	-0.316	-0.367	0.159	0.147
IPCALAB	1	0.667	1.244	-0.417	-0.469	0.147	0.252	0.224	0.169
	2	-1.703	-3.190	1.701	1.972	-1.475	-2.546	-4.500	-3.571
ITD	1	0.375	1.373	-1.36	-1.582	0.645	0.716	0.620	0.537
	2	-0.095	-0.348	0.365	1.245	-2.579	-3.078	-2.448	-2.422
JKIL	1	-0.160	-0.304	0.202	0.682	2.733	3.260	2.964	2.532
	2	-0.587	-1.121	-0.056	-1.592	1.891	2.309	3.712	3.176
JBCHEPHARM	1	2.569	3.467	-0.148	-4.21	2.746	2.395	2.377	1.582
	2	-0.741	-1.026	2.971	3.201	-0.875	-0.769	-1.003	-0.683
JINDALSAW	1	1.970	5.114	-0.031	-0.035	2.118	2.964	1.982	2.067
	2	-1.236	-3.405	2.024	4.413	0.258	0.383	0.975	1.075
JSL	1	0.239	0.524	-1.594	-3.683	2.889	2.359	2.733	2.185
	2	-1.825	-4.115	0.27	0.568	0.193	0.159	0.370	0.300
JKCEMENT	1	0.649	0.660	-1.698	-3.676	0.573	0.425	2.033	1.005
	2	-1.497	-1.535	1.553	1.215	-1.096	-0.813	1.887	0.961
JKLAKSHMI	1	1.482	1.820	-0.216	-0.171	4.524	3.743	5.597	3.483
	2	-3.408	-4.221	0.872	0.843	-0.65	-0.542	2.506	1.579
JKTYRE	1	-0.027	-0.099	-3.419	-3.326	0.736	0.725	3.011	2.300
	2	-0.464	-1.723	-0.072	-0.27	-3.851	-3.996	-1.874	-1.483
JMFINANCIL	1	-0.119	-0.207	-0.099	-0.372	-0.794	-0.681	1.559	1.034
	2	-2.510	-4.519	0.647	0.991	-2.139	-1.898	-0.777	-0.553
JSWHL	1	0.311	0.306	-1.934	-3.055	2.344	1.349	5.261	3.135
	2	-4.739	-4.739	0.129	0.107	-1.955	-1.136	3.701	2.179
JUBILANTPHARMA	1	0.760	1.562	-4.469	-3.782	2.076	2.358	3.673	3.388
	2	-1.112	-2.354	-0.149	-0.254	0.047	0.055	0.811	0.779
JUSTDIAL	1	-0.987	-2.733	-1.714	-3.018	-0.852	-1.213	0.793	1.063
	2	-1.867	-5.262	-0.846	-2.013	-1.859	-2.813	-0.004	-0.006
JYOTHYLAB	1	-0.396	-0.507	-1.443	-3.457	2.642	1.658	4.162	2.391
	2	-0.612	-0.786	-0.528	-0.619	-2.505	-1.580	-2.630	-1.531
KPRMILL	1	-0.296	-0.719	0.275	0.323	-0.080	-0.173	2.136	1.246
	2	-0.024	-0.058	-0.035	-0.046	0.089	0.193	1.601	0.920
KAJARIACER	1	0.539	0.782	0.459	0.601	2.186	1.637	3.516	1.971
	2	-1.319	-1.920	0.489	0.607	-1.278	-0.964	1.246	0.694
KPIL	1	0.474	0.553	-0.982	-1.221	-0.410	-0.315	1.520	1.092
	2	-2.445	-2.896	2.16	2.042	-0.812	-0.634	1.335	0.977
KANSAINER	1	0.156	0.447	-1.092	-1.041	-2.12	-1.462	-0.262	-0.157
	2	-0.554	-1.584	0.283	0.766	1.491	0.987	3.360	2.006
KTKBANK	1	1.106	2.166	-0.562	-1.516	1.747	1.757	4.777	3.558
	2	-1.106	-2.227	1.286	2.137	-0.464	-0.497	2.858	2.332
KARURVYSYA	1	-0.116	-0.361	-1.085	-1.84	0.496	0.550	3.079	2.930
	2	-0.539	-1.680	-0.162	-0.459	-2.327	-2.702	-0.716	-0.681

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
KSCL	1	-0.941	-1.748	-0.164	-0.466	-0.248	-0.246	0.899	0.705
	2	-2.205	-4.126	-0.958	-1.492	-3.359	-3.433	-1.103	-0.899
KEC	1	1.901	3.060	-1.574	-2.465	3.680	3.037	4.741	3.468
	2	0.897	1.455	1.074	1.481	2.551	2.103	1.734	1.278
KNRCON	1	0.141	0.370	0.369	0.514	1.316	1.746	5.557	3.327
	2	-0.598	-1.567	0.033	0.077	-0.269	-0.361	1.075	0.650
KSB	1	0.147	0.147	-0.454	-1.038	-0.357	-0.239	2.070	1.168
	2	-2.526	-2.593	1.663	1.326	0.216	0.144	1.940	1.111
LMW	1	1.441	1.647	-1.82	-1.493	1.883	1.517	2.553	1.585
	2	-2.091	-2.430	-0.007	-0.175	-1.255	-1.024	-0.273	-0.169
POONAWALLA	1	2.166	3.403	-0.108	-2.478	4.014	4.212	5.899	4.541
	2	-1.171	-1.863	0.79	0.946	0.024	0.026	-0.487	-0.376
MAHSEAMLES	1	1.851	2.219	-2.135	-2.568	5.123	3.714	7.036	4.291
	2	-2.261	-2.751	-0.015	-0.405	-1.298	-0.949	0.951	0.583
MHRIL	1	0.722	1.055	-0.151	-3.874	1.759	1.646	3.638	2.288
	2	-3.171	-4.762	0.445	0.511	-2.469	-2.388	1.119	0.722
MAHLIFE	1	0.228	0.407	-2.928	-3.433	0.029	0.049	4.366	2.296
	2	-0.522	-0.938	1.28	1.047	-0.266	-0.45	4.524	2.334
MARKSANS	1	-0.457	-2.854	-1.36	-1.122	2.431	3.558	4.703	5.330
	2	0.635	4.125	2.367	3.453	-0.847	-1.285	1.854	2.150
PGHL	1	1.849	2.788	-0.222	-3.268	0.202	0.146	2.498	1.646
	2	0.138	0.213	2.122	2.795	-0.348	-0.246	0.544	0.363
NAVA	1	-0.408	-0.737	0.414	0.568	-0.296	-0.324	1.565	1.259
	2	-2.040	-3.820	-0.386	-0.561	-2.665	-3.125	-0.995	-0.837
NCC	1	0.141	0.387	-1.647	-2.46	-0.233	-0.388	0.856	1.497
	2	-1.190	-3.374	0.396	0.876	-0.667	-1.143	0.440	0.802
NCL	1	0.015	0.021	-1.3	-2.968	0.397	0.393	2.172	1.528
	2	-4.083	-5.664	0.244	0.254	-1.399	-1.421	2.152	1.525
NHPC	1	-1.359	-1.879	-4.347	-4.688	-2.162	-1.79	-2.298	-1.437
	2	-1.989	-2.787	-0.477	-0.525	-1.401	-1.187	-1.752	-1.114
NIITLTD	1	-0.067	-0.115	-2.047	-2.267	-0.208	-0.259	1.183	1.214
	2	-2.441	-4.277	0.445	0.564	-0.237	-0.303	0.711	0.750
NMDC	1	0.826	1.571	-3.381	-4.398	0.553	0.709	1.656	1.710
	2	-0.490	-0.941	1.475	2.212	-0.438	-0.575	1.238	1.348
RCF	1	1.522	2.341	0.327	0.492	1.973	1.635	2.643	2.297
	2	-3.744	-6.395	0.872	1.305	-2.05	-1.872	1.356	1.303
RATNAMANI	1	2.001	1.835	-3.813	-6.366	1.640	0.917	3.744	1.756
	2	-0.284	-0.265	2.468	1.842	2.443	1.38	4.797	2.294
RAYMOND	1	-0.215	-0.365	-0.469	-0.355	1.99	2.045	4.706	3.657
	2	-2.742	-4.881	-0.756	-1.028	0.375	0.401	1.978	1.599
REDINGTON	1	-0.019	-0.030	-3.274	-4.649	-0.225	-0.337	1.317	1.036
	2	-1.184	-1.941	0.497	0.506	-1.520	-2.350	-0.282	-0.236
SANOFI	1	-2.686	-1.694	-0.21	-0.216	-1.565	-0.896	0.989	0.435
	2	-3.126	-1.983	-0.956	-0.48	-2.788	-1.602	0.865	0.388
SCI	1	0.375	0.733	-1.516	-0.761	0.296	0.322	1.433	1.151
	2	-3.679	-7.986	1.304	2.193	-2.806	-3.34	-1.641	-1.458

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
SRTRANS	1	-1.385	-2.911	-2.534	-4.668	-0.860	-1.451	-0.226	-0.357
	2	-1.065	-2.242	-1.586	-2.413	-1.146	-1.949	0.534	0.839
SIMPLEXINF	1	2.270	3.548	-0.887	-1.35	3.821	4.213	5.093	3.393
	2	-2.119	-3.337	2.273	2.969	0.520	0.567	0.966	0.639
SKFINDIA	1	-1.893	-1.216	-1.107	-1.453	1.656	0.873	4.494	1.589
	2	-1.739	-1.121	-3.216	-1.446	-1.026	-0.541	2.091	0.728
SONATASOFTW	1	3.125	5.810	-1.575	-0.711	3.605	3.511	2.673	1.804
	2	-0.203	-0.390	2.97	4.738	-0.033	-0.033	0.512	0.348
SUNTV	1	-9.571	-3.980	-0.106	-0.173	-5.431	-4.993	2.57	0.277
	2	6.362	2.656	-1.68E	-4.957	-3.223	-2.988	8.00	0.870
SUNDRMFAST	1	1.195	1.630	7.08E	2.09	1.942	1.559	1.900	1.375
	2	-1.746	-2.436	0.725	0.807	-1.826	-1.486	-2.191	-1.603
SPLPETRO	1	1.426	2.058	-1.656	-1.893	2.650	2.421	5.298	3.418
	2	-1.645	-2.424	0.757	0.845	-0.887	-0.830	-0.257	-0.171
TATACHEM	1	0.314	0.652	-2.024	-2.304	0.612	1.225	0.910	1.566
	2	-0.228	-0.479	0.245	0.253	0.824	1.661	1.274	2.196
TDPOWERSYS	1	2.119	2.794	-1.356	-1.421	2.912	2.970	2.468	1.471
	2	-1.800	-2.254	1.618	1.5	-0.360	-0.350	1.771	1.072
RAMCOCEM	1	-1.082	-1.105	-2.544	-2.255	2.815	2.243	1.189	0.904
	2	-2.588	-2.652	-1.775	-1.442	-0.093	-0.073	0.685	0.521
THERMAX	1	-0.470	-0.412	-2.531	-2.067	3.341	1.918	-1.417	-0.435
	2	-1.048	-0.923	-2.522	-1.719	2.741	1.590	-1.773	-0.527
TTKPRESTIG	1	-0.208	-0.684	-2.897	-1.979	-0.019	-0.056	3.274	1.685
	2	-0.423	-1.394	0.058	0.057	-0.179	-0.518	3.013	1.565
UCOBANK	1	-0.108	-0.207	-0.005	-0.005	1.986	1.731	3.736	2.625
	2	-3.319	-6.719	-0.485	-0.835	-3.890	-3.875	-1.255	-0.975
USHAMART	1	0.735	1.684	-2.884	-5.134	0.899	1.128	1.778	1.575
	2	-1.332	-3.176	0.618	1.192	-2.172	-2.871	0.367	0.320
WABAG	1	1.934	4.193	-0.938	-1.874	5.120	6.498	5.839	5.356
	2	-1.155	-2.538	0.794	1.455	-0.290	-0.378	0.798	0.743
VTLLTD	1	-0.023	-0.049	-1.308	-2.41	-0.162	-0.353	4.442	1.931
	2	-0.597	-1.276	2.452	1.857	-0.365	-0.797	3.563	1.534
VESUVIUS	1	0.696	0.562	-1.028	-0.779	3.303	1.731	7.032	2.850
	2	-3.654	-2.989	-0.034	-0.022	-4.446	-2.354	1.128	0.460
VINATIORGA	1	0.446	0.742	-2.292	-1.479	0.454	0.674	0.806	1.104
	2	-1.012	-1.698	2.343	2.666	0.618	0.919	1.326	1.807
VSTIND	1	-0.636	-0.514	-0.131	-0.15	1.399	0.731	2.840	1.203
	2	-3.687	-2.987	-0.235	-0.158	1.744	0.920	2.203	0.941
WABCO	1	-1.454	-1.384	-3.995	-2.699	0.777	0.383	1.280	0.429
	2	-3.209	-3.081	-2.121	-1.745	-2.223	-1.109	0.202	0.069
WELCORP	1	1.211	2.394	-3.465	-2.868	0.321	0.512	3.100	3.081
	2	-2.074	-4.235	1.471	2.386	-0.469	-0.749	2.535	2.583
WELSPUNLIV	1	0.308	1.193	-1.639	-2.737	0.287	0.165	3.243	3.307
	2	-0.902	-3.503	0.086	0.308	0.805	0.461	2.349	2.545
WHIRLPOOL	1	0.526	0.633	-0.959	-3.416	-0.107	-0.089	2.921	2.123
	2	-0.813	-0.987	1.872	1.811	0.083	0.069	3.156	2.390

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
WOCKPHARMA	1	0.895	2.285	0.26	0.253	1.402	1.853	3.608	3.402
	2	-0.598	-1.604	0.919	2.165	-0.864	-1.214	0.424	0.420
ZEEL	1	-0.889	-2.130	0.175	0.43	0.342	0.727	0.238	0.384
	2	-1.333	-3.206	-1.472	-2.449	-0.854	-1.876	0.579	0.934
ZENSARTECH	1	0.017	0.044	-1.08	-1.795	1.193	1.083	3.144	2.124
	2	-0.959	-2.442	-0.058	-0.146	-2.682	-2.529	-0.688	-0.472
ZYDUSWELL	1	-1.203	-1.195	-0.701	-1.769	1.468	0.819	4.512	1.988
	2	-4.552	-4.651	-0.35	-0.309	-4.876	-2.743	-3.761	-1.653
ABAN	1	2.731	3.201	-1.902	-1.723	4.593	5.957	5.361	5.522
	2	-1.122	-1.345	1.304	2.881	-1.055	-1.36	-0.269	-0.267
SUNDROP	1	4.742	1.940	-1.89	-4.484	2.977	2.187	2.644	1.700
	2	-2.912	-1.180	1.034	0.827	-0.241	-0.181	2.209	1.466
ALLCARGO	1	2.617	1.368	0.242	0.194	2.977	2.187	2.706	1.602
	2	-2.402	-1.305	0.266	0.402	-0.241	-0.181	0.299	0.194
ANSALPI	1	1.997	1.899	-2.183	-3.364	0.806	0.762	1.814	1.264
	2	1.262	1.199	2.47	4.743	-1.935	-1.958	1.145	0.795
AUTOAXLES	1	-0.538	-0.223	-0.166	-0.319	2.169	1.878	3.740	2.250
	2	2.385	1.000	-1.099	-0.96	-1.057	-0.992	-1.982	-1.305
BAJAJCON	1	1.238	0.586	-3.416	-3.026	2.864	3.187	3.501	2.784
	2	-3.781	-1.824	-0.916	-0.76	-1.972	-2.211	-2.502	-2.011
BAJAJELEC	1	2.457	1.717	-2.222	-1.847	2.282	2.046	5.028	2.584
	2	-0.942	-0.670	2.488	3.346	-0.218	-0.202	-2.489	-1.390
BAJAJHIND	1	2.008	2.381	-1.744	-2.403	2.295	3.464	1.079	1.067
	2	-1.531	-1.949	1.102	2.352	0.626	0.944	0.669	0.669
BALMERLAWRIE	1	2.379	1.645	-1.978	-4.56	1.873	1.891	1.404	1.173
	2	-0.871	-0.647	0.315	0.95	-1.181	-1.316	-0.905	-0.811
BALRAMCHIN	1	-0.220	-0.153	-0.314	-0.953	1.356	1.654	2.082	1.568
	2	-1.587	-1.132	-0.392	-0.653	-0.348	-0.449	-0.980	-0.779
BATAINDIA	1	0.242	0.156	-2.116	-3.73	1.146	0.859	-0.205	-0.118
	2	-4.409	-2.845	0.434	0.761	-1.870	-1.431	-2.983	-1.742
BGREENERGY	1	1.874	2.144	-1.254	-2.21	2.258	3.355	2.820	2.812
	2	-1.359	-1.603	0.516	0.837	0.098	0.154	-0.142	-0.153
BLUESTARCO	1	3.138	1.179	-3.165	-5.536	1.776	1.262	0.899	0.430
	2	3.686	1.411	1.491	1.104	-0.135	-0.095	0.723	0.344
BOMBAYDYEING	1	-2.253	-1.613	-0.122	-0.091	2.646	3.505	3.136	2.593
	2	0.049	0.923	0.976	2.516	-2.224	-3.371	-2.359	-2.247
CARERATING	1	3.847	1.526	-1.055	-2.841	0.500	0.518	0.832	0.679
	2	-0.269	-0.106	-0.482	-0.458	-0.196	-0.207	-0.239	-0.199
CENTENKA	1	8.675	5.371	0	0	1.033	0.958	0.374	0.207
	2	0.912	0.525	1.854	2.364	-2.911	-2.891	-2.013	-1.200
CHENNPETRO	1	2.078	1.789	-0.361	-0.474	0.149	0.177	0.343	0.244
	2	-0.424	-0.376	0.232	0.412	-1.896	-2.318	-1.677	-1.284
CIPL	1	2.350	1.357	-2.141	-3.934	2.445	2.827	2.128	1.888
	2	-1.724	-1.048	0.309	0.327	-2.041	-2.528	-2.668	-2.526
DBCORP	1	1.808	0.833	-1.398	-1.507	-0.305	-0.270	1.820	0.984
	2	-0.033	-0.015	-3.525	-1.809	-2.076	-1.895	2.133	1.153

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
DCBBANK	1	3.314	2.699	-0.559	-0.287	-0.487	-0.542	-0.713	-0.578
	2	-0.457	-0.391	-1.763	-2.822	-0.775	-0.873	0.035	0.030
DELTACORP	1	3.369	3.437	-0.104	-0.166	1.559	1.982	2.012	1.878
	2	0.738	0.803	0.191	0.401	1.070	1.395	3.365	3.236
DEN	1	1.584	1.034	-1.685	-3.713	1.503	1.530	3.423	2.377
	2	0.774	0.508	1.577	2.605	-1.070	-1.122	0.421	0.306
DHANBANK	1	3.025	2.840	-0.623	-1.046	3.070	3.598	3.660	3.290
	2	-1.204	-1.188	1.627	2.812	0.509	0.645	0.788	0.771
DREDGECORP	1	3.50	3.392	-1.333	-2.392	2.690	2.345	1.616	0.902
	2	-1.508	-1.562	-0.941	-1.278	-3.351	-3.352	-3.692	-2.356
DYNAMATECH	1	1.252	1.018	-4.868	-7.615	2.256	2.283	3.043	1.831
	2	0.14	0.123	1.63	2.21	-1.788	-1.897	-2.701	-1.688
ENIL	1	1.140	0.422	0.483	0.66	1.121	0.878	4.041	1.779
	2	1.286	0.508	2.055	1.34	-2.717	-2.126	-2.180	-0.954
EROSMEDIA	1	1.342	1.121	-0.679	-0.445	1.927	3.192	1.821	2.266
	2	0.023	0.020	-0.434	-0.961	0.230	0.382	0.433	0.532
FEDERALMOGUL	1	1.877	2.245	-1.434	-3.221	1.745	1.181	4.006	1.883
	2	-1.252	-1.512	-0.431	-0.353	-4.302	-2.971	-1.718	-0.830
FMGOETZE	1	-0.862	-0.882	-2.668	-2.282	6.186	6.396	3.645	3.396
	2	-0.951	-0.970	1.185	2.593	1.155	1.246	-0.070	-0.071
FLEXITUFF	1	-1.07	-1.833	-1.449	-3.297	3.785	3.389	3.785	3.389
	2	4.723	0.854	2.336	4.203	0.634	0.557	0.634	0.557
FCONSUMER	1	-1.111	-2.568	0.965	1.725	3.263	3.214	1.10	0.362
	2	7.943	1.946	3.11E	11.257	-2.424	-0.238	-6.533	-2.145
FRETAIL	1	2.273	2.367	-2.763	-10.40	1.290	1.297	1.564	0.962
	2	-0.911	-0.953	0.599	2.077	0.423	0.426	0.562	0.357
GAMMONIND	1	2.072	1.998	-0.072	-0.251	2.148	2.955	3.646	4.643
	2	0.572	0.568	0.683	2.083	1.133	1.571	1.519	1.916
GATILTD	1	0.879	0.652	-0.1	-0.307	1.073	1.479	1.265	1.169
	2	0.809	0.599	2.173	4.825	-0.635	-0.942	0.958	0.939
GDL	1	0.677	0.388	-0.892	-2.08	0.613	0.516	3.269	1.732
	2	0.971	0.555	-0.911	-0.979	-3.054	-2.621	-3.349	-1.786
GEOJITHFSL	1	3.402	2.699	-0.643	-0.697	2.989	3.864	3.300	3.148
	2	0.166	0.136	2.28	3.729	-0.066	-0.090	1.299	1.283
GREAVESCOT	1	2.064	1.124	-1.16	-1.928	-1.562	-1.634	-0.585	-0.311
	2	-0.232	-0.122	0.143	0.142	-3.461	-3.870	-1.719	-0.930
GTLINFRA	1	1.182	2.018	-1.966	-1.982	-0.226	-0.254	-0.226	-0.254
	2	1.321	2.242	1.137	3.445	0.120	0.135	0.120	0.135
HATHWAY	1	-1.420	-2.321	-0.347	-1.052	2.806	3.847	3.294	3.714
	2	-0.693	-1.124	-0.765	-1.667	-2.023	-3.004	-0.671	-0.831
HCL-INSYS	1	2.190	3.050	-0.755	-1.649	3.349	4.688	2.341	2.477
	2	-0.620	-0.930	1.361	2.956	1.027	1.403	1.709	1.755
HERITGFOOD	1	7.035	5.247	-2.856	-6.828	0.031	0.031	0.920	0.653
	2	-1.999	-1.538	0.478	0.772	-2.376	-2.480	-0.440	-0.326
HIMATSEIDE	1	1.942	1.303	-0.694	-1.134	1.642	2.018	1.385	1.175
	2	0.379	0.273	0.637	0.741	-0.816	-1.028	-1.061	-0.936

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
HOEC	1	2.088	2.590	-1.97	0.72	2.118	2.637	3.691	2.958
	2	-0.135	-0.190	0.958	1.781	-1.777	-2.321	0.027	0.023
THELEELA	1	3.404	3.266	-1.624	-3.361	2.019	3.119	1.124	1.105
	2	-0.465	-0.487	3.051	5.527	0.184	0.285	0.156	0.152
HSIL	1	4.544	2.807	-1.509	-2.865	0.542	0.449	1.015	0.806
	2	2.680	1.727	0.972	2.895	-0.359	-0.325	-0.440	-0.384
HTMEDIA	1	-0.056	-0.027	0.407	1.214	2.204	2.637	2.815	2.871
	2	-2.118	-1.029	1.676	1.882	-0.898	-1.132	0.590	0.609
INDIABULLS	1	1.814	1.795	-0.254	-0.288	-0.459	-0.678	0.240	0.281
	2	0.488	0.493	1.759	4.044	0.973	1.453	2.162	2.572
JAGRAN	1	2.725	0.793	0	0.001	3.754	3.041	4.33	2.261
	2	-1.732	-0.501	-0.169	-0.12	-0.859	-0.736	2.160	1.153
JAICORPLTD	1	3.385	3.940	-0.07	-0.05	0.789	0.863	1.455	0.893
	2	0.127	0.154	1.033	1.862	-1.809	-2.259	-2.842	-2.032
JISLDVREQS	1	0.690	0.962	-2.309	-4.766	1.670	2.651	1.695	2.523
	2	-1.641	-2.331	0.67	1.576	1.038	1.696	1.540	2.382
JPINFRATEC	1	1.375	1.724	-0.176	-0.418	1.722	1.561	1.025	0.804
	2	-0.574	-0.751	0.07	0.179	1.043	0.955	1.097	0.864
JPPOWER	1	-0.951	-0.970	-0.117	-0.3	-0.226	-0.254	2.803	2.925
	2	-1.07	-1.833	-0.361	-1.526	1.251	1.053	-0.336	-0.350
J&KBANK	1	-0.246	-0.938	-0.052	-0.222	2.354	3.246	5.173	4.241
	2	0.294	1.171	0.717	2.129	-1.028	-1.435	1.522	1.243
JBFIND	1	1.307	0.884	0.425	1.275	4.391	3.790	-0.870	-0.490
	2	-2.453	-1.826	2.265	4.508	1.556	1.346	-6.775	-4.091
JYOTISTRUC	1	2.034	2.439	0.027	0.055	-2.072	1.243	0.548	0.443
	2	-1.177	-1.409	0.004	0.007	0.671	0.521	-2.729	-2.649
KCP	1	2.725	2.404	-2.47	-3.678	-0.603	-0.547	1.693	1.017
	2	0.033	0.030	2.622	5.317	-3.947	-3.808	-1.994	-1.272
KILPP	1	3.028	2.799	-1.063	-2.314	0.235	0.283	2.525	1.788
	2	-0.731	-0.745	2.917	1.391	-2.797	-3.758	-2.859	-2.166
KKCL	1	1.756	0.450	2.406	1.142	0.339	0.706	1.693	1.017
	2	-2.582	-0.660	0.89	1.98	0.536	1.108	-1.994	-1.272
KITEX	1	3.126	2.722	-1.032	-2.33	2.034	2.399	-0.260	-0.163
	2	-1.437	-1.307	1.502	2.18	-2.904	-3.600	-1.921	-1.356
KOLTEPATIL	1	1.807	1.541	-3.753	-5.881	-0.986	-0.811	2.435	1.487
	2	-1.414	-1.279	1.007	1.852	-4.365	-3.918	-2.288	-1.460
LGBBROSLTD	1	0.868	1.280	-0.157	-0.291	-1.167	-1.028	3.455	2.383
	2	0.566	0.800	0.358	0.929	-3.695	-3.615	2.352	1.683
LAOPALA	1	0.418	0.910	0.081	0.212	0.611	0.517	-0.656	-0.418
	2	0.154	0.334	1.441	1.439	-2.893	-2.635	-6.658	-5.044
MAHSCOOTER	1	3.604	1.403	0.177	0.178	2.640	2.182	1.567	0.965
	2	0.845	0.335	1.909	1.935	1.251	1.053	-1.787	-1.171
MANGCHEFER	1	0.194	0.083	-2.214	-2.275	0.906	0.900	-0.393	-0.425
	2	-0.554	-0.241	-0.274	-0.402	1.425	1.416	0.089	0.096
MRPL	1	4.316	2.890	-3.145	-4.773	-0.117	-0.114	0.970	0.691
	2	-1.210	-0.887	1.319	1.758	-2.687	-2.825	1.499	1.075

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
MAXINDIA	1	2.058	1.191	-0.979	-1.312	-0.150	-0.187	2.817	2.611
	2	-1.662	-0.974	1.156	1.111	0.347	0.434	0.269	0.249
MAYURUNIQ	1	0.384	0.210	-0.277	-0.268	0.361	0.369	1.150	2.537
	2	-2.058	-1.149	1.002	1.962	0.083	0.086	0.021	0.049
MBLINFRA	1	5.773	3.456	-0.519	-1.021	3.461	4.033	1.056	1.070
	2	2.962	1.766	0.714	1.015	-0.599	-0.702	1.772	1.816
MCLEODRESS	1	3.517	1.987	-0.32	-0.459	1.085	2.679	-0.014	-0.009
	2	1.750	0.963	0.951	1.886	-0.055	-0.140	-2.058	-1.591
MERCATOR	1	2.593	2.713	-0.231	-0.463	-0.900	-1.047	-1.215	-0.740
	2	1.089	1.191	1.193	2.096	-4.310	-5.901	-1.848	-1.178
MMTC	1	3.050	2.754	-2.774	-5.683	-0.749	-0.596	4.969	3.835
	2	-2.187	-2.206	-0.165	-0.298	-2.853	-2.464	1.517	1.181
MOIL	1	3.975	2.229	-1.63	-3.012	3.932	5.365	3.542	1.986
	2	-0.889	-0.506	2.789	4.595	-0.763	-1.062	0.387	0.231
MTEDUCARE	1	3.572	2.262	-1.53	-2.608	1.267	0.999	-0.212	-0.209
	2	-1.810	-1.216	0.62	0.686	-1.616	-1.347	-1.216	-1.251
MUNJALSHOW	1	3.333	2.508	-2.291	-2.601	1.267	0.999	0.694	0.431
	2	3.078	2.355	-0.138	-0.527	-1.616	-1.347	-0.307	-0.197
NBCC	1	0.326	0.320	-0.705	-2.697	0.014	0.020	5.857	3.893
	2	-2.201	-2.282	3.349	2.91	-1.537	-2.256	0.391	0.258
NAVNETEDUL	1	5.190	2.128	-1.504	-1.334	0.157	0.115	3.115	2.827
	2	-0.125	-0.054	2.696	4.794	-2.858	-2.236	0.394	0.384
NDTV	1	2.436	2.487	-1.013	-1.83	5.228	5.614	3.161	2.172
	2	-0.838	-0.968	0.995	1.844	-0.466	-0.504	0.345	0.244
NETWORK18	1	1.407	1.347	-1.002	-1.929	1.883	2.569	1.572	1.102
	2	-0.875	-0.946	2.579	4.793	-0.193	-0.289	-2.301	-1.784
NIITLTD	1	3.124	3.239	-0.942	-1.842	3.272	4.197	3.966	3.119
	2	-0.953	-1.037	1.129	2.095	-1.501	-1.974	1.148	0.900
NOCIL	1	1.206	1.361	-1.817	-3.665	1.082	1.115	6.604	2.708
	2	-1.154	-1.456	-0.002	-0.003	-2.618	-2.904	-4.028	-1.636
NOIDATOLL	1	2.478	1.569	-0.334	-0.54	3.522	3.405	-1.143	-0.682
	2	-0.052	-0.035	-1.741	-1.48	1.433	1.397	1.818	1.094
OMAXE	1	1.951	1.097	2.83	2.405	1.438	1.065	6.124	5.035
	2	-0.695	-0.397	1.745	4.487	-1.236	-0.921	1.282	1.034
OPTOCIRCUI	1	2.745	3.033	-0.253	-0.686	-1.143	-0.682	2.596	3.011
	2	0.169	0.203	1.747	3.123	1.818	1.094	0.507	0.600
OSWALSEEDS	1	2.173	2.356	-1.203	-2.207	3.08	4.162	2.577	2.891
	2	-1.144	-1.383	0.943	1.775	-1.436	-2.002	-0.386	-0.445
PARSVNATH	1	2.003	1.872	0.173	0.327	2.596	3.011	4.063	4.397
	2	1.913	1.784	3.109	6.304	0.507	0.600	2.217	2.341
PATELENG	1	4.936	4.646	-0.958	-2.011	2.027	3.008	2.189	2.464
	2	-0.849	-0.840	0.719	1.356	-1.997	-3.144	-0.334	-0.384
PENINLAND	1	3.347	2.742	-2.008	-3.907	2.686	4.054	-0.740	-0.504
	2	-0.255	-0.214	1.829	3.416	1.478	2.190	-2.465	-1.892
PENIND	1	1.201	0.948	-1.26	-2.455	1.632	2.428	0.881	1.325
	2	-2.793	-2.401	0.694	1.161	-0.789	-1.218	0.715	1.037

Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
PRAJIND	1	2.442	2.092	-2.081	-3.839	0.411	0.477	2.651	2.213
	2	-1.035	-0.942	0.032	0.07	-1.884	-2.357	1.286	1.097
PRAKASH	1	1.504	1.742	-0.796	-1.781	1.005	1.842	2.403	1.812
	2	-0.184	-0.215	2.828	3.994	-0.063	-0.116	-0.624	-0.502
PRISMJOHNSN	1	2.836	2.102	-0.013	-0.02	2.399	2.531	-0.074	-0.042
	2	1.216	0.931	1.064	2.111	0.919	0.986	-1.580	-0.916
PFS	1	1.398	1.130	-1.744	-3.529	1.278	1.314	2.883	1.841
	2	-0.734	-0.600	0.2	0.295	0.266	0.277	-0.168	-0.114
PTC	1	1.926	1.646	-1.043	-1.549	1.155	1.161	1.375	0.959
	2	-1.033	-0.890	-0.14	-0.191	-0.156	-0.162	-0.653	-0.460
PURVA	1	1.086	0.676	-2.421	-3.406	1.195	1.219	1.673	0.905
	2	-2.373	-1.502	1.324	1.974	-1.774	-1.939	-4.077	-2.356
RAJESHEXPO	1	1.820	1.517	-2.043	-3.127	1.279	1.071	2.839	1.767
	2	0.046	0.043	-0.679	-0.713	-2.261	-1.949	0.473	0.291
RALLIS	1	0.629	0.386	-1.63	-1.731	1.546	1.227	0.308	0.430
	2	-3.239	-2.042	2.606	4.428	-2.863	-2.382	0.565	0.790
RAMCOIND	1	2.853	2.284	-1.764	-3.243	2.360	2.074	3.920	3.866
	2	-1.59	-1.465	0.957	2.327	-0.053	-0.047	-1.401	-1.434
RTNINDIA	1	2.257	2.277	-0.022	-0.055	0.842	1.333	4.231	4.467
	2	0.536	0.543	4.048	7.584	0.501	0.797	-1.696	-1.770
ORISSAIND	1	2.909	2.953	-0.815	-1.655	2.881	4.089	0.484	0.522
	2	-0.686	-0.735	0.669	2.091	-1.582	-2.370	0.374	0.404
RELCAPITAL	1	0.565	0.842	-0.514	-1.611	4.108	5.069	1.354	0.908
	2	-0.490	-0.734	0.278	0.896	-0.865	-1.061	-2.596	-1.971
RCOM	1	1.099	1.381	-0.525	-1.689	0.854	1.176	3.956	3.955
	2	-1.161	-1.396	0.342	0.484	0.508	0.699	-0.098	-0.099
RELIANCE	1	-2.72	-2.352	-2.75	-4.546	0.494	0.596	2.278	1.965
	2	-2.230	-1.967	-0.014	-0.044	-2.238	-3.049	-1.642	-1.449
RELINFRA	1	0.000	0.211	0.019	0.06	2.791	4.601	4.636	2.976
	2	-0.002	-0.834	0.29	0.965	0.961	1.578	0.109	0.069
RPOWER	1	0.59	0.750	-0.328	-1.083	2.500	3.211	3.230	2.488
	2	0.661	0.833	0.213	0.228	0.930	1.205	2.821	2.286
RELIGARE	1	0.252	0.272	-2.448	-2.628	1.758	2.039	2.695	2.503
	2	0.014	0.015	-0.294	-0.315	-2.080	-2.450	1.532	1.392
REPCOHOME	1	6.306	2.543	-1.731	-1.868	1.808	2.153	2.789	2.711
	2	-2.516	-0.998	0.779	1.498	1.539	1.889	0.193	0.195
ROLTA	1	2.407	1.752	-0.995	-1.958	2.695	2.503	-0.312	-0.144
	2	-3.288	-2.640	2.364	2.289	1.532	1.392	-2.340	-1.091
SADBHAV	1	4.946	2.792	0.03	0.029	2.431	3.667	2.934	1.490
	2	-0.243	-0.139	3.535	3.482	0.002	0.003	-6.61	-3.775
SEINVEST	1	1.98	1.782	-0.362	-0.359	-0.303	-0.226	2.282	1.082
	2	-0.244	-0.218	3.3	3.247	-3.049	-2.287	-1.348	-0.651
SHANTIGEAR	1	6.877	4.363	-3.696	-3.843	1.500	1.128	2.742	2.734
	2	-1.703	-1.110	0.04	0.031	-6.466	-5.388	1.165	1.161
SHOPPERSTOP	1	-1.84	-0.662	-0.038	-0.029	2.335	1.874	2.918	2.319
	2	-5.070	-1.861	1.162	2.101	-2.148	-1.782	0.826	0.648

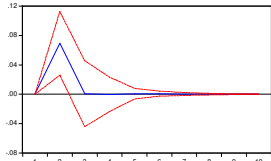
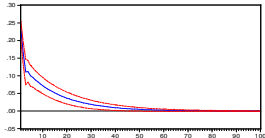
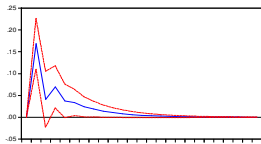
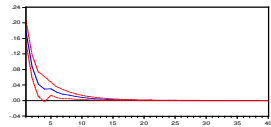
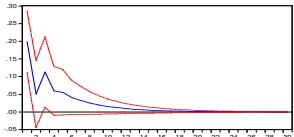
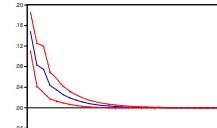
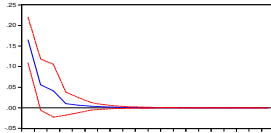
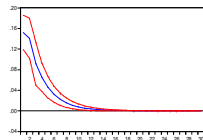
Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
RENUKA	1	3.111	3.277	-2.461	-4.759	3.562	4.949	1.925	1.415
	2	0.497	0.545	0.127	0.15	0.897	1.27	-2.340	-1.885
SOBHA	1	1.477	0.915	-3.561	-4.307	1.761	2.057	0.537	0.562
	2	-3.910	-2.401	0.59	0.773	-0.013	-0.016	-0.298	-0.320
JTEKT	1	2.418	2.028	-2.657	-3.588	1.066	1.022	3.693	4.108
	2	-0.546	-0.485	-0.157	-0.247	-2.676	-2.770	2.081	2.248
SOUTHBANK	1	3.02	2.272	-0.74	-1.165	1.460	2.093	3.334	3.369
	2	0.297	0.230	0.303	0.655	-1.034	-1.519	0.834	0.911
SREINFRA	1	-0.004	-1.004	-1.15	-2.544	1.340	2.395	-0.045	-0.030
	2	-0.004	-0.978	1.765	4.183	-0.671	-1.200	-1.470	-1.068
STLTECH	1	3.772	3.864	-1.059	-2.574	3.51	4.661	0.267	0.205
	2	-0.723	-0.757	1.973	3.488	-0.864	-1.218	-1.510	-1.201
SPARC	1	1.519	1.512	-1.41	-2.621	0.665	0.678	-0.988	-3.416
	2	-0.692	-0.757	-0.061	-0.106	-2.360	-2.648	-0.179	-0.620
SUNTECH	1	1.310	0.771	-1.117	-1.956	-0.951	-3.976	-0.401	-0.354
	2	-3.689	-2.192	2.18	3.976	-0.271	-1.147	-1.761	-1.707
SUVEN	1	3.864	4.429	-1.242	-2.407	1.442	1.443	3.128	1.764
	2	0.868	1.094	0.532	1.092	-1.487	-1.639	-1.363	-0.808
SWANCORP	1	-2.280	-1.936	-0.041	-0.086	1.355	0.984	1.562	0.724
	2	-1.351	-1.124	-0.773	-0.619	-1.358	-1.020	0.951	0.459
SWARAJENG	1	-2.173	-0.764	-1.671	-1.349	2.074	1.616	2.687	1.343
	2	-3.344	-1.167	1.253	1.525	-0.816	-0.674	-2.635	-1.440
TNPL	1	5.332	2.524	-1.158	-1.434	0.129	0.103	-0.614	-0.458
	2	-3.815	-1.840	0.206	0.997	-4.799	-4.327	0.123	0.099
TATACOFFEE	1	0.218	0.972	0.008	0.039	0.509	0.591	3.371	3.400
	2	0.144	0.652	1.122	1.555	-0.334	-0.405	1.135	1.156
TATASTLLP	1	1.653	1.343	-3.77	-5.863	3.57	5.060	2.007	1.792
	2	-2.930	-2.805	1.634	2.716	0.659	0.937	0.352	0.320
THOMASCOOK	1	4.276	2.602	-1.187	-1.982	2.007	1.792	2.070	1.179
	2	-1.934	-1.266	1.312	2.408	0.352	0.320	-4.599	-2.816
TREEHOUSE	1	-0.913	-0.514	-0.285	-0.528	2.262	2.211	2.968	3.465
	2	-1.447	-0.802	1.336	1.829	-4.195	-4.490	-0.347	-0.432
TBZ	1	4.027	2.915	-2.422	-3.56	3.868	5.460	2.869	3.671
	2	0.725	0.612	-0.354	-1.552	-0.787	-1.118	0.049	0.064
TRIDENT	1	1.391	1.473	-0.329	-1.442	1.662	2.781	-4.792	-2.610
	2	-0.211	-0.229	1.672	3.538	-1.057	-1.905	-3.782	-2.146
TV18BRDCST	1	2.381	1.749	-0.589	-1.272	-0.976	-0.796	0.798	0.350
	2	-0.666	-0.523	0.182	0.267	-2.823	-2.366	-1.849	-0.877
TVTODAY	1	1.761	1.389	-2.166	-3.292	0.908	0.714	1.730	1.318
	2	0.209	0.175	0.496	0.71	-2.064	-1.767	-1.075	-0.871
UFLEX	1	2.034	1.650	-2.996	-4.442	1.437	1.713	3.617	3.271
	2	-0.756	-0.662	2.243	2.471	-1.092	-1.374	1.498	1.371
UNICHEMLAB	1	1.295	0.761	-2.716	-3.052	3.617	3.271	2.233	1.577
	2	-1.577	-0.927	2.666	4.533	1.498	1.371	0.443	0.314
UTTAMSTL	1	6.758	4.755	-1.087	-1.962	0.015	0.035	1.895	1.846
	2	-0.474	-0.354	2.399	2.425	0.027	0.065	0.951	0.928

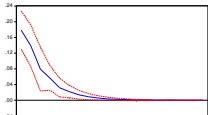
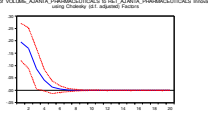
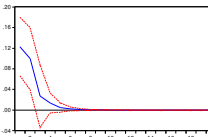
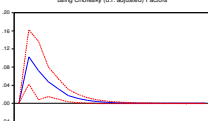
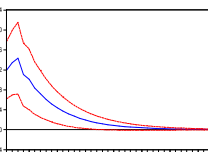
Symbol	Lag	2014-22		White swan		Grey swan		Black swan	
		Coeff	t stat	Coeff	t stat	Coeff	t stat	Coeff	t stat
VAIBHAVGBL	1	2.663	1.388	-1.232	-1.244	1.028	1.483	0.549	0.342
	2	-1.396	-0.739	0.959	2.588	-0.590	-0.857	0.457	0.314
VAKRANGEE	1	0.00	0.003	-0.965	-2.599	1.028	1.483	2.529	1.366
	2	-1.700	-0.993	2.59	3.741	-0.590	-0.857	-3.562	-1.973
VIPIND	1	4.228	3.109	-2.982	-4.582	1.749	1.571	1.510	1.201
	2	-1.946	-1.512	1.133	1.572	-0.819	-0.799	-0.988	-3.416
WHEELS	1	4.807	2.689	-2.448	-3.542	1.725	1.365	-0.179	-0.620
	2	-2.657	-1.724	-1.381	-1.138	-3.894	-3.155	0.401	0.354

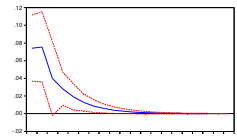
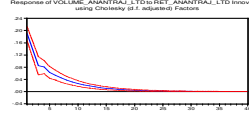
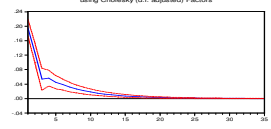
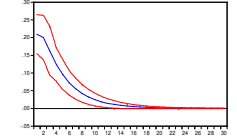
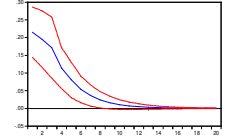
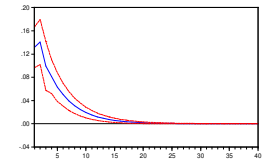
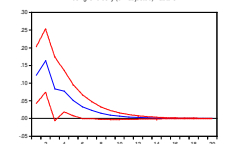
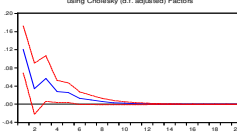
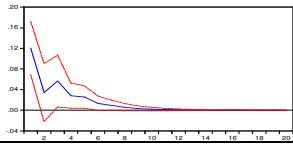
Source: Computed data

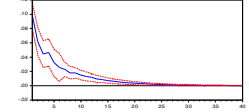
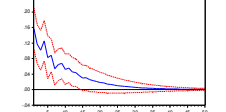
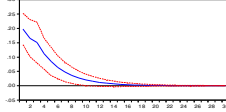
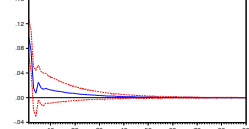
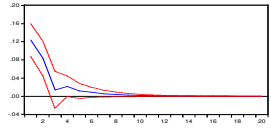
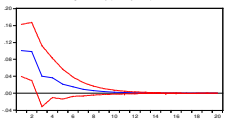
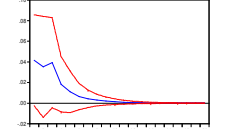
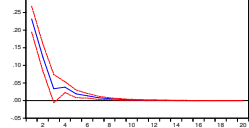
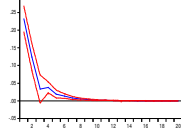
Appendix II

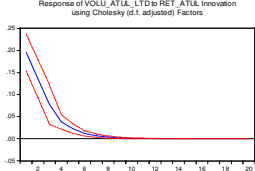
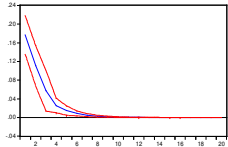
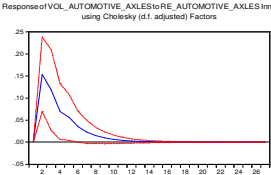
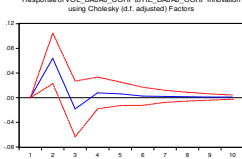
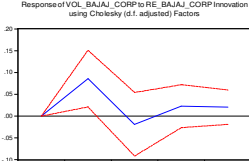
IRF Graphs of DE Over 2014-22, White Swan, Grey Swan and Black Swan Phases

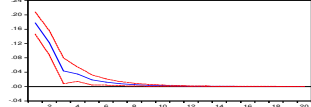
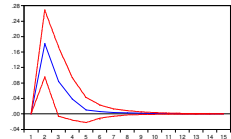
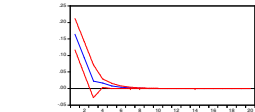
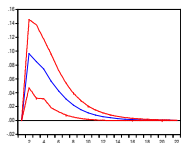
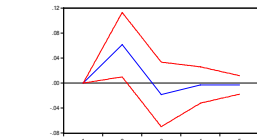
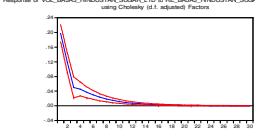
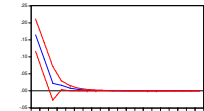
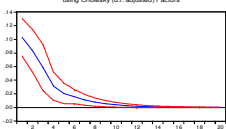
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
1	3MINDIA	No effect	No effect	No effect	No effect
2	ABAN	Response of VOL_ABAN_OFFSHORE to RE_ABAN_OFFSHORE Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ABAN_OFFSHORE to RE_ABAN_OFFSHORE Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ABAN_OFFSHORE to RE_ABAN_OFFSHORE Innovation using Cholesky (d.f. adjusted) Factors 	No effect
3	ABB	Response of VOLU_ABB_INDIA_LTD. to RET_ABB_INDIA_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	Response of VOLU_ABB_INDIA_LTD. to RET_ABB_INDIA_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
4	ACC	No effect	No effect	Response of VOLU_ACC_LTD. to RET_ACC_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_ACC_LTD. to RET_ACC_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
5	ADANIENT	No effect	No effect	Response of VOLU_ADANI_ENTERPRISES_LTD. to RET_ADANI_ENTERPRISES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No effect
6	ADANIPORTS	No effect	No effect	No effect	No effect
7	SUNDROP	No effect	No effect	No effect	No effect
8	AIAENG	No effect	No effect	No effect	No effect

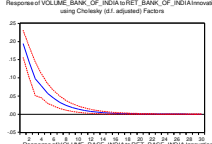
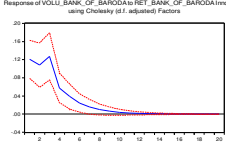
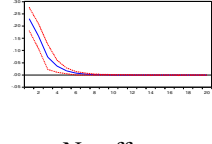
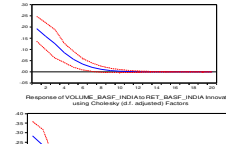
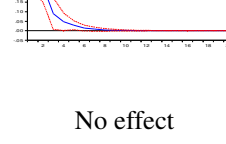
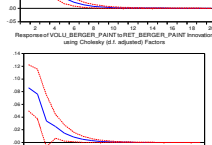
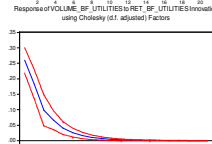
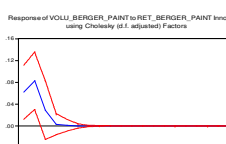
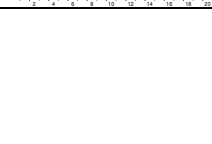
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
9	AJANTAPHARM	No Effect	No Effect		
10	AKZOINDIA	No Effect	No Effect		No Effect
11	APLLTD	No Effect	No Effect	No Effect	No Effect
12	ALLCARGO	No effect	No Effect		No effect
13	ALSTOM	No effect	No effect		No effect
14	ALSTOMTD	No effect	No effect	No effect	No effect
15	ARE&M	No Effect		No Effect	No Effect

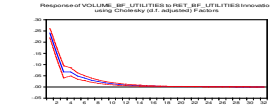
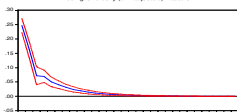
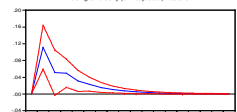
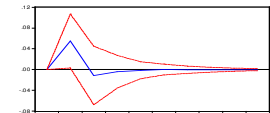
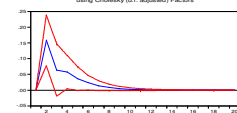
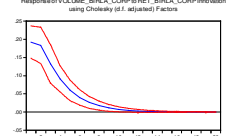
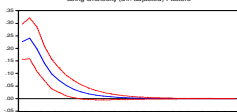
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
1 6	AMBUJACEM	No Effect	No Effect		No Effect
1 7	ANANTRAJ				
1 8	ANSALPI	No effect		No effect	No effect
1 9	APARIND	No effect	No effect	No effect	
2 0	APOLLOHOSP	No effect	No effect		

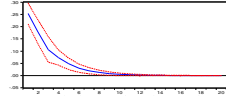
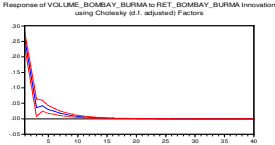
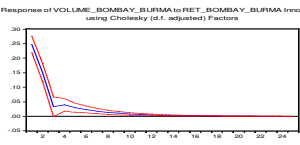
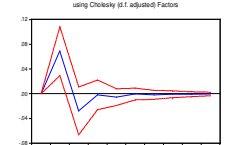
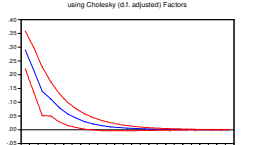
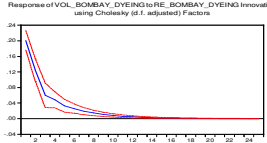
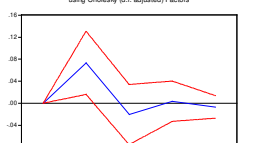
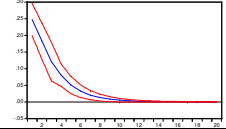
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
2 1	APOLLOTYRE	Response of VOLU_APOLLO_TYRES_LTD. to RET_APOLLO_TYRES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOLU_APOLLO_TYRES_LTD. to RET_APOLLO_TYRES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_APOLLO_TYRES_LTD. to RET_APOLLO_TYRES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
2 2	AARTIIND	Response of VOLU_ARTI_INDUSTRIES to RET_ARTI_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_ARTI_INDUSTRIES to RET_ARTI_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_ARTI_INDUSTRIES to RET_ARTI_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors 	No effect
2 3	ASAHIINDIA	No Effect	No Effect	No Effect	No Effect
2 4	ASHOK	No effect	No effect	Response of VOLU_ASHOK_LEYLAND_LTD. to RET_ASHOK_LEYLAND_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
2 5	ASHOKA	No Effect	No Effect	No Effect	No effect
2 6	ASIANPAINT	No effect	No effect	No effect	No effect
2 7	ASTRAL	No effect	No effect	No effect	No effect
2 8	ASTRAZENCA	Response of VOLU_ASTRAZENCA_PHARMA to RET_ASTRA_ZENCA_PHARMA Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_ASTRAZENCA_PHARMA to RET_ASTRA_ZENCA_PHARMA Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect

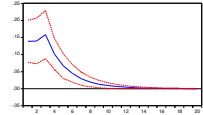
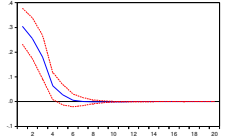
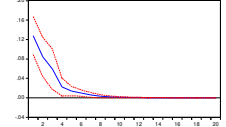
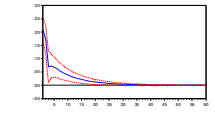
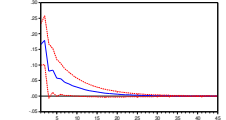
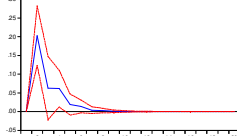
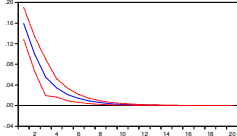
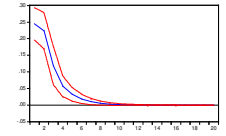
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
29	ATUL			No effect	No effect
30	AUROBINDO	No effect	No effect	No effect	No effect
31	AUTOAXLES	No effect	No Effect	No effect	
32	AXIS	No effect	No effect	No effect	No effect
33	JPINFRATEC	No effect	No Effect	No effect	No effect
34	BAJAJ-AUTO	No effect	No effect		No effect
35	BAJAJCON	No effect	No Effect	No effect	

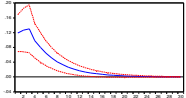
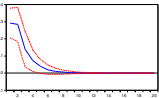
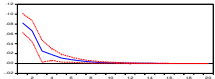
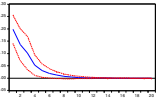
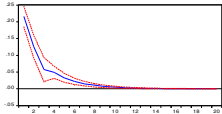
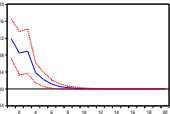
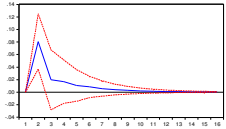
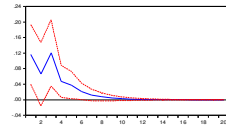
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
3 6	BAJAJELEC	No effect	Response of VOL_BAJAJ_ELECTRICALS to RE_BAJAJ_ELECTRICALS Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_BAJAJ_ELECTRICALS to RE_BAJAJ_ELECTRICALS Innovation using Cholesky (d.f. adjusted) Factors 
3 7	BAJFINANCE	No effect	No effect	No effect	No effect
3 8	BAJAJFINSV	No effect	Response of VOL_BAJAJ_HOLDINGS_INVESTMENT_LTD to RET_BAJAJ_HOLDINGS_INVESTMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_BAJAJ_HOLDINGS_INVESTMENT_LTD to RET_BAJAJ_HOLDINGS_INVESTMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
3 9	BAJAJHIND	Response of VOL_BAJAJ_HINDUSTAN_SUGAR_LTD to RE_BAJAJ_HINDUSTAN_SUGAR_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_BAJAJ_HINDUSTAN_SUGAR_LTD to RE_BAJAJ_HINDUSTAN_SUGAR_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
4 0	BAJAJHLDNG	Response of VOL_BAJAJ_HOLDINGS_INVESTMENT_LTD to RET_BAJAJ_HOLDINGS_INVESTMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	No effect
4 1	BALMERLAW RIE	No effect	No Effect	No effect	No effect
4 2	BALRAMCHIN	No effect	No Effect	Response of VOL_BANK_OF_BARODA to RET_BANK_OF_BARODA Innovation using Cholesky (d.f. adjusted) Factors 	No effect

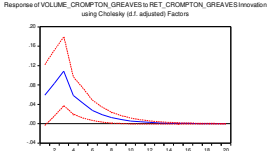
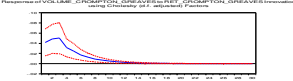
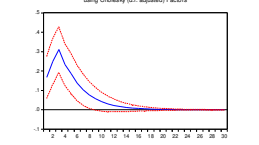
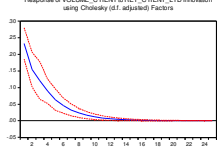
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
4 3	BANKBAROD A	No effect	No effect		
4 4	BANKINDIA	No Effect	No Effect		
4 5	BASF	No Effect	No Effect	No effect	
4 6	BATAINDIA	No effect	No Effect		No effect
4 7	BEML	No Effect	No Effect		
4 8	BERGEPAINT	No effect	No effect		

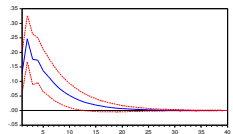
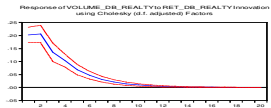
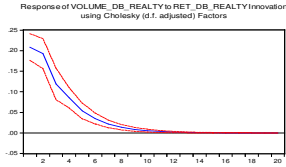
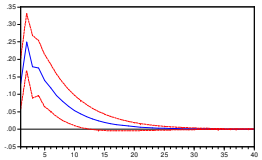
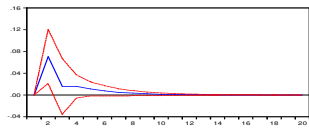
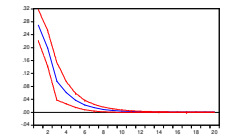
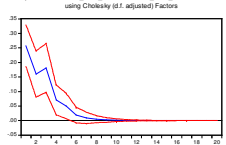
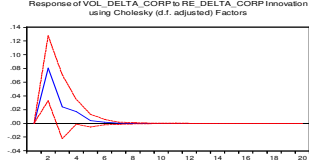
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
49	BFUTILITIE				No Effect
50	BGREENERGY		No Effect	No effect	
51	AIRTELPP	No effect	No effect	No effect	No effect
52	BEL	No effect	No effect	No effect	No effect
53	BHARATFORG	No effect	No effect	No effect	No effect
54	INDUSTOWER	No effect	No effect	No effect	No effect
55	BHEL	No effect	No effect	No effect	No effect
56	BIOCON	No effect	No effect		No effect
57	BIRLACORPN	No Effect	No Effect	No Effect	
58	BLUEDART	No Effect	No Effect	No effect	No Effect

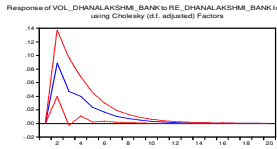
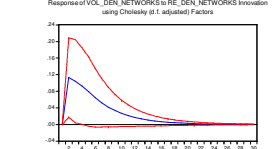
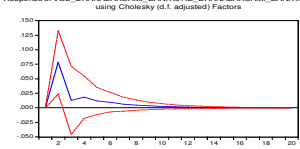
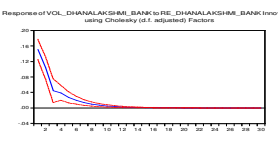
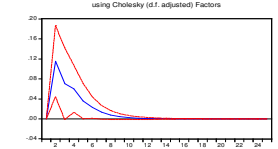
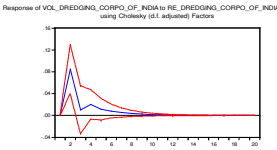
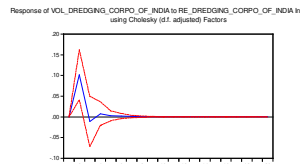
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
59	BLUESTARCO	No effect	No Effect		No effect
60	BPTC				
61	BOMBAYDYEING	No effect		No effect	
62	BOSCH	No effect	No effect	No effect	No effect
63	BPCL	No effect	No effect	No Effect	No effect
64	BRIGADE	No Effect	No Effect	No effect	No Effect
65	BRITANNIA	No effect	No effect	No effect	No effect
66	CANARA	No effect	No effect		No effect

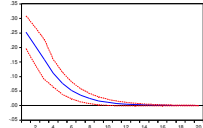
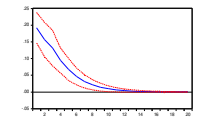
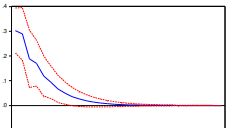
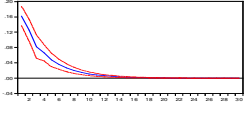
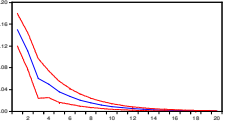
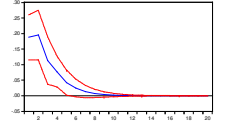
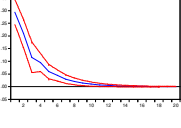
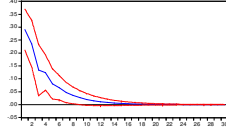
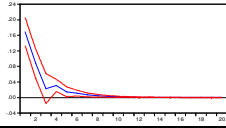
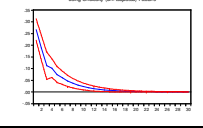
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
6 7	CANFINHOME	No Effect	No Effect		
6 8	CARBORUNIV	No Effect	No Effect	No effect	No Effect
6 9	CARERATING	No effect	No Effect		No effect
7 0	CASTROL	No Effect	No Effect		No Effect
7 1	CENTRALBK	No Effect	No Effect	No effect	
7 2	CENTENKA				No effect

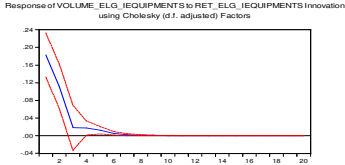
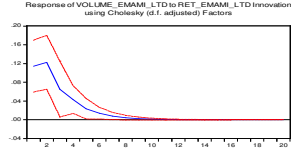
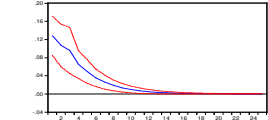
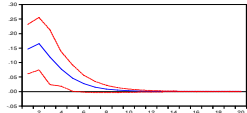
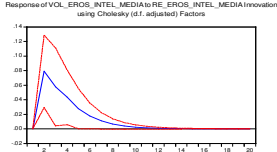
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
7 3	CENTURYPLY	No Effect	No Effect		
7 4	ABREL	No Effect		No Effect	
7 5	CESC	No Effect	No Effect	No Effect	No Effect
7 6	CHAMBLFERT	No Effect		No effect	No Effect
7 7	CHENNPETRO	No effect	No Effect	No effect	No effect
7 8	CHOLAFIN	No effect	No effect	No effect	No effect
7 9	CIPLA	No effect	No effect		No effect
8 0	CUB	No Effect	No Effect		
8	CIPL	No effect	No Effect	No effect	No effect

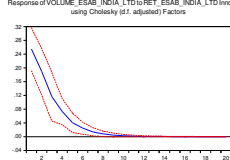
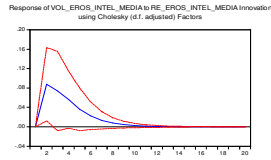
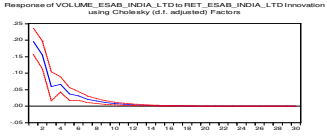
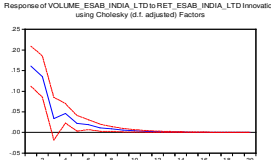
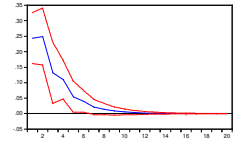
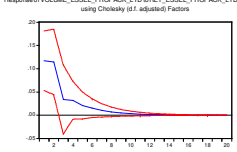
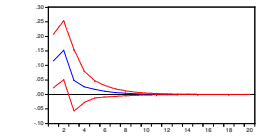
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
1					
8					
2	COALINDIA	No effect	No effect	No effect	No effect
8					
3	COLGATE	No effect	No effect	No effect	No effect
8					
4	CONCOR	No effect	No effect	No effect	No effect
8					
5	COROMANDE L	No effect	No effect	No effect	No effect
8					
6	CRISIL	No effect	No effect		No effect
8					
7	CROMPTON		No Effect	No effect	
8					
8	CUMMINS	No effect	No effect		No effect
8					
9	CYIENT	No Effect	No Effect	No effect	No Effect
9					
0	DABURE	No effect	No effect	No effect	No effect

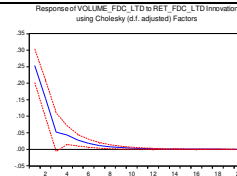
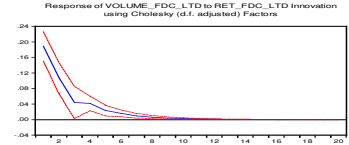
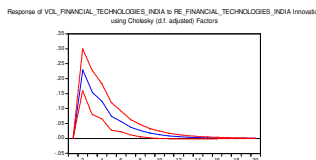
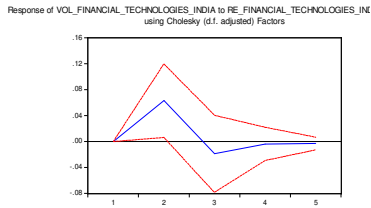
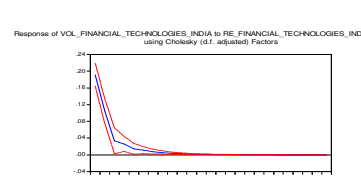
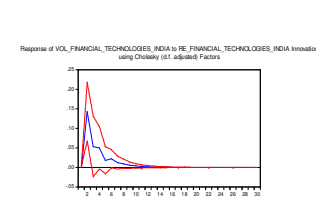
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
9 1	DBCORP	No effect	No Effect		No effect
9 2	DBREALTY			No effect	
9 3	DCBBANK		No Effect	No Effect	No effect
9 4	DCMSRHIRA M	No Effect	No Effect		
9 5	DEEPAKFERT	No Effect	No Effect	No effect	No Effect
9 6	DELTACORP		No Effect	No effect	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
97	DEN	No effect	No Effect		
98	DHANBANK			No effect	
99	DIVIS	No effect	No effect	No effect	No effect
100	DLF	No effect	No effect		No effect
101	DREDGECORP		No Effect	No effect	No effect
102	DRREDDY	No effect	No effect	No effect	No effect

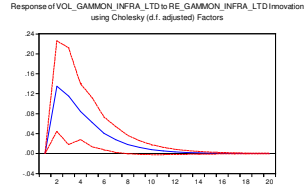
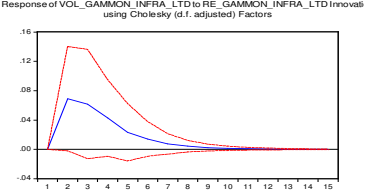
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
103	DYNAMATEC H	No effect	No Effect	Response of VOLUME_ECLERX_SERVICE_LTD to RET_ECLERX_SERVICE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
104	ECLERX	No Effect	No Effect	Response of VOLUME_ECLERX_SERVICE_LTD to RET_ECLERX_SERVICE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLUME_ECLERX_SERVICE_LTD to RET_ECLERX_SERVICE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
105	EDELWEISS	Response of VOLUME_EDELWEISS_FINANCIAL to RET_EDELWEISS_FINANCIAL Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLUME_EDELWEISS_FINANCIAL to RET_EDELWEISS_FINANCIAL Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOLUME_EDELWEISS_FINANCIAL to RET_EDELWEISS_FINANCIAL Innovation using Cholesky (d.f. adjusted) Factors 
106	EICHERMOT	No effect	No effect	Response of VOLUME_EID_PARRY to RET_EID_PARRY Innovation using Cholesky (d.f. adjusted) Factors 	No effect
107	EIDPARRY	No Effect	No Effect	No Effect	Response of VOLUME_EID_PARRY to RET_EID_PARRY Innovation using Cholesky (d.f. adjusted) Factors 
108	EIHLTD	No Effect	Response of VOLUME_EIH_LTD to RET_EIH_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLUME_ELECTROTEL_CASTING_LTD to RET_ELECTROTEL_CASTING_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect

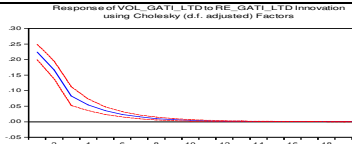
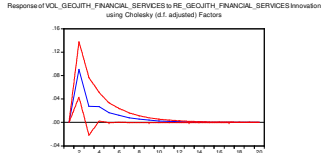
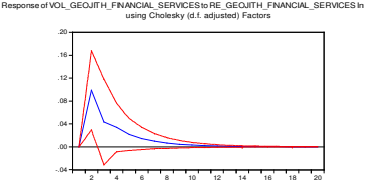
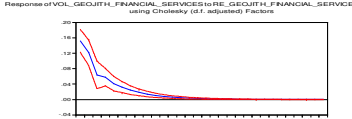
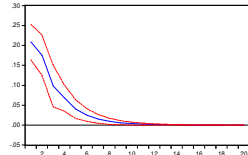
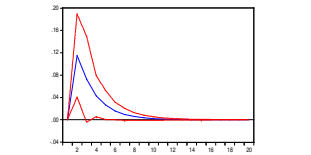
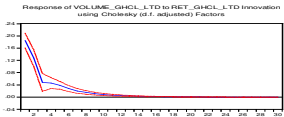
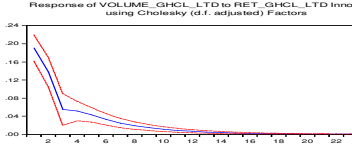
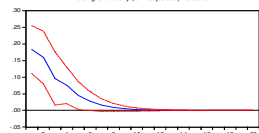
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
109	ELECTROSL	No Effect	No Effect	No Effect	No Effect
110	ELGIEQUIP	No Effect			No Effect
111	EMAMILTD	No Effect	No Effect		
112	ENGINEERSIN	No Effect	No Effect	No effect	No Effect
113	ENIL	No effect	No Effect		No effect

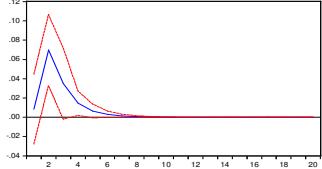
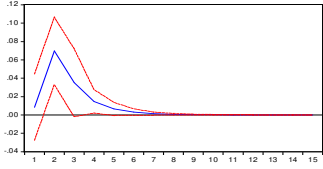
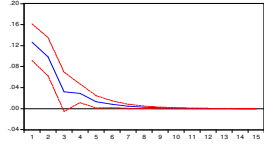
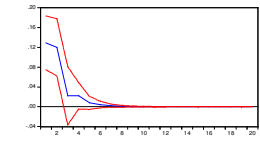
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
114	EROSMEDIA	No effect	No Effect		
115	ESABINDIA			No effect	
116	ESCORT	No effect	No effect		No effect
117	EPL	No Effect	No Effect	No effect	
118	EXIDE	No effect	No effect	No effect	No effect

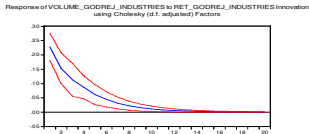
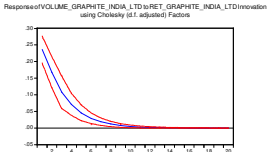
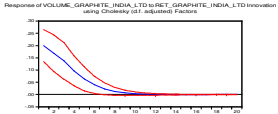
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
119	SCHAEFFLER	No effect	No effect		No effect
120	FDCLTD	No Effect		No effect	No Effect
121	FEDERALBNK	No effect	No effect	No effect	No effect
122	FEDERALMO GUL	No effect	No Effect		No effect
123	FMGOETZE			No Effect	

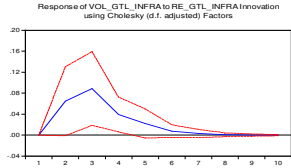
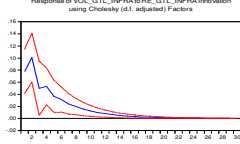
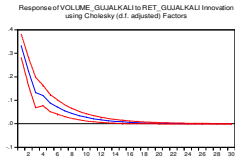
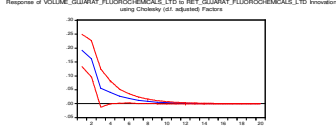
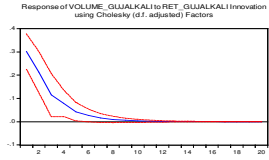
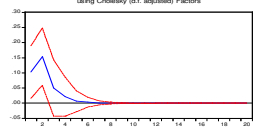
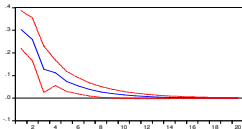
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
124	FINCABLES	No Effect	No Effect	No Effect	Response of VOLUME_FINDEX_CABLES_LTD to RET_FINDEX_CABLES_LTD Innovation using Cholesky (d.f. adjusted) Factors Response of VOLUME_FINDEX_INDUSTRIES to RET_FINDEX_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors
125	FINPIPE	No Effect	No Effect	No effect	Response of VOLU_FIRSTSOURCE_SOLUTIONS to RET_FIRSTSOURCE_SOLUTIONS Innovation using Cholesky (d.f. adjusted) Factors Response of VOL_FLEXITUFF_INTERNATIONAL_LTD to RET_FLEXITUFF_INTERNATIONAL_LTD Innovation using Cholesky (d.f. adjusted) Factors
126	FSL		No effect		No effect
127	FLEXITUFF	No effect		No effect	Response of VOL_FLEXITUFF_INTERNATIONAL_LTD to RET_FLEXITUFF_INTERNATIONAL_LTD Innovation using Cholesky (d.f. adjusted) Factors
128	FORTIS	No effect	No effect	No effect	No effect

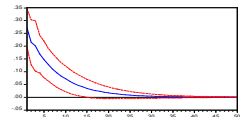
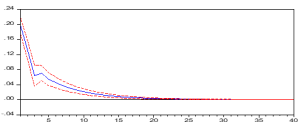
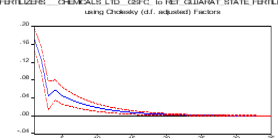
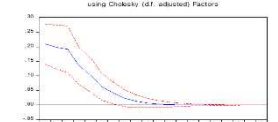
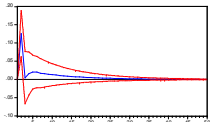
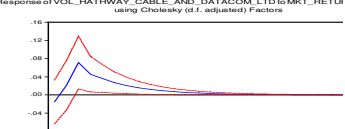
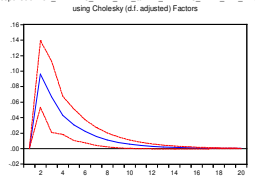
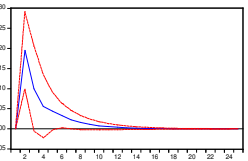
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
129	FCONSUMER	No effect	No Effect	No effect	No effect
130	FRETAIL	No effect	No Effect	No Effect	No effect
131	GABRIEL	No Effect	No Effect	No effect	No Effect
132	GAIL	No effect	No effect		No effect
133	GAMMONIND		No Effect	No effect	No effect

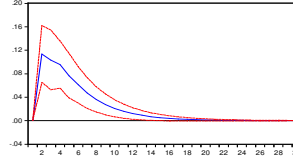
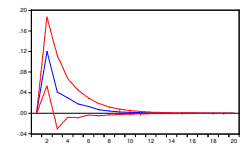
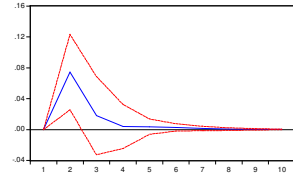
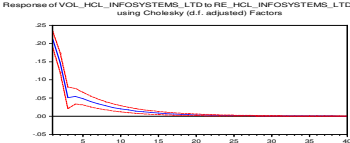
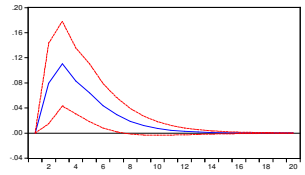
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
134	GATILTD	No effect		No effect	No effect
135	GDL	No effect			No effect
136	GEOJITHFSL				
137	GHCLLTD			No effect	

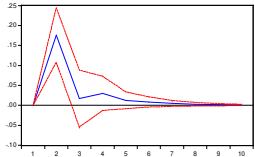
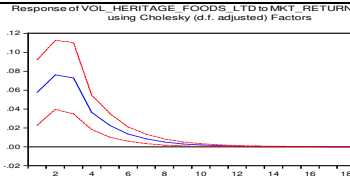
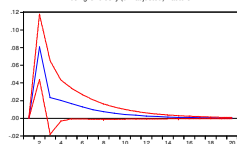
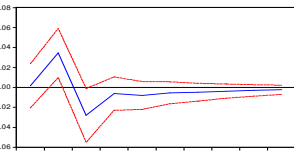
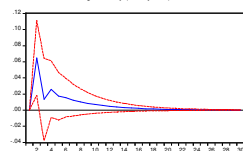
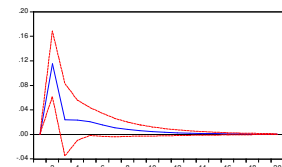
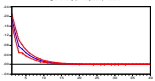
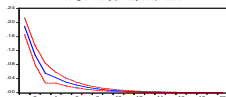
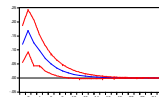
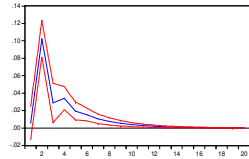
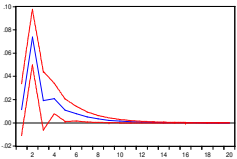
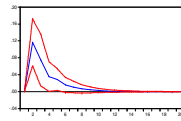
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
138	GILLETTE	Response of VOLU_GILLETTE_INDIA_LTD to RET_GILLETTE_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOLU_GILLETTE_INDIA_LTD to RET_GILLETTE_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
139	GSKCONS	No effect	No effect	No effect	No effect
140	GLENMARK	No effect	No effect	Response of VOLU_GMR_INFRASTRUCTURE to RET_GMR_INFRASTRUCTURE Innovation using Cholesky (d.f. adjusted) Factors 	No effect
141	GMRINFRA	No effect	No effect	No effect	Response of VOLU_GMR_INFRASTRUCTURE to RET_GMR_INFRASTRUCTURE Innovation using Cholesky (d.f. adjusted) Factors 
142	GODFRYPHLP	No effect	No effect	No effect	No effect

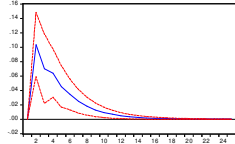
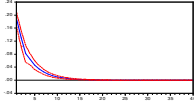
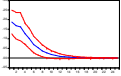
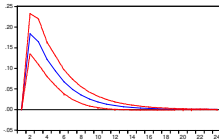
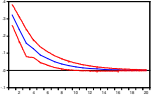
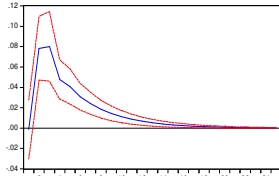
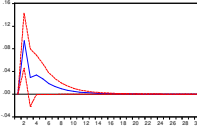
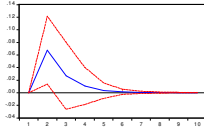
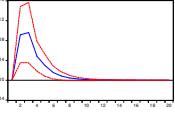
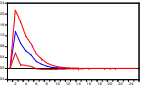
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
143	GODREJCON	No effect	No Effect		No effect
144	GODREJIND	No Effect	No effect	No effect	No Effect
145	GODREJPROP	No effect	No effect		No effect
146	GRAPHITE	No Effect	No Effect	No effect	
147	GRASSIM	No effect	No effect	No Effect	No effect
148	GESHIPPING	No Effect	No Effect	No effect	No Effect

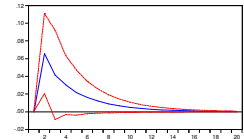
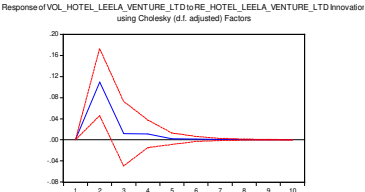
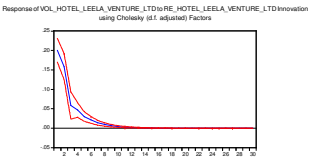
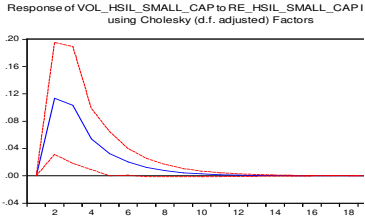
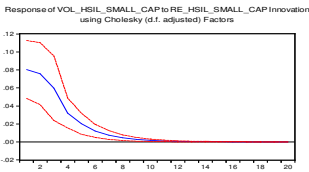
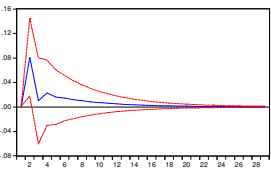
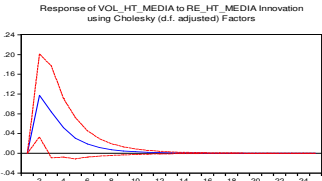
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
149	GREAVESCOT	No effect	No Effect	No effect	No effect
150	GTLINFRA				No effect
151	GUJALKALI	No Effect	No Effect		
152	FLUOROCHEM	No Effect	No Effect	No Effect	
153	GIPCL	No Effect	No Effect	No Effect	

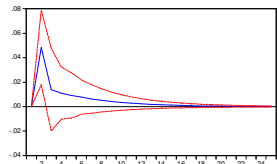
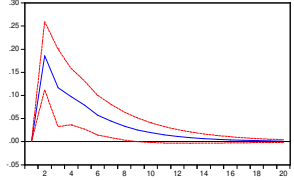
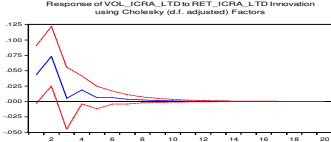
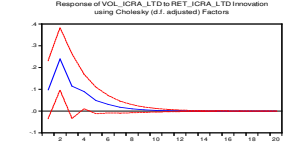
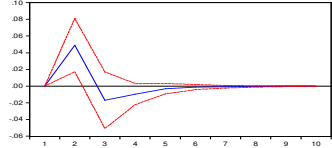
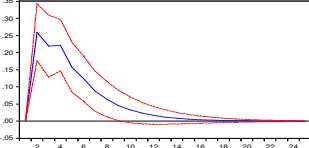
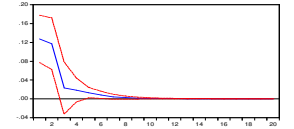
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
154	GMDCLTD	No Effect	No Effect	No Effect	
155	GPPL	No Effect	No Effect	No Effect	No Effect
156	GSFC			No Effect	
157	GULFOILLUB	No Effect	No Effect		No Effect
158	HATHWAY	No effect			

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
159	HAVELLS	No effect	No effect		
160	HCL-INSYS			No effect	
161	HCLTECH	No effect	No effect	No effect	No effect
162	HDFCBANK	No effect	No effect	No Effect	No effect
163	HEG	No Effect	No Effect	No effect	No Effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
164	HERITGFOOD	Response of VOL_HERITAGE_FOODS_LTD to RE_HERITAGE_FOODS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HERITAGE_FOODS_LTD to MKT_RETURN using Cholesky (d.f. adjusted) Factors 	Response of VOL_HERO_MOTOCORP_LTD to RET_HERO_MOTOCORP_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
165	HEROMOTO	Response of VOL_HERO_MOTOCORP_LTD to RET_HERO_MOTOCORP_LTD_Inno using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD to RET_HIMACHAL_FUTURISTIC_COMMUN using Cholesky (d.f. adjusted) Factors 	Response of VOL_HERO_MOTOCORP_LTD to RET_HERO_MOTOCORP_LTD Innovation using Cholesky (d.f. adjusted) Factors 
166	HIMACHLFUT	Response of VOL_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD to RET_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD to RET_HIMACHAL_FUTURISTIC_COM using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD to RET_HIMACHAL_FUTURISTIC_COMMUNICATIONS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
167	HIMATSEIDE	No effect	No Effect	No effect	No effect
168	HINDALCO	Response of VOL_HINDALCO_INDUSTRIES_LTD to RET_HINDALCO_INDUSTRIES_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDALCO_INDUSTRIES_LTD to RET_HINDALCO_INDUSTRIES_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HINDALCO_INDUSTRIES_LTD to RET_HINDALCO_INDUSTRIES_LTD_Innovation using Cholesky (d.f. adjusted) Factors 

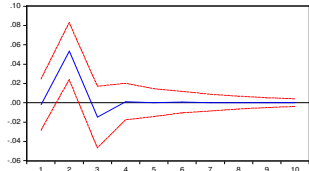
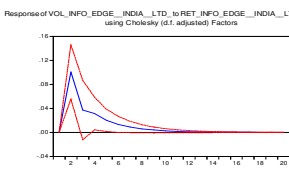
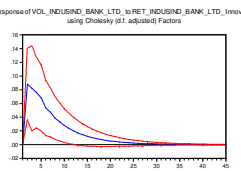
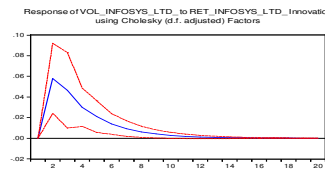
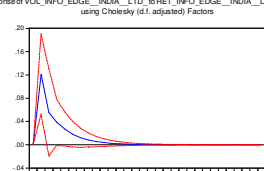
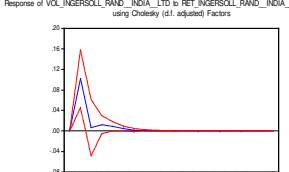
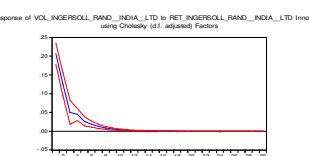
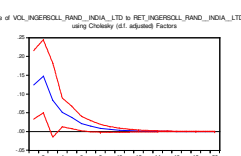
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
169	HINDPETRO	No effect	No effect	Response of VOL_HINDUSTAN_CONSTRUCTION_COMPANY_LTD_HOEC to RET_HINDUSTAN_CONSTRUCTION_C using Cholesky (d.f. adjusted) Factors 	No effect
170	HCC	Response of VOL_HINDUSTAN_CONSTRUCTION_COMPANY_LTD_HOEC to RET_HINDUSTAN_CONSTRUCTION_COMPANY_LTD_3 using Cholesky (d.f. adjusted) Factors 	No Effect	No Effect	Response of VOL_HINDUSTAN_CONSTRUCTION_COMPANY_LTD_HOEC to RET_HINDUSTAN_CONSTRUCTION_COMPANY_LTD_HOEC_Innovation using Cholesky (d.f. adjusted) Factors 
171	HINDCOPPER	No Effect	No Effect	Response of VOL_HINDUSTAN_ZINC_LTD to RET_HINDUSTAN_ZINC_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_COPPER_LTD_HOEC to RET_HINDUSTAN_COPPER_LTD_HOEC_Innovation using Cholesky (d.f. adjusted) Factors 
172	HINDZINC	Response of VOL_HINDUSTAN_ZINC_LTD to RET_HINDUSTAN_ZINC_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to RET_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD using Cholesky (d.f. adjusted) Factors 	No effect
173	HOEC	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to RET_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HONEYWELL_AUTOMATION_INDIA_LTD_HONAUT to RET_HONEYWELL_AUTOMATION_INDIA_LTD_HONAUT_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to RET_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC_Innovation using Cholesky (d.f. adjusted) Factors 

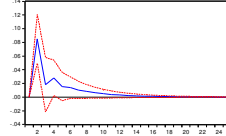
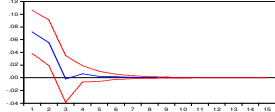
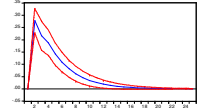
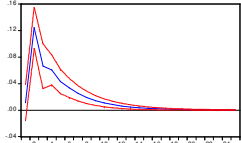
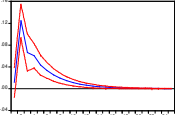
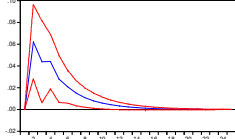
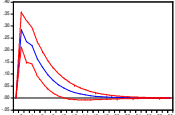
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
174	HONAUT	No effect	No effect		No effect
175	THELEELA			No effect	No effect
176	HSIL				No effect
177	HTMEDIA	No effect	No Effect	No effect	

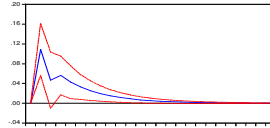
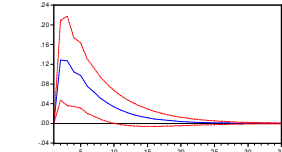
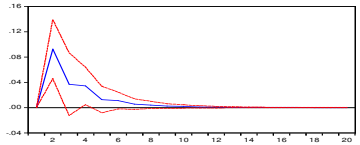
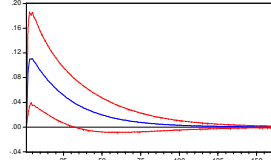
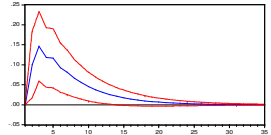
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
178	HUL	No effect	No effect	Response of VOL_ICICI_BANK_LTD to RET_ICICI_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_ZINC_LTD to RET_HINDUSTAN_ZINC_LTD Innovation using Cholesky (d.f. adjusted) Factors 
179	ICICI	No effect	No effect	No Effect	No effect
180	ICRA	Response of VOL_ICRA_LTD to RET_ICRA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_ICRA_LTD to RET_ICRA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
181	IDBI	No effect	No effect	Response of VOL_IDEA_CELLULAR_VI to RET_IDEA_CELLULAR_VI Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_IDBI_BANK to RET_IDBI_BANK Innovation using Cholesky (d.f. adjusted) Factors 
182	IDEA	No Effect	No Effect	No effect	Response of VOL_IDEA_CELLULAR_VI to RET_IDEA_CELLULAR_VI Innovation using Cholesky (d.f. adjusted) Factors 

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
183	IDFC	No effect	No effect	No Effect	Response of VOL_IDFC_LTD to RET_IDFC_LTD Innovation using Cholesky (d.f. adjusted) Factors
184	IFBIND	Response of VOL_IFB_INDUSTRIES_LTD to RET_IFB_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	No Effect	Response of VOL_IFB_INDUSTRIES_LTD to RET_IFB_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors
185	IFCI	No Effect	Response of VOL_IFB_INDUSTRIES_LTD to RET_IFB_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_IFCI_LTD to RET_IFCI_LTD Innovation using Cholesky (d.f. adjusted) Factors
186	IIFL		No Effect	No effect	No Effect
187	INDIABULLS	No effect	No Effect	Response of VOL_INDIA_CEMENTS_LTD to RET_INDIA_CEMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_INDIABULLS_VENTURES_LTD to RET_INDIABULLS_VENTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors

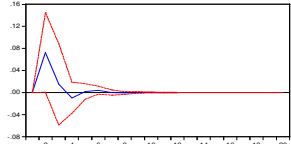
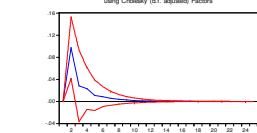
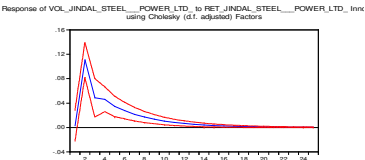
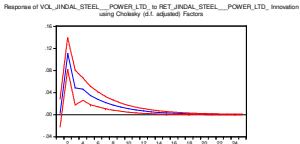
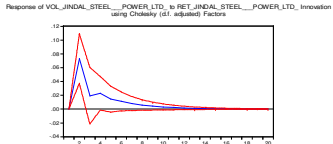
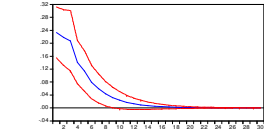
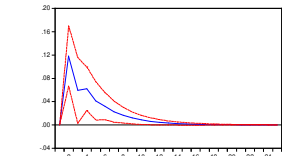
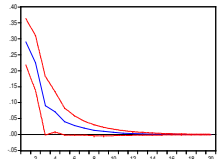
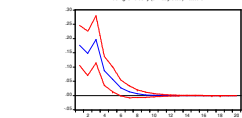
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
188	INDIACEM	No Effect	Response of VOL_INDIABILLS_VENTURES_LTD to RE_INDIABILLS_VENTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_IDFC_LTD_ to RET_IDFC_LTD_ Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_INDIA_CEMENTS_LTD to RET_INDIA_CEMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors
189	INDIANB	No effect	No Effect	Response of VOL_INDIAN_HOTELS_CO_LTD_ to RET_INDIAN_HOTELS_CO_LTD_ Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_INDIAN_BANK_LTD to RET_INDIAN_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors
190	IHCL	No effect	No effect	No Effect	Response of VOL_INDIAN_HOTELS_CO_LTD_ to RET_INDIAN_HOTELS_CO_LTD_ Innovation using Cholesky (d.f. adjusted) Factors
191	IOB	No Effect	Response of VOL_INDIAN_HOTELS_CO_LTD_ to RET_INDIAN_HOTELS_CO_LTD_ Innovation using Cholesky (d.f. adjusted) Factors	No Effect	Response of VOL_INDIAN_OVERSEAS_BANK_LTD to RET_INDIAN_OVERSEAS_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors
192	IGL	No Effect	No Effect	No effect	No Effect

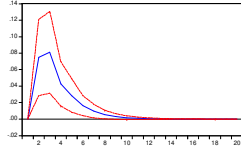
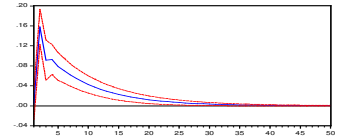
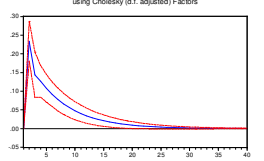
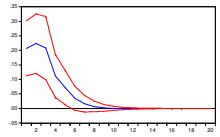
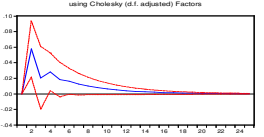
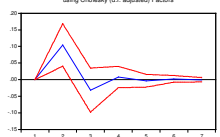
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
193	INDUSINDBK	Response of VOL_INDUSIND_BANK_LTD_ to RET_INDUSIND_BANK_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_INFO_EDGE__INDIA__LTD_ to RET_INFO_EDGE__INDIA__LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_INDUSIND_BANK_LTD_ to RET_INDUSIND_BANK_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
194	NAUKRI	No effect	No effect	Response of VOL_INFOSYS_LTD_ to RET_INFOSYS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_INFO_EDGE__INDIA__LTD_ to RET_INFO_EDGE__INDIA__LTD_Innovation using Cholesky (d.f. adjusted) Factors 
195	INFY	No effect	No effect	Response of VOL_INGERSOLL_RAND_INDIA_LTD to RET_INGERSOLL_RAND_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
196	INGERRAND	Response of VOL_INGERSOLL_RAND_INDIA_LTD to RET_INGERSOLL_RAND_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No Effect	Response of VOL_INGERSOLL_RAND_INDIA_LTD to RET_INGERSOLL_RAND_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 

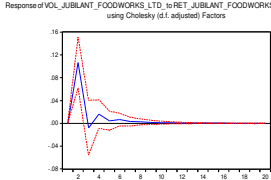
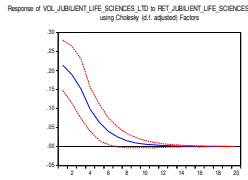
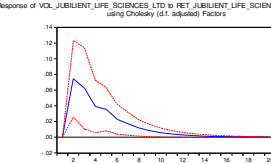
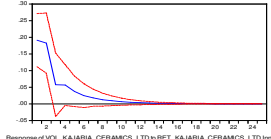
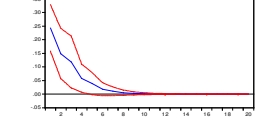
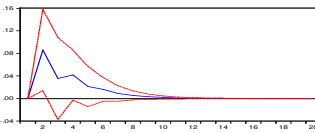
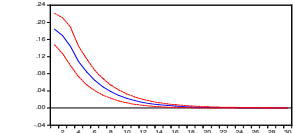
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
197	INOXLEISUR	No Effect	No Effect	Response of VOL_INDIAN_OIL_CORPORATION_LTD. to RET_INDIAN_OIL_CORPORATION_LTD_Innovation using Cholesky (s.f. adjusted) Factors 	No Effect
198	IOC	No effect	No effect	No Effect	No effect
199	IPCALAB	No Effect	Response of VOL_IPCA_LABORATORIES_LTD to RET_IPCA_LABORATORIES_LTD Innovation using Cholesky (s.f. adjusted) Factors 	Response of VOL_IPB_INFRASTRUCTURE_DEVELOPERS_LTD. to RET_IPB_INFRASTRUCTURE_DEVELOPERS_LTD_Innovation using Cholesky (s.f. adjusted) Factors 	No Effect
200	IRB	Response of VOL_IPB_INFRASTRUCTURE_DEVELOPERS_LTD. to RET_IPB_INFRASTRUCTURE_DEVELOPERS_LTD_Innovation using Cholesky (s.f. adjusted) Factors 	Response of VOL_IPB_INFRASTRUCTURE_DEVELOPERS_LTD. to RET_IPB_INFRASTRUCTURE_DEVELOPERS_LTD_Innovation using Cholesky (s.f. adjusted) Factors 	Response of VOL_ITC_LTD. to RET_ITC_LTD_Innovation using Cholesky (s.f. adjusted) Factors 	Response of VOL_IPB_INFRASTRUCTURE_DEVELOPERS_LTD. to RET_IPB_INFRASTRUCTURE_DEVELOPERS_LTD_Innovation using Cholesky (s.f. adjusted) Factors 
201	ITC	No effect	No effect	No Effect	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
202	ITD	No Effect	No Effect		No Effect
203	JAGRAN	No effect	No Effect	No effect	
204	JAICORPLTD		No Effect		No effect
205	JISLDVREQS	No effect	No Effect	No effect	

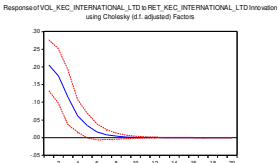
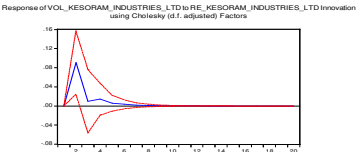
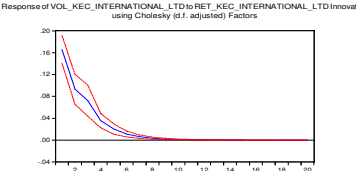
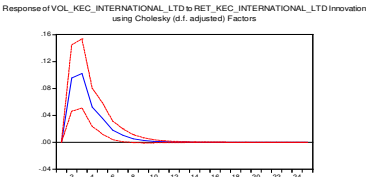
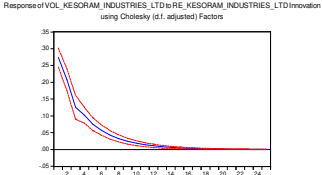
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
206	JPOWER	No effect		No effect	Response of VOL_JAMRU_KASHMIR_BANK to RE_JAMRU_KASHMIR_BANK Innovation using Cholesky (d.f. adjusted) Factors
207	J&KBANK	No effect	No Effect	No effect	No Effect
208	JBCHEPHARM	Response of VOL_JBCHEMICALS_PHARMACEUTICALS_LTD to RET_JBCHEMICALS_PHARMACEUTICALS_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_JBCHEMICALS_PHARMACEUTICALS_LTD to RET_JBCHEMICALS_PHARMACEUTICALS_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_JBCHEMICALS_PHARMACEUTICALS_LTD to RET_JBCHEMICALS_PHARMACEUTICALS_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_JBF_INDUSTRIES to RE_JBF_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors
209	JBFIND	Response of VOL_JYOTI_STRUCTURES_LTD to RET_JYOTI_STRUCTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	Response of VOL_JBF_INDUSTRIES to RE_JBF_INDUSTRIES Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_JINDAL_SAW_LTD to RET_JINDAL_SAW_LTD Innovation using Cholesky (d.f. adjusted) Factors
210	JINDALSAW	Response of VOL_JINDAL_SAW_LTD to RET_JINDAL_SAW_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_JINDAL_SAW_LTD to RET_JINDAL_SAW_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	Response of VOL_JINDAL_STANLESS_LTD to RET_JINDAL_STANLESS_LTD Innovation using Cholesky (d.f. adjusted) Factors

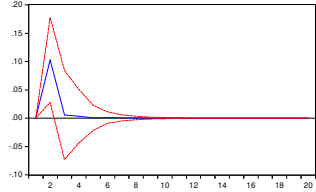
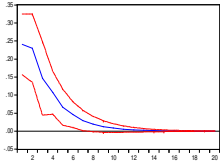
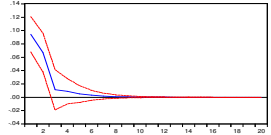
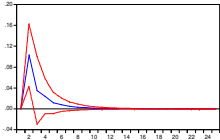
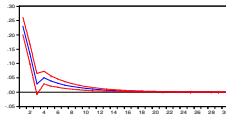
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
211	JSL	No Effect	No Effect	Response of VOL_JINDAL_STEEL__POWER_LTD to RET_JINDAL_STEEL__POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JINDAL_STEEL__POWER_LTD to RET_JINDAL_STEEL__POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 
212	JINDALSTEL	Response of VOL_JINDAL_STEEL__POWER_LTD to RET_JINDAL_STEEL__POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JINDAL_STEEL__POWER_LTD to RET_JINDAL_STEEL__POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JINDAL_STEEL__POWER_LTD to RET_JINDAL_STEEL__POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
213	JKCEMENT	No Effect	No Effect	No Effect	Response of VOL_JK_LAKSHMI_CEMENT_LTD to RET_JK_LAKSHMI_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 
214	JKLAKSHMI	No Effect	No Effect	Response of VOL_JK_LAKSHMI_CEMENT_LTD to RET_JK_LAKSHMI_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JK_TYRE__INDUSTRIES_LTD to RET_JK_TYRE__INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 
215	JKTYRE	No Effect	No Effect	No Effect	Response of VOL_J_KUMAR_INFRAPROJECTS_LTD to RET_J_KUMAR_INFRAPROJECTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
216	JKIL	No Effect	No Effect	Response of VOL_J_KUMM_INFRAPROJECTS_LTD__JKIL_ to RET_J_KUMM_INFRAPROJECTS_LTD__JKIL_ Inv using Cholesky (d.f. adjusted) Factors 	No Effect
217	JMFINANCIL	No Effect	No Effect	No Effect	No effect
218	JSWENERGY	Response of VOL_JSW_ENERGY_LTD_ to RET_JSW_ENERGY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_JSW_ENERGY_LTD_ to RET_JSW_ENERGY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JSW_HOLDINGS_LTD to RET_JSW_HOLDINGS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
219	JSWHL	No Effect	No Effect	No Effect	No effect
220	JSWSTEEL	No effect	No effect	Response of VOL_JSW_STEEL_LTD_ to RET_JSW_STEEL_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JUBLANT_FOODWORKS_LTD_ to RET_JUBLANT_FOODWORKS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 

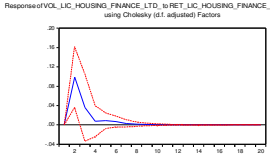
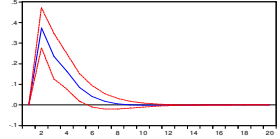
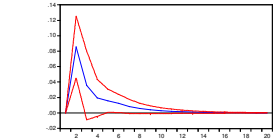
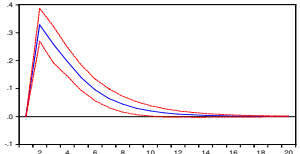
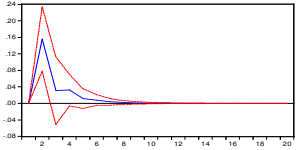
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
221	JUBLFOOD	No effect	No effect		
222	JUBILANTPHARMA	No Effect	No Effect		No Effect
223	JUSTDIAL	No Effect	No Effect	No Effect	
224	JYOTHYLAB	No Effect	No Effect	No effect	
225	JYOTISTRUC			No effect	No Effect

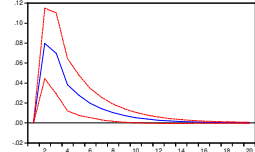
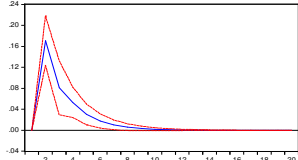
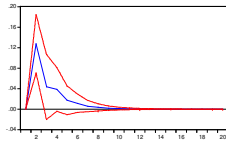
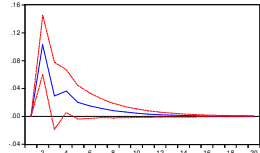
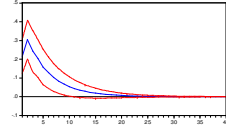
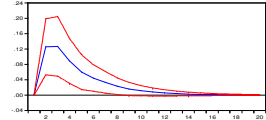
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
226	KAJARIACER	No Effect	No Effect	No Effect	Response of VOL_KANSAL_NEROLAC_PAINTS_LTD to RET_KANSAL_NEROLAC_PAINTS_LTD Innovation using Cholesky (d.f. adjusted) Factors
227	KPIL	No Effect	Response of VOL_KALPATARU_PROJECTS_INTL to RET_KALPATARU_PROJECTS_INTL Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_KARNATAKA_BANK_LTD to RET_KARNATAKA_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors
228	KANSAINER	No Effect	No Effect	No effect	Response of VOL_KARUR_VYSYA_BANK_LTD to RET_KARUR_VYSYA_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors
229	KTKBANK	Response of VOL_KARNATAKA_BANK_LTD to RET_KARNATAKA_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_KARNATAKA_BANK_LTD to RET_KARNATAKA_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	No Effect
230	KARURVYSYA A	No Effect	No Effect	No effect	No effect

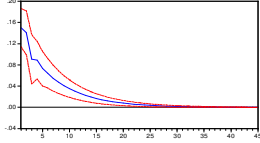
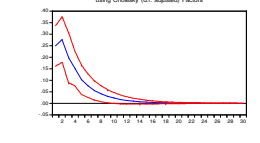
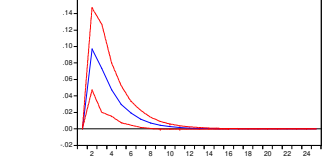
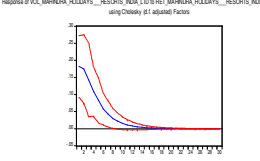
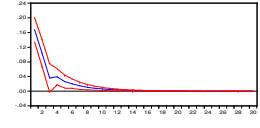
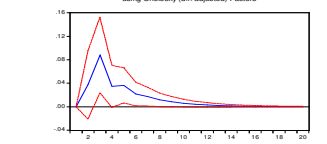
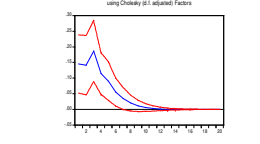
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
231	KSCL	No Effect	No Effect	No effect	
232	KCP		No Effect	No effect	No effect
233	KEC		No Effect		No effect
234	KILPP	No effect		No effect	No effect

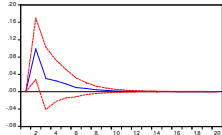
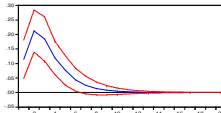
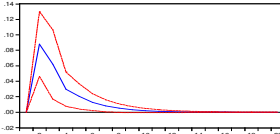
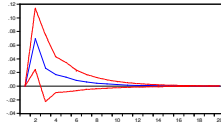
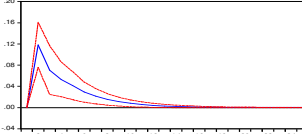
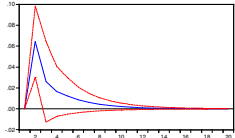
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
235	KKCL	Response of VOL_KITEX_GARMENTS_LTD to RE_KITEX_GARMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_KNR_CONSTRUCTIONS_LTD to RET_KNR_CONSTRUCTIONS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
236	KITEX	No effect	Response of VOL_KITEX_GARMENTS_LTD to RE_KITEX_GARMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
237	KNRCON	No Effect	No Effect	No effect	Response of VOL_KOTAK_MAHINDRA_BANK_LTD to RET_KOTAK_MAHINDRA_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors 
238	KOLTEPATIL	No effect	Response of VOL_KOLTEPATIL_DEVELOPERS_LTD to RE_KOLTEPATIL_DEVELOPERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect

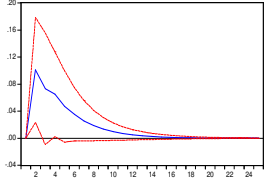
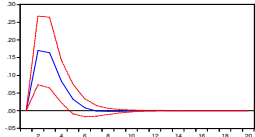
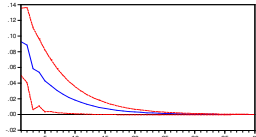
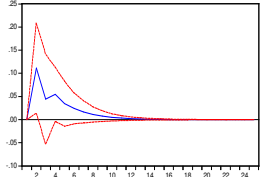
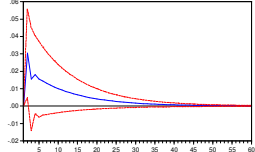
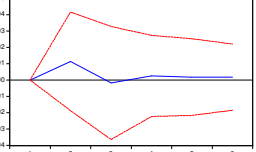
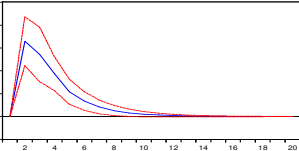
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
239	KOTAKBANK	Response of VOL_KOTAK_MAHINDRA_BANK_LTD. to RET_KOTAK_MAHINDRA_BANK_LTD. In using Cholesky (d.f. adjusted) Factors 	Response of VOL_KOTAK_MAHINDRA_BANK_LTD. to RET_KOTAK_MAHINDRA_BANK_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_KOTAK_MAHINDRA_BANK_LTD. to RET_KOTAK_MAHINDRA_BANK_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
240	KPITTECH	No effect	No effect	Response of VOL_KPIT_TECHNOLOGIES_LTD. to RET_KPIT_TECHNOLOGIES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
241	KPRMILL	No Effect	No Effect	No Effect	Response of VOL_LARSEN_TOUBRO_LTD. to RET_LARSEN_TOUBRO_LTD. Innovation using Cholesky (d.f. adjusted) Factors
242	KSB	No Effect	No Effect	No effect	No Effect
243	L&T	No effect	No effect	Response of VOL_LARSEN_TOUBRO_LTD. to RET_LARSEN_TOUBRO_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No effect

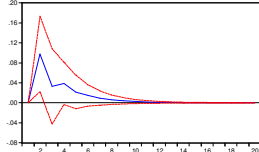
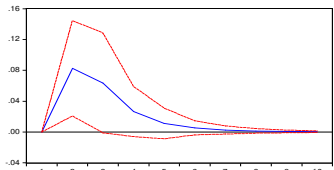
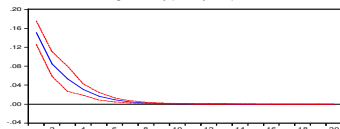
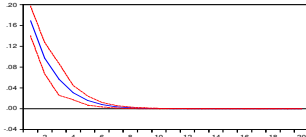
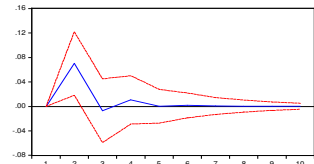
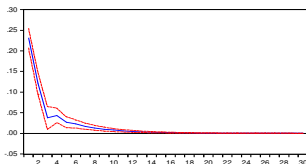
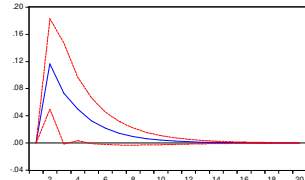
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
244	LMW	No Effect	No Effect	No effect	No effect
245	LAOPALA	No effect	No Effect	No effect	
246	LGBBROSLTD	No effect	No Effect	No effect	
247	LICHSGFIN	No effect	No effect		No effect
248	LINDEINDIA	No effect	No effect		

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
249	LTF	No effect	No effect	Response of VOL_L_T_FINANCE_LTD to RET_L_T_FINANCE_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
250	LTIM	No effect	No effect	Response of VOL_LTIMINDTREE to RET_LTIMINDTREE_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MAHINDRA__MAHINDRA_LTD to RET_MAHINDRA__MAHINDRA_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
251	LUPIN	No effect	No effect	Response of VOL_LUPIN_LTD to RET_LUPIN_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
252	M&M	No effect	No effect	No effect	Response of VOL_MAGMA_FINCORP_LTD to RET_MAGMA_FINCORP_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
253	M&MFIN	No effect	No effect	No effect	Response of VOL_MAHARASHTRA_SCOOTERS_LTD to RET_MAHARASHTRA_SCOOTERS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
254	POONAWALL A	Response of VOL_MAGMA_FINCORP_LTD to RET_MAGMA_FINCORP_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to RET_MAHARASHTRA_SEAMLESS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
255	MAHSCOOTE R	No effect	No Effect	Response of VOL_MAHARASHTRA_SCOOTERS_LTD to RET_MAHARASHTRA_SCOOTERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to RET_MAHARASHTRA_SEAMLESS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
256	MAHSEAMLE S	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to RET_MAHARASHTRA_SEAMLESS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to RET_MAHARASHTRA_SEAMLESS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
257	MHRIL	No Effect	No Effect	No effect	No effect
258	MAHLIFE	No Effect	No Effect	No effect	No effect

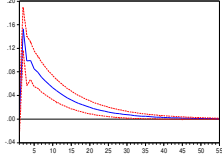
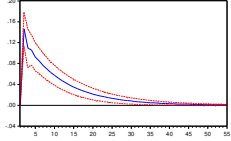
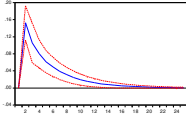
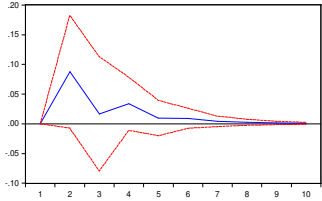
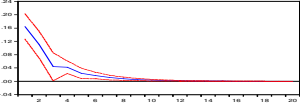
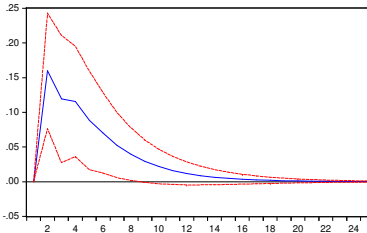
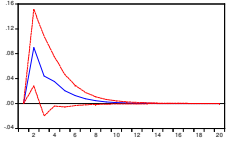
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
259	MANGCHEFER	No effect	No Effect	No effect	No effect
260	MRPL	Response of VOL_MANGALORE_REFINERY_AND_PETROCHEMICALS_LTD to RE_MANGALORE_REFINERY_AND_PE using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_MARKSANS_PHARMA_LTD to RET_MARKSANS_PHARMA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
261	MARICO	No effect	No effect	Response of VOL_MARICO_LTD to RET_MARICO_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MARUTI_SUZUKI_INDIA_LTD to RET_MARUTI_SUZUKI_INDIA_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
262	MARKSANS		No Effect	Response of VOL_MARKSANS_PHARMA_LTD to RET_MARKSANS_PHARMA_LTD Inno using Cholesky (d.f. adjusted) Factors 	No effect
263	MARUTI	No effect	No effect	Response of VOL_MARUTI_SUZUKI_INDIA_LTD to RET_MARUTI_SUZUKI_INDIA_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect

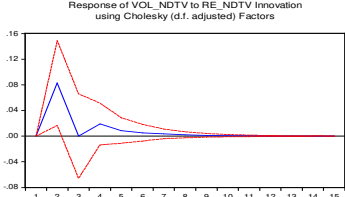
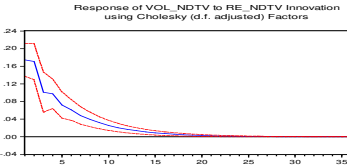
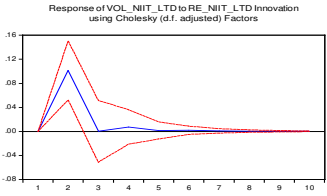
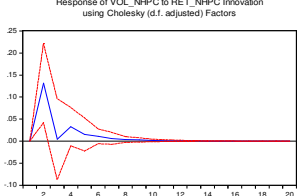
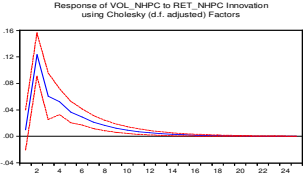
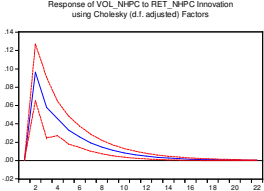
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
264	MAXINDIA	No effect	No Effect	No effect	Response of VOL_MBL_INFRASTRUCTURE_LTD to RE_MBL_INFRASTRUCTURE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
265	MAYURUNIQ	No effect	No Effect	No effect	No effect
266	MBLINFRA	Response of VOL_MBL_INFRASTRUCTURE_LTD to RE_MBL_INFRASTRUCTURE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MBL_INFRASTRUCTURE_LTD to RE_MBL_INFRASTRUCTURE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MCLEOD_RUSSEL_INDIA_LTD to RE_MCLEOD_RUSSEL_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
267	MCDHOLDIN G	Response of VOL_UNITED_SPIRITS_LTD to RET_UNITED_SPIRITS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_UNITED_SPIRITS_LTD to RET_UNITED_SPIRITS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_UNITED_SPIRITS_LTD to RET_UNITED_SPIRITS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
268	MCLEODRESS	No effect	No Effect	Response of VOL_MCLEOD_RUSSEL_NDA LTD to RE_MCLEOD_RUSSEL_NDA LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
269	MERCATOR	Response of VOL_MERCATOR_LTD to RE_MERCATOR_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	No effect
270	PGHL	Response of VOL_MERCK_LTD to RET_MERCK_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MERCK_LTD to RET_MERCK_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
271	MMTC	Response of VOL_MMTC_LTD to RE_MMTC_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MMTC_LTD to RE_MMTC_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MOTHERSON_SUMI_LTD to RET_MOTHERSON_SUMI_LTD Innovation using Cholesky (d.f. adjusted) Factors 

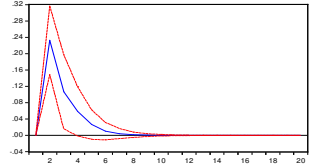
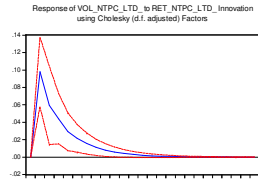
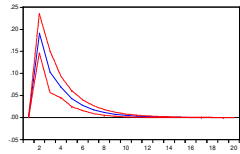
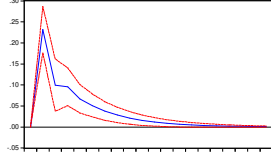
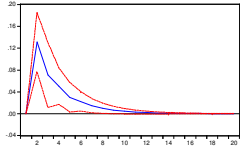
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
272	MOIL	Response of VOL_MOIL_LTD to RE_MOIL_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	Response of VOL_MT_EDUCARE_LTD to RE_MT_EDUCARE_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD to RET_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD_Innovation using Cholesky (d.f. adjusted) Factors
273	MOTHERSON	No effect	Response of VOL_MOTHERSON_SUM_LTD to RET_MOTHERSON_SUM_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect
274	MOTILALOFIS	Response of VOL_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD to RET_MOTILAL_OFIS_FINANCIAL_SERVICES using Cholesky (d.f. adjusted) Factors	Response of VOL_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD to RET_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD_Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD to RET_MOTILAL_OFIS_FINANCIAL_SERVICES_LTD_Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MRF_LTD to RET_MRF_LTD_Innovation using Cholesky (d.f. adjusted) Factors
275	MPHASIS	Response of VOL_MPHASIS_LTD to RET_MPHASIS_LTD_Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MPHASIS_LTD to RET_MPHASIS_LTD_Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect
276	MRF	No effect	Response of VOL_MRF_LTD to RET_MRF_LTD_Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MRF_LTD to RET_MRF_LTD_Innovation using Cholesky (d.f. adjusted) Factors	No effect

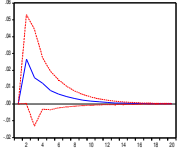
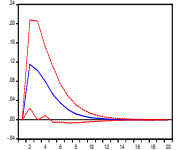
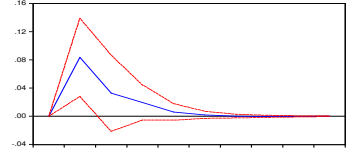
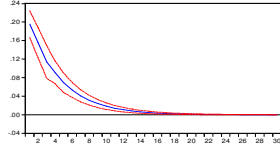
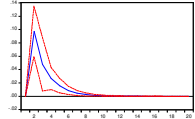
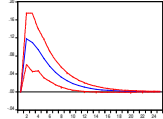
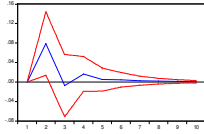
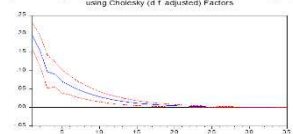
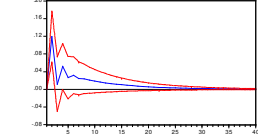
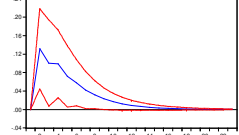
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
277	MTEDUCARE	Response of VOL_MT_EDUCARE_LTD to RE_MT_EDUCARE_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	No effect	Response of VOL_MUTHOOT_FINANCE_LTD to RET_MUTHOOT_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors
278	MUNJALSHOW	Response of VOL_MUNJAL_SHOWA_LTD to RE_MUNJAL_SHOWA_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	No effect	No effect
279	MUTHOOTFIN	Response of VOL_MUTHOOT_FINANCE_LTD to RET_MUTHOOT_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MUTHOOT_FINANCE_LTD to RET_MUTHOOT_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_MUTHOOT_FINANCE_LTD to RET_MUTHOOT_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_NATIONAL_ALUMINIUM_CO_LTD to RET_NATIONAL_ALUMINIUM_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors
280	NBCC	No effect	No Effect	No effect	No Effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
281	NATIONALUM	Response of VOL_NATIONAL_ALUMINUM_CO_LTD to RET_NATIONAL_ALUMINUM_CO_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_NATIONAL_ALUMINUM_CO_LTD to RET_NATIONAL_ALUMINUM_CO_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_NATIONAL_ALUMINUM_CO_LTD to RET_NATIONAL_ALUMINUM_CO_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
282	NAVA	No Effect	No Effect	No effect	No Effect
283	NAVNETEDUL	Response of VOL_NAVNET_EDUCATION_LTD to RE_NAVNET_EDUCATION_I using Cholesky (d.f. adjusted) Factors 	Response of VOL_NAVNET_EDUCATION_LTD to RE_NAVNET_EDUCATION_I using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_NDTV to RE_NDTV Innovation using Cholesky (d.f. adjusted) Factors 
284	NCC	No Effect	No Effect	No effect	Response of VOL_NETWORK18_MEDIA_INVESTMENTS_LTD to RE_NETWORK18_MEDIA_INVESTMENTS_LTD using Cholesky (d.f. adjusted) Factors 

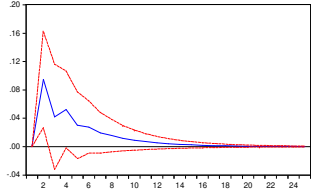
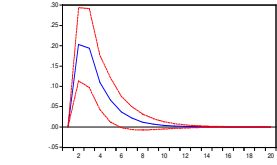
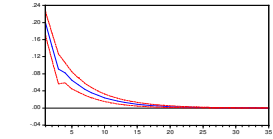
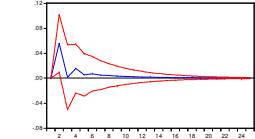
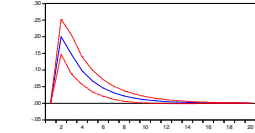
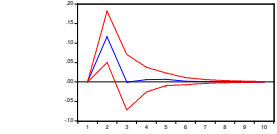
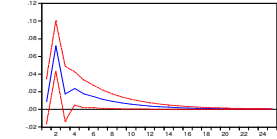
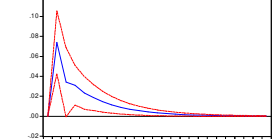
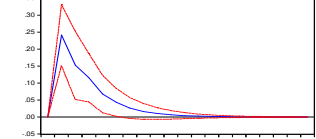
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
285	NDTV			No effect	No Effect
286	NETWORK18	No effect	No Effect		
287	NCL	No Effect	No Effect	No effect	No Effect
288	NHPC			No effect	No effect
289	NHPC	No Effect	No Effect	No effect	No Effect

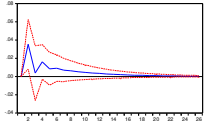
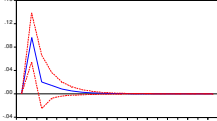
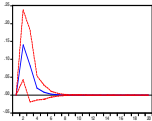
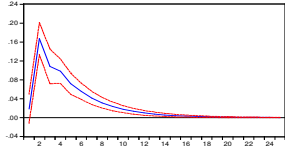
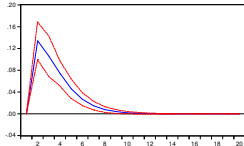
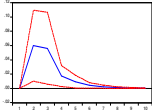
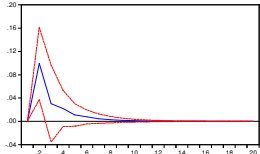
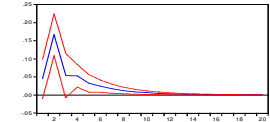
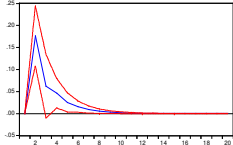
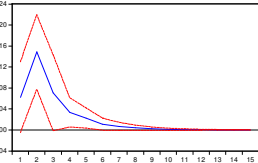
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
290	NIITLTD	Response of VOL_NIIT_LTD to RE_NIIT_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_NIIT_LTD to RE_NIIT_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_NMDC_LTD to RE_NMDC_LTD Innovation using Cholesky (d.f. adjusted) Factors
291	NIITLTD	No Effect	No Effect	No Effect	No Effect
292	NMDC	No effect	Response of VOL_NMDC_LTD to RE_NMDC_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_NMDC_LTD to RE_NMDC_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect
293	NMDC	No Effect	No Effect	No effect	Response of VOL_NODA_TOLL_BRIDGE_CO_LTD to RE_NODA_TOLL_BRIDGE_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors
294	NOCIL	No effect	Response of VOL_NOCIL_LTD to RE_NOCIL_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect

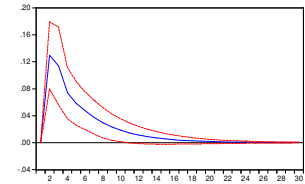
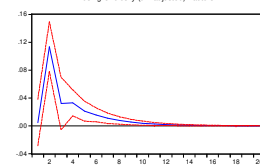
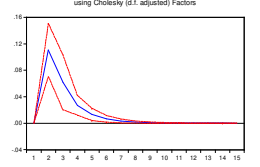
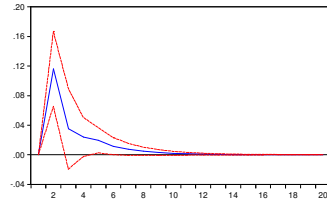
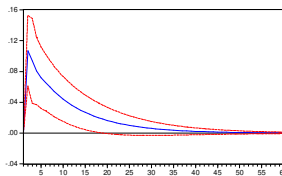
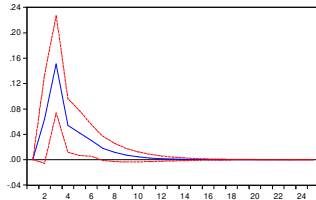
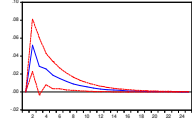
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
295	NOIDATOLL	No effect	No Effect	No effect	Response of VOL_OBEROI_REALTY_LTD. to RET_OBEROI_REALTY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
296	NTPC	No effect	No effect	Response of VOL_NTPC_LTD. to RET_NTPC_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
297	OBEROIRLT	No effect	Response of VOL_OBEROI_REALTY_LTD. to RET_OBEROI_REALTY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_OBEROI_REALTY_LTD. to RET_OBEROI_REALTY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	
298	OILINDIA	No effect	No effect	Response of VOL_OIL_INDIA_LTD. to RET_OIL_INDIA_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
299	OMAXE	No effect	No Effect	No effect	No effect

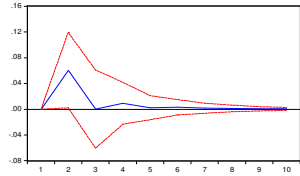
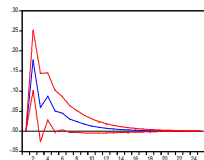
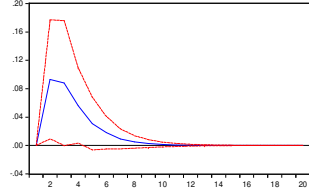
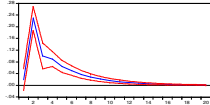
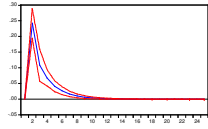
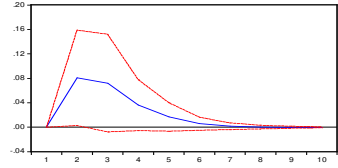
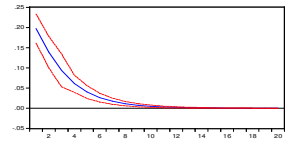
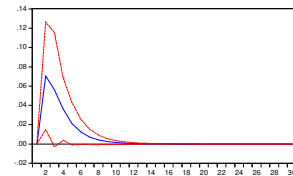
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
300	ONGC	No effect	Response of VOL_ONGC_NATURAL_GAS_CORPORATION_LTD to RET_ONGC_NATURAL_GAS_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD to RET_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
301	OPTOCIRCUI	Response of VOL_OPTOCIRCUITS_LTD to RET_OPTOCIRCUITS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_OPTOCIRCUITS_LTD to RET_OPTOCIRCUITS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
302	ORACLE	No effect	Response of VOL_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD to RET_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD to RET_ORACLE_FINANCIAL_SERVICES_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
303	OSWALSEEDS	Response of VOL_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD to RET_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD to RET_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD to RET_OSOWAL_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PARSNATH_DEVELOPERS_LTD to RET_PARSNATH_DEVELOPERS_LTD Innovation using Cholesky (d.f. adjusted) Factors 

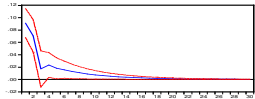
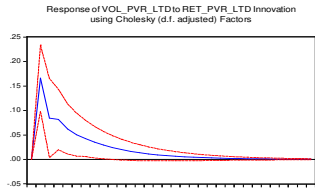
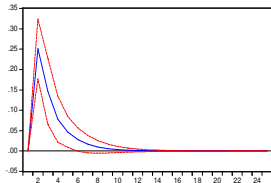
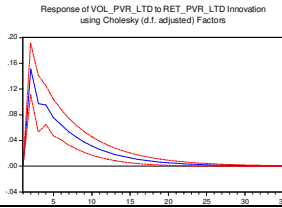
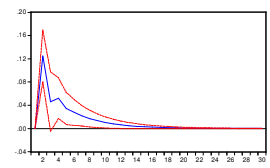
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
304	PAGEIND	No effect	Response of VOL_PAGE_INDUSTRIES_LTD to RET_PAGE_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PAGE_INDUSTRIES_LTD to RET_PAGE_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect
305	PARSVNATH	No effect	No Effect	Response of VOL_PARSVNATH_DEVELOPERS_LTD to RET_PARSVNATH_DEVELOPERS_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PIRAMAL_ENTERPRISES_LTD to RET_PIRAMAL_ENTERPRISES_LTD Innovation using Cholesky (d.f. adjusted) Factors
306	PATELENG	Response of VOL_PATEL_ENGINEERING_LTD to RET_PATEL_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PATEL_ENGINEERING_LTD to RET_PATEL_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PATEL_ENGINEERING_LTD to RET_PATEL_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PENINSULA_LAND_LTD to RET_PENINSULA_LAND_LTD Innovation using Cholesky (d.f. adjusted) Factors
307	PEL	No effect	Response of VOL_PIRAMAL_ENTERPRISES_LTD to RET_PIRAMAL_ENTERPRISES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PIRAMAL_ENTERPRISES_LTD to RET_PIRAMAL_ENTERPRISES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PENMAR_INDUSTRIES_LTD to RET_PENMAR_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors

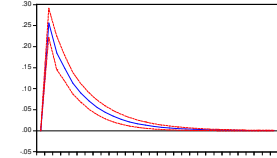
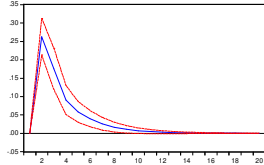
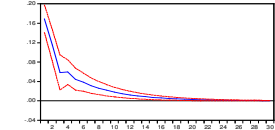
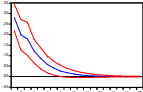
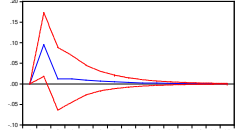
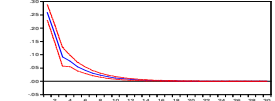
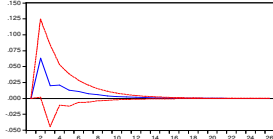
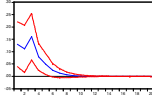
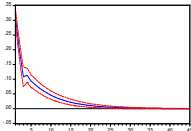
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
308	PENINLAND	Response of VOL_PENINSULA_LAND_LTD to RE_PENINSULA_LAND_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_PERSISTENT_SYSTEMS_LTD to RET_PERSISTENT_SYSTEMS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
309	PENIND	No effect	Response of VOL_PENINAR_INDUSTRIES_LTD to RE_PENINAR_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PENINAR_INDUSTRIES_LTD to RE_PENINAR_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
310	PERSISTENT	No effect	No effect	Response of VOL_PERSISTENT_SYSTEMS_LTD to RET_PERSISTENT_SYSTEMS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_POWER_FINANCE_CORPORATION_LTD to RET_POWER_FINANCE_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 
311	PETRONET	Response of VOL_PETRONET_LNG_LTD to RET_PETRONET_LNG_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PETRONET_LNG_LTD to RET_PETRONET_LNG_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_PFIZER_LTD to RET_PFIZER_LTD Innovation using Cholesky (d.f. adjusted) Factors 

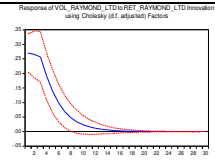
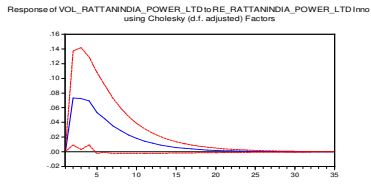
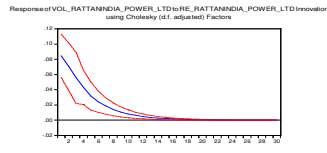
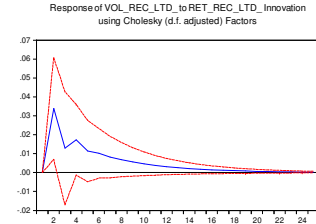
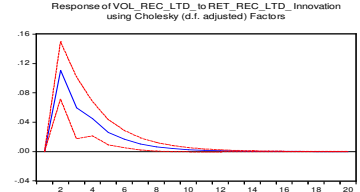
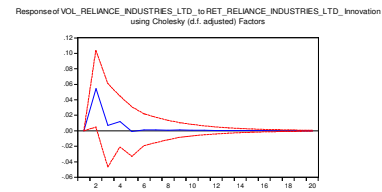
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
312	PFC	No effect	Response of VOL_POWER_FRANCE_CORPORATION_LTD. to RET_POWER_FRANCE_CORPORATION_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_POWER_FRANCE_CORPORATION_LTD. to RET_POWER_FRANCE_CORPORATION_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_POWER_FRANCE_CORPORATION_LTD. to RET_POWER_FRANCE_CORPORATION_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
313	PFIZER	Response of VOL_PFIZER_LTD to RET_PFIZER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PFIZER_LTD to RET_PFIZER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
314	PGHH	No effect	Response of VOL_PROCTER_GAMBLE_HOBBE AND HEALTH CARE_LTD to RET_PROCTER_GAMBLE_HOBBE AND HEALTH CARE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_PIDILITE_INDUSTRIES_LTD. to RET_PIDILITE_INDUSTRIES_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
315	PHOENIX	Response of VOL_PHOENIX_MILLS_LTD. to RET_PHOENIX_MILLS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PHOENIX_MILLS_LTD. to RET_PHOENIX_MILLS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PHOENIX_MILLS_LTD. to RET_PHOENIX_MILLS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	No effect

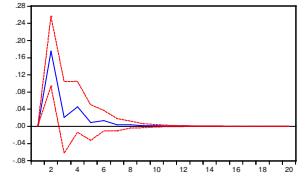
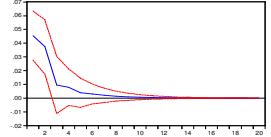
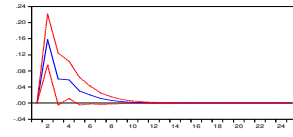
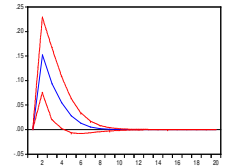
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
316	PIDILITE	No effect	No effect	No effect	Response of VOL_PUNJAB_NATIONAL_BANK to RET_PUNJAB_NATIONAL_BANK Innovation using Cholesky (d.f. adjusted) Factors 
317	PIIND	Response of VOL_PI_INDUSTRIES_LTD to RET_PI_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PI_INDUSTRIES_LTD to RET_PI_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PI_INDUSTRIES_LTD to RET_PI_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
318	PNB	No effect	No effect	Response of VOL_PUNJAB_NATIONAL_BANK to RET_PUNJAB_NATIONAL_BANK Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PRAJ_INDUSTRIES_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 
319	POWERGRID	No effect	Response of VOL_POWER_GRID_CORPORATION_OF_INDIA_LTD to RET_POWER_GRID_CORPORATION_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect

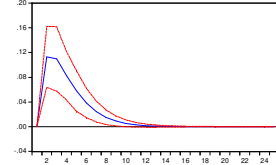
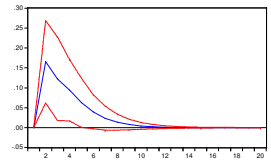
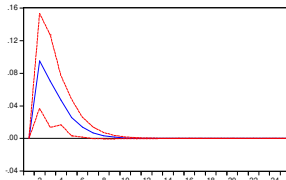
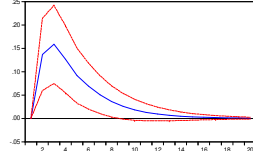
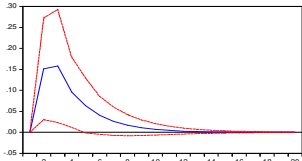
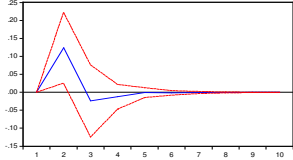
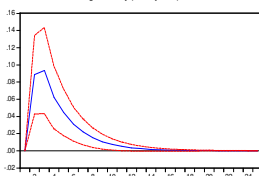
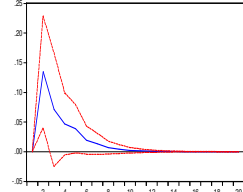
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
320	PRAJIND	Response of VOL_PRAJ_INDUSTRIES_LTD to RE_PRAJ_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_PRESTIGE_ESTATES_PROJECTS_LTD to RET_PRESTIGE_ESTATES_PROJECTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
321	PRAKASH	No effect	No Effect	No effect	Response of VOL_PRISM_CEMENT_LTD to RE_PRISM_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 
322	PRESTIGE	Response of VOL_PRESTIGE_ESTATES_PROJECTS_LTD to RET_PRESTIGE_ESTATES_PROJECTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PRESTIGE_ESTATES_PROJECTS_LTD to RET_PRESTIGE_ESTATES_PROJECTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
323	PRISMJOHNS N	Response of VOL_PRISM_CEMENT_LTD to RE_PRISM_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PRISM_CEMENT_LTD to RE_PRISM_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_PRISM_CEMENT_LTD to RE_PRISM_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect

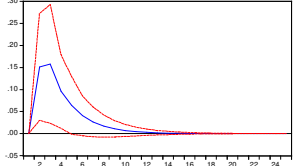
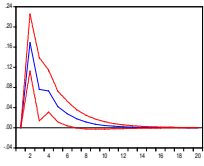
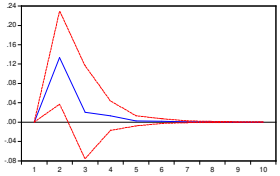
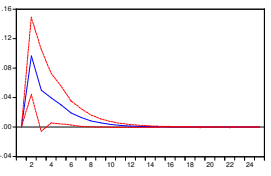
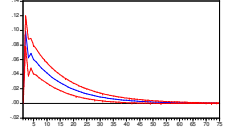
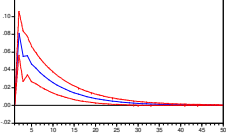
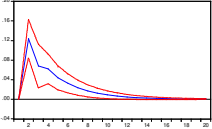
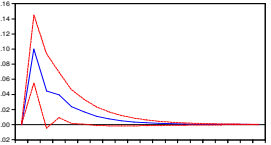
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
324	PFS	No effect		No effect	No effect
325	PTC	No effect	No Effect	No effect	
326	PURVA	No effect	No Effect	No effect	
327	PVR	No effect			No effect

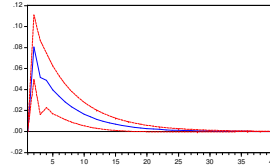
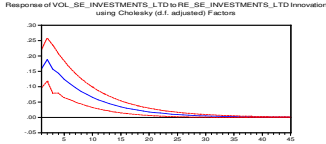
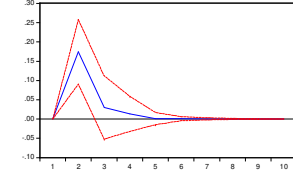
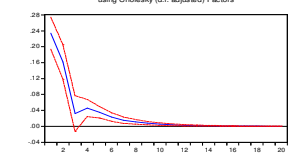
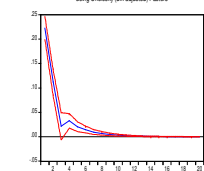
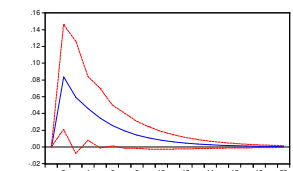
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
328	RADICO	No effect	Response of VOL_RADICO_KHATIAN_LTD to RET_RADICO_KHATIAN_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RADICO_KHATIAN_LTD to RET_RADICO_KHATIAN_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_RADICO_KHATIAN_LTD to RET_RADICO_KHATIAN_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RADICO_KHATIAN_LTD to RET_RADICO_KHATIAN_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect
329	RAJESHEXPO	No effect	Response of VOL_RAJESHEXPO_LTD to RET_RAJESHEXPO_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RAJESHEXPO_LTD to RET_RAJESHEXPO_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect
330	RALLIS	No effect	No Effect	No effect	Response of VOL_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD to RET_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD to RET_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors
331	RAMCOIND	Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RAMCO_INDUSTRIES_LTD to RET_RAMCO_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_RATNAMMETALS_AND_TUBES_LTD to RET_RATNAMMETALS_AND_TUBES_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RATNAMMETALS_AND_TUBES_LTD to RET_RATNAMMETALS_AND_TUBES_LTD Innovation using Cholesky (d.f. adjusted) Factors
332	RCF	Response of VOL_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD to RET_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD to RET_RASHTRYA_CHEMICALS_AND_FERTILIZERS_LTD Innovation using Cholesky (d.f. adjusted) Factors	No Effect	No effect	No effect

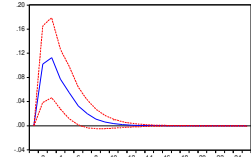
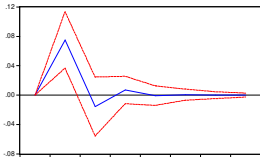
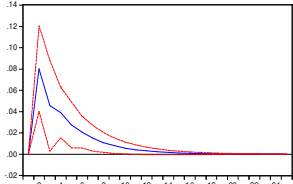
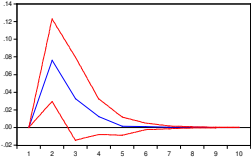
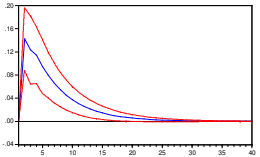
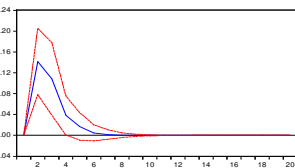
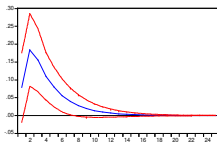
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
333	RATNAMANI	No Effect	No Effect	No effect	
334	RTNINDIA			No effect	No effect
335	RAYMOND	No Effect	No Effect		No Effect
336	REC	No effect			

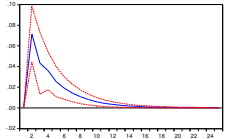
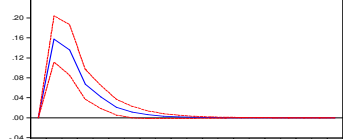
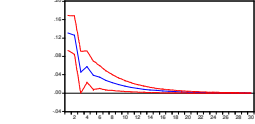
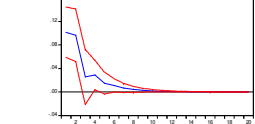
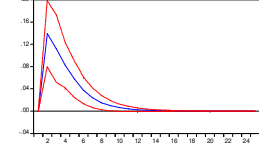
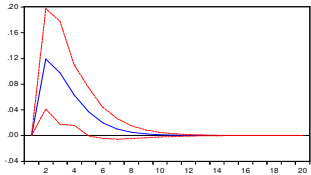
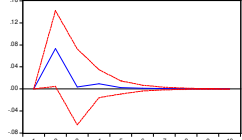
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
337	REDINGTON	No Effect	No Effect	No effect	Response of VOL_RELIANCE_CAPITAL_LTD to RE_RELIANCE_CAPITAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 
338	RELIANCE	No effect	No effect	No effect	No effect
339	RELCAPITAL	No effect	Response of VOL_RELIANCE_CAPITAL_LTD to RE_RELIANCE_CAPITAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_RELIANCE_CAPITAL_LTD to RE_RELIANCE_CAPITAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
340	RCOM	No effect	No Effect	No effect	Response of VOL_RELIANCE_INFRASTRUCTURE_LTD to RE_RELIANCE_INFRASTRUCTURE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
341	RELIANCE	No effect	No Effect	No effect	No effect

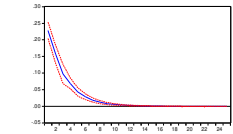
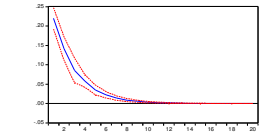
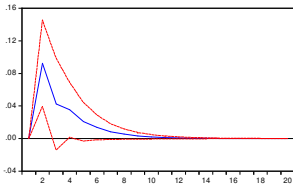
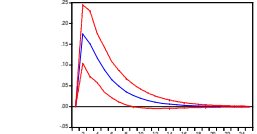
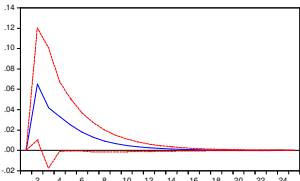
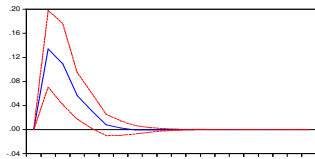
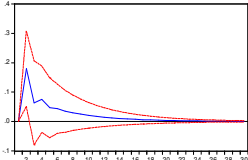
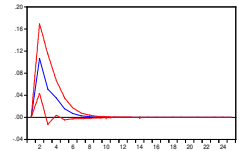
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
342	RELINFRA	No effect	No Effect	Response of VOL_RELINCE_INFRASTRUCTURE_LTD to RE_RELINCE_INFRASTRUCTURE_LTD Inn using Cholesky (d.f. adjusted) Factors 	Response of VOL_RELIGARE_ENTERPRISES_LTD to RE_RELIGARE_ENTERPRISES_LTD Innovation using Cholesky (d.f. adjusted) Factors 
343	RPOWER	No effect	No Effect	Response of VOL_RELINCE_POWER_LTD to RE_RELINCE_POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_REPCO_HOME_FINANCE_LTD to RE_REPCO_HOME_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
344	RELIGARE	No effect	No Effect	No effect	Response of VOL_ROLTA_INDIA_LTD to RE_ROLTA_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
345	REPCOHOME	Response of VOL_REPCO_HOME_FINANCE_LTD to RE_REPCO_HOME_FINANCE_LTD using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_REPCO_HOME_FINANCE_LTD to RE_REPCO_HOME_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SADBHAV_ENGINEERING_LTD to RE_SADBHAV_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors 

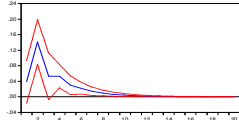
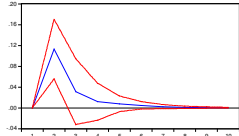
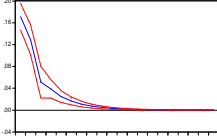
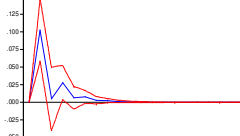
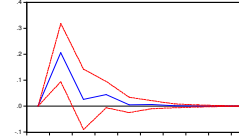
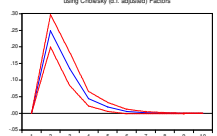
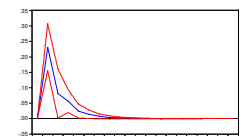
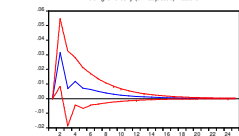
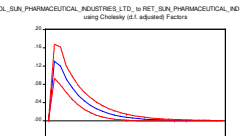
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
346	ROLTA	No effect	No Effect	Response of VOL_ROLTA_INDIA_LTD to RE_ROLTA_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_STEEL_AUTHORITY_OF_INDIA_LTD to RET_STEEL_AUTHORITY_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
347	SADBHAV	Response of VOL_SADBHAV_ENGINEERING_LTD to RE_SADBHAV_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_SADBHAV_ENGINEERING_LTD to RE_SADBHAV_ENGINEERING_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
348	SAI	Response of VOL_STEEL_AUTHORITY_OF_INDIA_LTD to RET_STEEL_AUTHORITY_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_STEEL_AUTHORITY_OF_INDIA_LTD to RET_STEEL_AUTHORITY_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_STEEL_AUTHORITY_OF_INDIA_LTD to RET_STEEL_AUTHORITY_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_STATE_BANK_OF_INDIA to RET_STATE_BANK_OF_INDIA Innovation using Cholesky (d.f. adjusted) Factors 
349	SANOFI	No Effect	No Effect	No effect	No effect

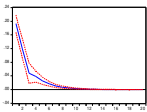
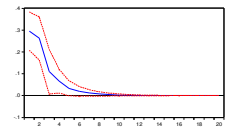
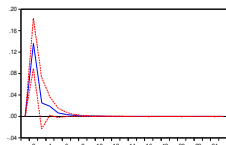
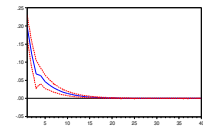
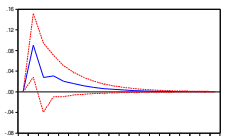
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
350	SBI	No effect	No effect	Response of VOL_STATE_BANK_OF_INDIA to RET_STATE_BANK_OF_INDIA Innovation using Cholesky (d.f. adjusted) Factors 	No effect
351	SEINVEST	No effect	Response of VOL_SE_INVESTMENTS_LTD to RE_SE_INVESTMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No Effect
352	SHANTIGEAR	Response of VOL_SHANTHI_GEAR_LTD to RE_SHANTHI_GEAR_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SHANTHI_GEAR_LTD to RE_SHANTHI_GEAR_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
353	SCI	No Effect	Response of VOL_SHIPPING_CORPORATION_OF_INDIA_LTD to RET_SHIPPING_CORPORATION_OF_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_SHREE_CEMENT_LTD to RET_SHREE_CEMENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 

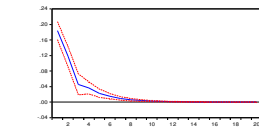
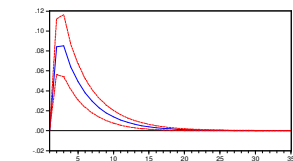
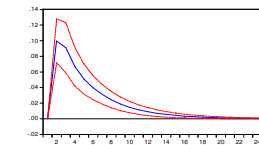
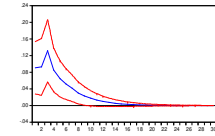
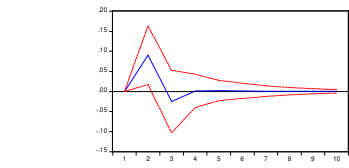
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
354	SHOPPERSTO P	No effect	No Effect	No effect	Response of VOL_SHREE_RENUKA_SUGARS_LTD to RE_SHREE_RENUKA_SUGARS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
355	SHREECEM	No effect	Response of VOL_SHREE_CEMENT_LTD to RET_SHREE_CEMENT_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SHREE_CEMENT_LTD to RET_SHREE_CEMENT_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
356	RENUKA	Response of VOL_SHREE_RENUKA_SUGARS_LTD to RE_SHREE_RENUKA_SUGARS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_SHREE_RENUKA_SUGARS_LTD to RE_SHREE_RENUKA_SUGARS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SIEMENS_LTD to RET_SIEMENS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
357	SRTRANS	No Effect	No Effect	No effect	Response of VOL_SIMPLEX_INFRASTRUCTURES_LTD to RET_SIMPLEX_INFRASTRUCTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors 

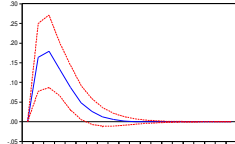
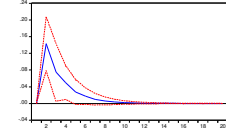
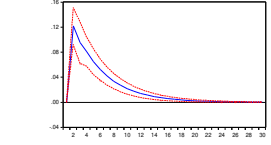
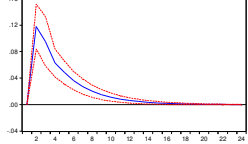
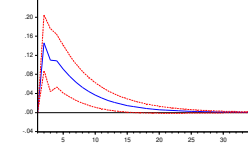
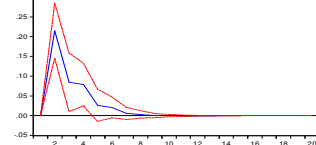
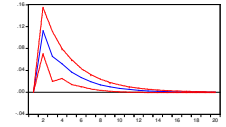
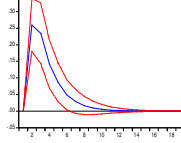
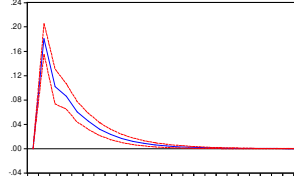
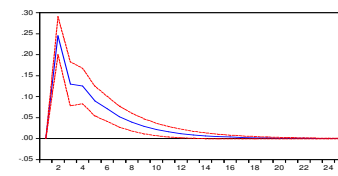
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
358	SIEMENS	No effect	Response of VOL_SIEMENS_LTD to RET_SIEMENS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SIEMENS_LTD to RET_SIEMENS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
359	SIMPLEXINF	Response of VOL_SIMPLEX_INFRASTRUCTURES_LTD to RET_SIMPLEX_INFRASTRUCTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SIMPLEX_INFRASTRUCTURES_LTD to RET_SIMPLEX_INFRASTRUCTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SIMPLEX_INFRASTRUCTURES_LTD to RET_SIMPLEX_INFRASTRUCTURES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SOBHA_LTD to RET_SOBHA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
360	SKFINDIA	No Effect	No Effect	No effect	No effect
361	SOBHA	No effect	No Effect	No effect	No Effect
362	JTEKT	Response of VOL_SONAL_KOYO_STEERING_SYSTEMS_LTD to RET_SONAL_KOYO_STEERING_SYSTEMS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	No effect

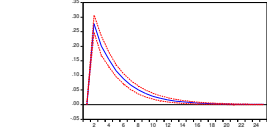
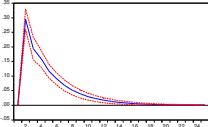
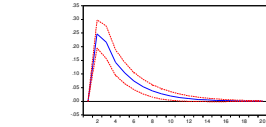
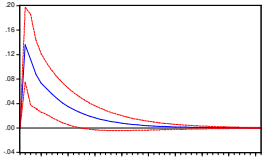
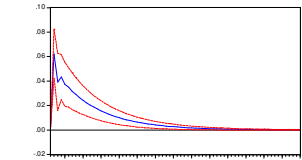
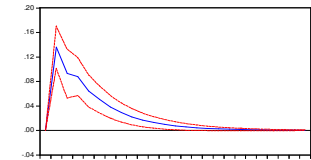
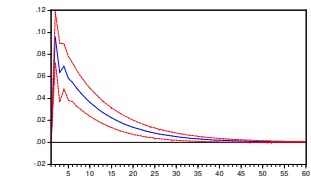
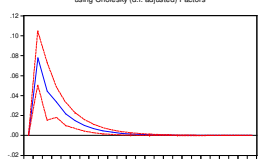
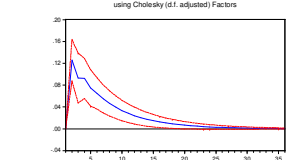
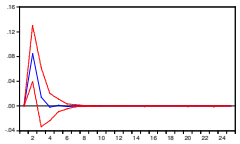
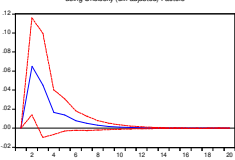
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
363	SONATASOFT W	Response of VOL_SONATA_SOFTWARE_LTD to RET_SONATA_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_SONATA_SOFTWARE_LTD to RET_SONATA_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_SONATA_SOFTWARE_LTD to RET_SONATA_SOFTWARE_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_SREI_INFRASTRUCTURE_FINANCE_LTD to RE_SREI_INFRASTRUCTURE_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors 			
364	SOUTHBANK	Response of VOL_SOUTH_INDIAN_BANK_LTD to RE_SOUTH_INDIAN_BANK_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_SRF_LTD to RET_SRF_LTD Innovation using Cholesky (d.f. adjusted) Factors 
365	SREINFRA	No effect	No Effect	No effect	Response of VOL_SHRIRAM_FINANCE_LTD to RET_SHRIRAM_FINANCE_LTD Innovation using Cholesky (d.f. adjusted) Factors 
366	SRF	No effect	No effect	No effect	Response of VOL_STERILITE_TECHNOLOGIES_LTD to RE_STERILITE_TECHNOLOGIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 

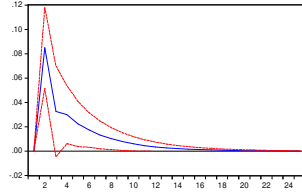
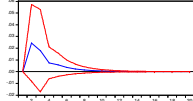
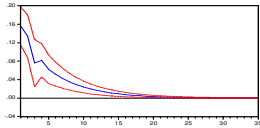
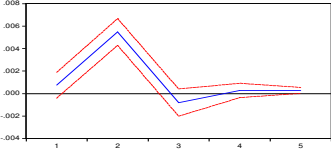
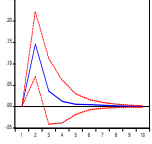
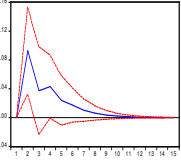
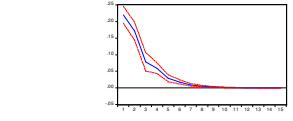
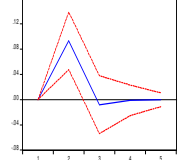
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
367	SRIRAMFIN		No effect	No effect	No Effect
368	STLTECH				
369	SUNDRMFAST	No Effect	No Effect	No effect	No effect
370	SUNDARAMFIN	No effect			No effect
371	SUNPHARMA		No effect		No effect

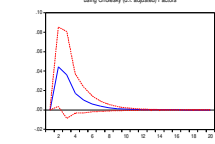
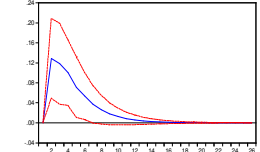
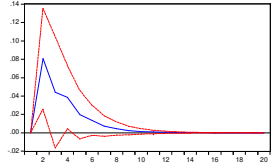
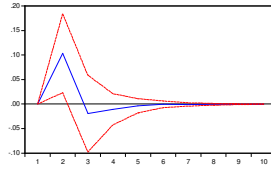
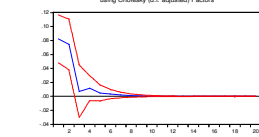
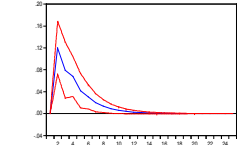
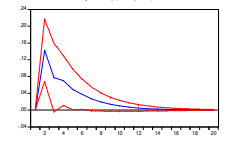
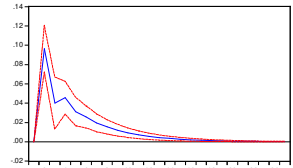
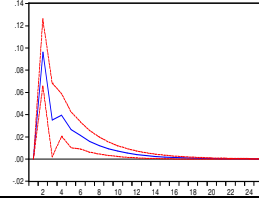
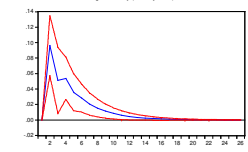
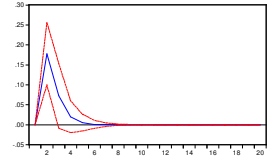
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
372	SPARC	No effect	Response of VOL_SPARC_ADVANCED_RESEARCH_COMPANY_LTD to RET_SPARC_ADVANCED_RESEARCH_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No Effect
373	SUNTECH	No effect	No Effect	No effect	No effect
374	SUNTV		No Effect	No effect	Response of VOL_SUPREME_PETROCHEM_LTD to RET_SUPREME_PETROCHEM_LTD Innovation using Cholesky (d.f. adjusted) Factors 
375	SUPREMEIND	No effect	Response of VOL_SUPREME_INDUSTRIES_LTD to RET_SUPREME_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
376	SPLPETRO	Response of VOL_SUPREME_PETROCHEM_LTD to RET_SUPREME_PETROCHEM_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_SUPREME_PETROCHEM_LTD to RET_SUPREME_PETROCHEM_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
377	SUVEN	No effect		No effect	No effect
378	SUZLON			No effect	No effect
379	SWANCORP	No effect	No Effect	No effect	No effect
380	SWARAJENG	No effect	No Effect	No effect	
381	TNPL		No Effect	No effect	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
382	TATACHEM	No Effect	No Effect	No effect	Response of VOL_TATA_COMMUNICATIONS_LTD. to RET_TATA_COMMUNICATIONS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
383	TATACOFFEE	No effect	No Effect	No effect	Response of VOL_TATA_CONSUMER_PRODUCTS_LTD. to RET_TATA_CONSUMER_PRODUCTS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 
384	TATACOM	Response of VOL_TATA_COMMUNICATIONS_LTD. to RET_TATA_COMMUNICATIONS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_COMMUNICATIONS_LTD. to RET_TATA_COMMUNICATIONS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_COMMUNICATIONS_LTD. to RET_TATA_COMMUNICATIONS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_ELXSI_LTD to RET_TATA_ELXSI_LTD Innovation using Cholesky (d.f. adjusted) Factors 
385	TATACONSUM	No effect	No effect	Response of VOL_TATA_CONSUMER_PRODUCTS_LTD. to RET_TATA_CONSUMER_PRODUCTS_LTD. Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 
386	TATAELXSI	Response of VOL_TATA_ELXSI_LTD to RET_TATA_ELXSI_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_ELXSI_LTD to RET_TATA_ELXSI_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect

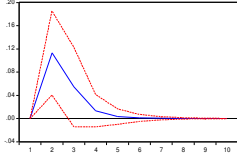
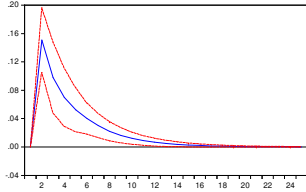
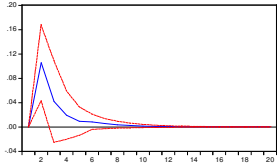
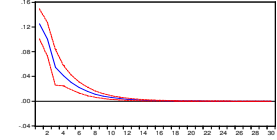
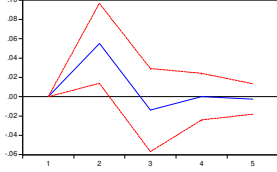
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
387	TATAINVEST	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_POWER_CO_LTD to RET_TATA_POWER_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors 
388	TATAMOTORS	Response of VOL_TATA_MOTORS_LTD to RET_TATA_MOTORS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_MOTORS_LTD to RET_TATA_MOTORS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
389	TATAPOWER	Response of VOL_TATA_POWER_CO_LTD to RET_TATA_POWER_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_POWER_CO_LTD to RET_TATA_POWER_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_POWER_CO_LTD to RET_TATA_POWER_CO_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TATA_STEEL_LTD to RET_TATA_STEEL_LTD Innovation using Cholesky (d.f. adjusted) Factors 
390	TATASTLLP	No effect	No Effect	No effect	Response of VOL_TATA_CONSULTANCY_SERVICES_LTD to RET_TATA_CONSULTANCY_SERVICES_LTD Innovation using Cholesky (d.f. adjusted) Factors 

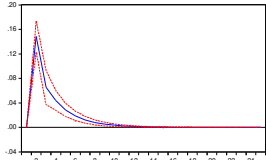
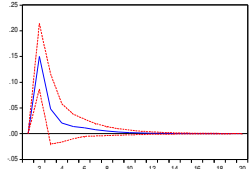
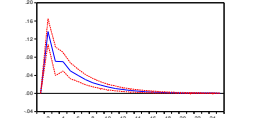
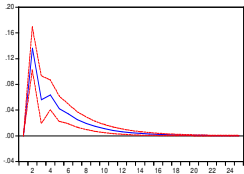
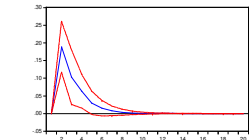
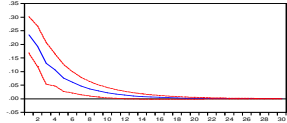
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
391	TATASTEEL	No effect	No effect	Response of VOL_TATA_STEEL_LTD to RET_TATA_STEEL_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect
392	TCS	No effect	No effect	Response of VOL_TATA_CONSULTANCY_SERVICES_LTD to RET_TATA_CONSULTANCY_SERVICES_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
393	TDPOWERSYS	Response of VOL_TD_POWER_SYSTEMS_LTD to RET_TD_POWER_SYSTEMS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of MKT_RETURN to RET_TD_POWER_SYSTEMS_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD to RET_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 
394	TECHM	No effect	No effect	No effect	No Effect
395	ORISSAIND	Response of VOL_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD to RET_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD to RET_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD to RET_ORISSA_MINERALS_DEVELOPMENT_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect

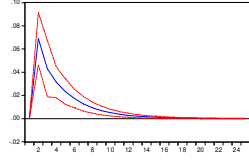
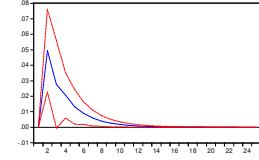
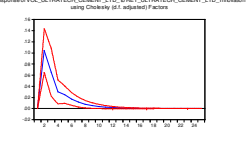
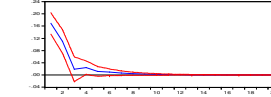
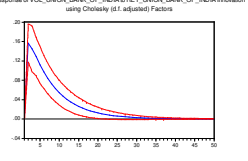
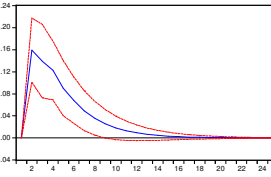
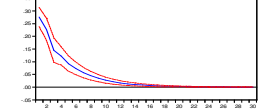
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
396	RAMCOCEM	No Effect	No Effect	Response of VOL_THE_RAMCO_CEMENTS_LTD to RET_THE_RAMCO_CEMENTS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to RET_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors  Response of VOL_TITAN_COMPANY_LTD to RET_TITAN_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 
397	THERMAX	No Effect	No Effect	No effect	
398	THOMASCOOK	Response of VOL_THOMAS_COOK_INDIA_LTD to RET_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to RET_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to RET_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TORRENT_PHARMACEUTICALS_LTD to RET_TORRENT_PHARMACEUTICALS_LTD Innovation using Cholesky (d.f. adjusted) Factors 
399	TITAN	Response of VOL_TITAN_COMPANY_LTD to RET_TITAN_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TITAN_COMPANY_LTD to RET_TITAN_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TITAN_COMPANY_LTD to RET_TITAN_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TORRENT_POWER_LTD to RET_TORRENT_POWER_LTD Innovation using Cholesky (d.f. adjusted) Factors 

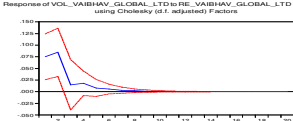
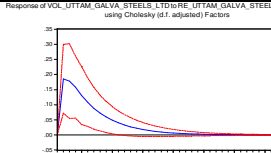
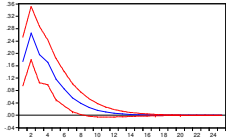
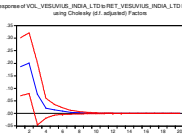
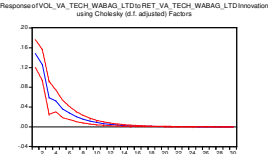
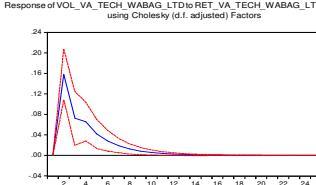
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
400	TORNTPHARM	No effect	Response of VOL_TORRENT_PHARMACEUTICALS_LTD. to RET_TORRENT_PHARMACEUTICALS_LTD. Inno using Cholesky (d.f. adjusted) Factors	No effect	No effect
401	TORNTPOWER	Response of VOL_TORRENT_POWER_LTD. to RET_TORRENT_POWER_LTD. Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_TORRENT_POWER_LTD. to RET_TORRENT_POWER_LTD. Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_TORRENT_POWER_LTD. to RET_TORRENT_POWER_LTD. Innovation using Cholesky (d.f. adjusted) Factors	No effect
402	TREEHOUSE	No effect	Response of VOL_TREEHOUSE_EDUCATION_ACCESSORIES_LTD to RET_TREEHOUSE_EDUCATION_ACCESSORIES_LTD Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_TRIDENT_LTD to RET_TRIDENT_LTD Innovation using Cholesky (d.f. adjusted) Factors
403	TRENT	No effect	No Effect	Response of VOL_TRENT_LTD. to RET_TRENT_LTD. Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_TRENT_LTD. to RET_TRENT_LTD. Innovation using Cholesky (d.f. adjusted) Factors

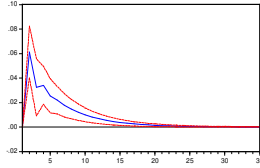
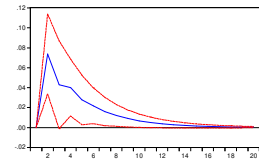
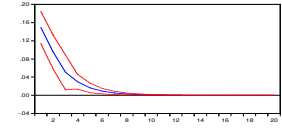
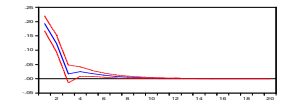
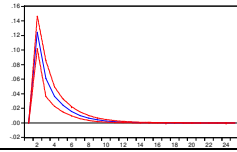
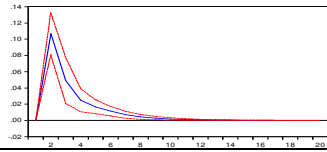
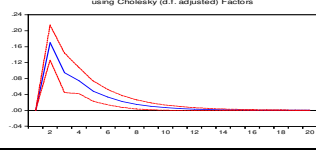
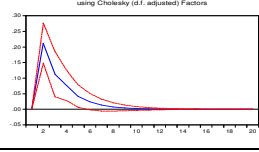
C

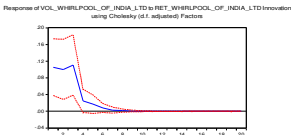
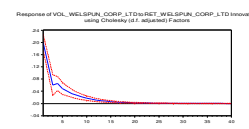
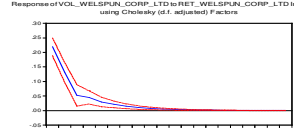
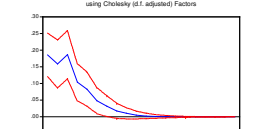
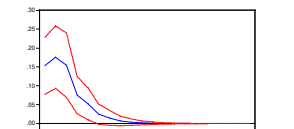
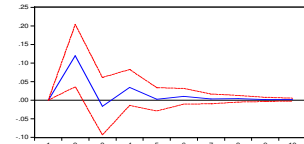
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
404	TBZ	Response of VOL_TRBKOVANDAS_BHMJ_ZAVERI_LTD to RE_TRBKOVANDAS_BHMJ_ZAVERI_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_TRIDENT_LTD to RE_TRIDENT_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_TV18_BROADCAST_LTD to RE_TV18_BROADCAST_LTD Innovation using Cholesky (d.f. adjusted) Factors 
405	TRIDENT	No effect	No Effect	No effect	No effect
406	TTKPRESTIG	Response of VOL_TV18_BROADCAST_LTD to RE_TV18_BROADCAST_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_TV18_BROADCAST_LTD to RE_TV18_BROADCAST_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
407	TV18BRDCST	No effect	No effect	No effect	No effect

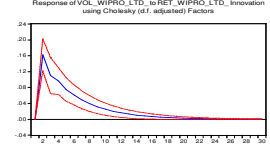
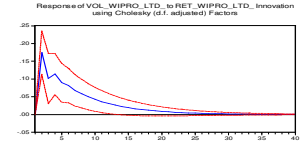
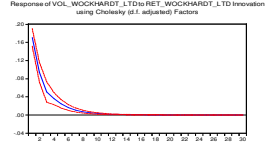
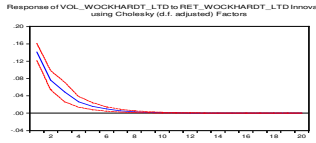
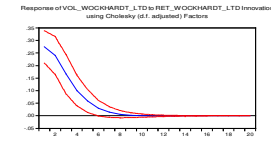
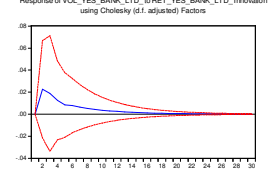
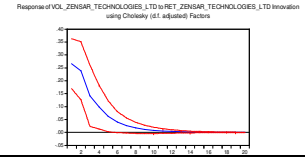
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
408	TVSMOTOR	Response of VOL_TVS_MOTOR_COMPANY_LTD. to RET_TVS_MOTOR_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_TVS_MOTOR_COMPANY_LTD. to RET_TVS_MOTOR_COMPANY_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
409	TVTODAY	No effect	No effect	No effect	No effect
410	UBL	Response of VOL_UNITED_BREWRIES_LTD to RET_UNITED_BREWRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_UNITED_BREWRIES_LTD to RET_UNITED_BREWRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_UNITED_BREWRIES_LTD to RET_UNITED_BREWRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 
411	UCOBANK	No Effect	No Effect	No effect	Response of VOL_UCO_BANK to RET_UCO_BANK Innovation using Cholesky (d.f. adjusted) Factors 
412	UFLEX	No effect	No effect	No effect	No effect

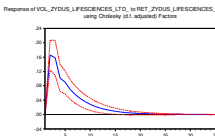
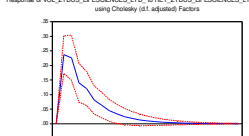
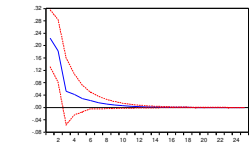
Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
413	ULTRACEMCO	Response of VOL_ULTRATECH_CEMENT_LTD. to RET_ULTRATECH_CEMENT_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ULTRATECH_CEMENT_LTD. to RET_ULTRATECH_CEMENT_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_ULTRATECH_CEMENT_LTD. to RET_ULTRATECH_CEMENT_LTD_Innovation using Cholesky (d.f. adjusted) Factors 	No effect
414	UNICHEMLAB	No effect	Response of VOL_UNICHEM_LABORATORIES_LTD to RET_UNICHEM_LABORATORIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No Effect
415	UNIONBANK	No effect	No effect	Response of VOL_UNION_BANK_OF_INDIA to RET_UNION_BANK_OF_INDIA Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_UNION_BANK_OF_INDIA to RET_UNION_BANK_OF_INDIA Innovation using Cholesky (d.f. adjusted) Factors 
416	UPL	No effect	No Effect	No effect	No effect
417	USHAMART	No Effect	Response of VOL_UTTAM_GALVA_STEELS_LTD to RET_UTTAM_GALVA_STEELS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
418	UTTAMSTL	No effect		No effect	
419	VAIBHAVGBL	No effect	No Effect	No effect	
420	VAKRANGEE	No effect	No Effect	No effect	No effect
421	VTLLTD	No Effect	No Effect	No effect	
422	WABAG		No effect		No Effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
423	VEDL	Response of VOL_VEDANTA_LTD_ to RET_VEDANTA_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_VEDANTA_LTD_ to RET_VEDANTA_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 	No effect
424	VESUVIUS	No Effect	No effect	No effect	No effect
425	VINATIORGA	No Effect	Response of VOL_VINATI_ORGANICS_LTD to RET_VINATI_ORGANICS_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No Effect
426	VIPIND	No effect	Response of VOL_VIP_INDUSTRIES_LTD to RET_VIP_INDUSTRIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No Effect
427	VOLTAS	Response of VOL_VOLTAS_LTD_ to RET_VOLTAS_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_VOLTAS_LTD_ to RET_VOLTAS_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_VOLTAS_LTD_ to RET_VOLTAS_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_VOLTAS_LTD_ to RET_VOLTAS_LTD_ Innovation using Cholesky (d.f. adjusted) Factors 

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
428	VSTIND	No Effect	No effect	No effect	No effect
429	WABCO	No Effect	No effect	No effect	No effect
430	WELCORP	No effect	No Effect	No effect	
431	WELSPUNLIV	   	No Effect	No effect	No effect
432	WHEELS		No Effect	No effect	No effect

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
433	WHIRLPOOL	No Effect	No effect		No effect
434	WIPRO	No effect	No effect		
435	WOCKPHARM A			No effect	
436	YESBANK	No effect	No Effect		No effect
437	ZEEL	No Effect	No Effect	No effect	No effect
438	ZENSARTECH	No Effect	No effect	No effect	

Sl. No	Symbol	2014-22	White swan	Grey swan	Black swan
439	ZYDUSLIFE	No effect	No Effect		
440	ZYDUSWELL	No Effect	No effect	No effect	
Total		124	129	179	191

Source: Computed data

Appendix III*IRF Statistics of DE Over 2014-22, White Swan, Grey Swan and Black swan Phases*

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
1	3MINDIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	ABAN	2	6.9	2	3	1	22.9	1	84	2	16.8	2	22	-	-	-	-
3	ABB	1	17.9	2	19	-	-	-	-	-	-	-	--	1	19.9	1	25
4	ACCC	-	-	-	-	-	-	-	-	1	14	2	21	1	16	1	10
5	ADANIENT	1	16	3	25	-	-	-	-	1	15.2	2	17	-	-	-	-
6	ADANIPTS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	SUNDROP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	AIAENG	1	5	2	2	-	-	-	-	-	-	-	-	-	-	-	-
9	AJANTAPHARM	-	-	-	-	-	-	-	-	1	17.9	1	15	1	19.6	1	11
10	AKZOINDIA	-	-	-	-	-	-	-	-	1	12.3	1	9	-	-	-	-
11	APLLTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	ALLCARGO	-	-	-	-	-	-	-	-	2	10.2	2	14	-	-	-	-
13	ALSTOM	-	-	-	-	-	-	-	-	3	14.4	3	37	-	-	-	-
14	ALSTOMTD	-	-	-	-	-	-	-	-	-	-	--	-	-	-	-	-
15	ARE&M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	AMBUJACEM	-	-	-	-	-	-	-	-	2	7.6	2	18	-	-	-	-
17	ANANTRAJ	1	19	1	33	1	19.5	1	30	1	20.9	1	29	1	21.5	1	20
18	ANSALPI	-	-	-	-	2	14.1	2	27	-	-	-	-	-	-	-	-
19	APARIND	-	-	-	-	-	-	-	-	-	-	-	-	2	16.4	3	15
20	APOLLOHOSP	-	-	-	-	-	-	-	-	1	12.1	1	12	1	12.1	1	13
21	APOLLOTYRE	1	9.6	1	34	-	-	-	-	1	15.7	1	49	1	19.8	23	-
22	AARTIIND	1	9	2	58	1	12.4	1	14	1	10	2	15	-	-	-	-
23	ASAHIINDIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	ASHOK	-	-	-	-	-	-	-	-	1	4.2	2	16	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
25	ASHOKA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	ASIANPAINT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	ASTRAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	ASTRAZENCA	1	23	1	12	1	23.1	1	13	-	-	-	-	-	-	-	-
29	ATUL	1	19.6	1	12	1	17.6	1	11	-	-	-	-	-	-	-	-
30	AUROBINDO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	AUTOAXLES	-	-	-	-	-	-	-	-	-	-	-	-	2	15.4	2	15
32	AXIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	JPINFRA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	BAJAJ-AUTO	-	-	-	-	-	-	-	-	2	6.4	2	3	-	-	-	-
35	BAJAJCON	-	-	-	-	-	-	-	-	-	-	-	-	2	8.6	2	3
36	BAJAJELEC	-	-	-	-	1	17.7	1	15	-	-	-	-	2	18.2	2	12
37	BAJFINANCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	BAJAJFINSV	-	-	-	-	-	-	-	-	2	9.6	2	20	-	-	-	-
39	BAJAJHIND	2	6.2	2	3	1	19.7	1	25	-	-	-	-	-	-	-	-
40	BAJAJHLDNG	1	16.4	9	1	1	16.4	1	9	-	-	-	-	-	-	-	--
41	BALMERLAWRIE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	BALRAMCHIN	-	-	-	-	-	-	-	-	1	10.3	1	17	-	-	-	-
43	BANKBARODA	-	-	-	-	-	-	-	-	1	19.4	1	24	3	12.7	3	15
44	BANKINDIA	-	-	-	-	-	-	-	-	1	23	1	10	1	19.3	1	17
45	BASF	-	-	-	-	-	-	-	-	-	-	-	-	1	28.3	1	13
46	BATAINDIA	-	-	-	-	-	-	-	-	1	28.4	1	15	-	-	-	-
47	BEML	-	-	-	-	-	-	-	-	1	8.6	1	13	1	30	1	15
48	BERGEPAIN	-	-	-	-	-	-	-	-	1	25.9	1	15	2	8.3	2	5
49	BFUTILITIE	1	24.1	1	25	1	24.7	1	22	2	11.2	2	15	-	-	-	-
50	BGREENERGY	2	5.5	2	3	-	-	-	-	-	-	-	-	2	15.8	2	13
51	AIRTELPP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[illegible]

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
79	CIPLA	-	-	-	-	-	-	--	-	1	11.9	1	13	-	-	-	-
80	CUB	-	-	-	-	-	-	-	-	2	8.1	2	15	3	12	3	14
81	CIPL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	COALINDIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	COLGATE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	CONCOR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	COROMANDEL	-	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-
86	CRISIL	-	-	-	-	-	-	-	-	3	10.8	3	19	-	-	-	-
87	CROMPTON	3	5	3	19	-	-	-	-	-	-	-	-	3	31	3	21
88	CUMMINS	-	-	-	-	-	-	-	-	1	23.3	1	23	-	-	-	-
89	CYIENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	DABURE	-	-	-	-	-	---	-	-	-	-	-	-	-	-	-	-
91	DBCORP	-	-	-	-	-	-	-	-	2	24.6	2	38	-	-	-	-
92	DBREALTY	2	20.6	2	20	1	20.9	1	15	-	-	-	-	2	24.9	2	36
93	DCBBANK	2	7.1	2	14	-	-	-	-	-	-	-	-	-	-	-	-
94	DCMSHRIRAM	-	-	-	-	-	-	-	-	1	26.9	1	16	1	25.7	1	17
95	DEEPAKFERT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96	DELTACORP	2	8	2	7	-	-	-	-	-	-	-	-	-	-	-	-
97	DEN	-	-	-	-	-	-	-	-	2	8.9	2	16	2	11.3	2	26
98	DHANBANK	2	7.8	2	15	1	15.1	1	17	-	-	-	-	2	11.5	2	13
99	DIVIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	DLF	-	-	-	-	-	-	-	-	2	8.5	2	13	-	-	-	-
101	DREDGECORP	2	10	2	7	-	-	-	-	-	-	-	-	-	-	-	-
102	DRREDDY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	DYNAMATECH	-	-	-	-	-	-	-	-	1	25.3	1	20	-	-	-	-
104	ECLERX	-	-	-	-	-	-	-	-	1	19.2	1	20	1	30	1	25
105	EDELWEISS	1	16	1	21	1	15	1	19	-	-	-	-	2	19.5	2	16

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
106	EICHERMOT	-	-	-	-	-	-	-	-	1	29.3	1	20	-	-	-	-
107	EIDPARRY	-	-	-	-	-	-	-	-	-	-	-	-	1	29	1	28
108	EIHLTD	-	-	-	-	1	16.8	1	16	1	26.6	1	29	-	-	-	-
109	ELECTROSL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	ELGIEQUIP	-	-	-	-	1	18.3	1	10	2	12.3	2	14	-	-	-	-
111	EMAMILTD	-	-	-	-	-	-	-	-	1	12.9	1	22	2	16.5	2	16
112	ENGINEERSIN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	ENIL	-	-	-	-	-	-	-	-	2	7.9	2	15	-	-	-	-
114	EROSMEDIA	-	-	-	-	-	-	-	-	1	25.4	1	15	2	8.8	2	13
115	ESABINDIA	1	19.7	1	20	1	16.1	1	16	-	-	-	-	2	24.9	2	16
116	ESCORT	-	-	-	-	-	-	-	-	1	11.7	1	19	-	-	-	-
117	EPL	-	-	-	-	-	-	-	-	-	-	-	-	2	15.2	2	16
118	EXIDE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	SCHAEFFLER	-	-	-	-	-	--	-	-	1	25.3	1	17	-	-	-	-
120	FDCLTD	-	-	-	-	1	18.9	1	14	-	-	-	-	-	-	-	-
121	FEDERALBNK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
122	FEDERALMOGUL	-	-	-	-	-	-	-	-	2	22.9	2	17	-	-	-	-
123	FMGOETZE	2	6.3	2	2	1	19.1	1	16	-	-	-	-	2	14.3	2	15
124	FINCABLES	-	-	-	-	-	-	-	-	-	-	-	-	1	19.2	1	27
125	FINPIPE	-	-	-	-	-	-	-	-	-	-	-	-	1	17	1	14
126	FSL	1	16.5	1	21	-	-	-	-	2	20.5	2	20	-	-	-	-
127	FLEXITUFF	-	-	-	-	3	10.2	3	39	-	-	-	-	2	20.5	2	20
128	FORTIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
129	FCONSUMER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130	FRETAIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
131	GABRIEL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
132	GAIL	-	-	-	-	-	-	-	-	2	13.5	2	16	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
133	GAMMONIND	2	6.9	2	12	-	-	-	-	-	-	-	-	2	20.9	2	24
134	GATILTD	-	-	-	-	1	22.4	1	16	-	-	-	-	-	-	-	-
135	GDL	-	-	-	-	-	-	-	-	2	9.1	2	15	-	-	-	-
136	GEOJITHFSL	2	9.9	2	14	1	15.2	1	23	1	20.9	1	17	2	11.5	2	13
137	GHCLLTD	1	18.6	1	20	1	19.1	1	22	-	-	-	-	1	18.3	1	15
138	GILLETTE	2	7	2	9	2	7	2	9	-	-	-	-	-	-	-	-
139	GSKCONS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--
140	GLENMARK	-	-	-	-	-	-	--	-	1	12.6	1	11	-	-	-	-
141	GMRINFRA	-	-	-	-	-	-	-	-	-	-	-	-	1	12.9	2	9
142	GODFRYPHLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
143	GODREJCON	-	-	-	-	-	-	-	-	1	22.9	1	20	-	-	-	-
144	GODREJIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
145	GODREJPROP	-	-	-	-	-	-	-	-	1	23.6	1	17	-	-	-	-
146	GRAPHITE	-	-	-	-	-	-	-	-	-	-	-	-	1	20	1	16
147	GRASSIM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
148	GESHIPPING	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
149	GREAVESCOT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	GTLINFRA	3	8.9	3	9	2	10.1	2	27	1	33	1	27	-	-	-	-
151	GUJALKALI	-	-	-	-	-	-	-	-	1	19.1	1	14	1	30	1	14
152	FLUOROCHEM	-	-	-	-	-	-	-	-	-	-	-	-	2	15.4	2	10
153	GIPCL	-	-	-	-	-	-	-	-	-	-	-	-	1	30	1	17
154	GMDCLTD	-	-	-	-	-	-	-	-	-	-	-	-	1	27.1	1	49
155	GPPL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
156	GSFC	1	19.6	1	30	1	17.2	1	32	-	-	-	-	1	21	1	16
157	GULFOILLUB	-	-	-	-	-	-	-	-	2	12.6	2	44	-	-	-	-
158	HATHWAY	-	-	-	-	-	-	-	-	2	9.6	2	17	2	19.5	2	17
159	HAVELLS	-	-	-	-	--	-	-	-	2	10.9	2	20	2	12	2	13

[illegible]

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
187	INDIABULLS	-	-	-	-	-	-	-	-	2	9.6	2	11	3	9.1	3	15
188	INDIACEM	-	-	-	-	1	15.4	1	22	2	23	2	29	1	20.1	1	11
189	INDIANB	-	-	-	-	-	-	-	-	2	18.8	2	22	2	27	2	27
190	IHCL	-	-	-	-	-	-	-	-	-	-	-	-	2	22	2	10
191	IOB	-	-	-	-	2	15.9	2	14	-	-	--	-	2	26.2	2	30
192	IGL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
193	INDUSINDBK	2	0.5	3	-	-	-	-	-	2	10.1	2	15	2	8.9	2	38
194	NAUKRI	-	-	-	-	-	-	-	-	2	5.8	2	17	2	12.1	2	15
195	INFY	-	-	-	-	-	-	-	-	2	10.2	2	8	-	-	-	-
196	INGERRAND	1	20.7	1	14	-	-	-	-	-	-	-	-	2	14.7	2	18
197	INOXLEISUR	-	-	-	-	-	-	-	-	2	8.5	2	21	-	-	-	-
198	IOC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199	IPCALAB	-	-	-	-	1	7.2	1	10	2	27.8	2	22	-	-	-	-
200	IRB	2	12.4	2	22	2	12.4	2	22	2	6.2	2	22	2	28.5	2	23
201	ITC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	ITD	-	-	-	-	-	-	-	-	2	10.9	2	21	-	-	-	-
203	JAGRAN	-	-	-	-	-	-	-	-	-	-	-	-	2	12.8	2	29
204	JAICORPLTD	2	9.3	2	14	-	-	-	-	3	11	5	137	-	-	-	-
205	JISLDVREQS	-	-	-	-	-	-	-	-	-	-	-	-	3	14.6	3	31
206	JPOWER	-	-	-	-	-	-	-	-	-	-	-	-	2	12.5	2	21
207	J&KBANK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
208	JBCHEPHARM	1	19.5	1	15	1	20	1	12	2	8.7	2	13	2	18	2	10
209	JBFIN	2	7.3	2	13	-	-	-	-	2	15.3	2	11	1	23.5	1	23
210	JINDALSAW	1	21.2	1	24	1	19.2	1	18	-	-	-	-	1	19.1	1	11
211	JSL	-	-	-	-	-	-	-	-	2	7.3	2	4	2	9.7	2	14
212	JINDALSTEL	2	10.8	2	20	2	11	2	25	2	7.3	2	19	-	-	-	-
213	JKCEMENT	-	-	-	-	-	-	-	-	-	-	-	-	1	23.3	1	26

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
214	JKLAKSHMI	-	-	-	-	-	-	-	-	2	11.8	2	19	1	29	1	19
215	JKTYRE	-	-	-	-	-	-	-	-	-	-	-	-	3	19.7	3	14
216	JKIL	-	-	-	-	-	-	-	-	3	8.1	3	12	-	-	-	-
217	JMFINANCIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
218	JSWENERGY	2	15.8	2	45	-	-	-	-	2	23	2	35	2	22.3	2	14
219	JSWHL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	JSWSTEEL	-	-	-	-	-	-	-	-	2	5.2	2	23	2	10.4	2	3
221	JUBLFOOD	-	-	-	-	-	-	-	-	2	10.7	2	3	1	21.5	1	18
222	JUBILANTPHARMA	-	-	-	-	-	-	-	-	2	7.5	2	17	-	-	-	-
223	JUSTDIAL	-	-	-	-	-	-	-	-	-	-	-	-	1	19.1	1	21
224	JYOTHYLAB	-	-	-	-	-	-	-	-	-	-	-	-	1	24.3	1	13
225	JYOTISTRUC	2	8.6	2	13	1	18.4	1	25	-	-	-	-	-	-	-	-
226	KAJARIACER	-	-	-	-	-	-	-	-	-	-	-	-	3	7.4	3	8
227	KPIL	-	-	-	-	1	18.6	1	12	-	-	-	-	1	21.1	1	22
228	KANSAINER	1	10.2	1	17	-	-	-	-	-	-	-	-	1	19	1	27
229	KTKBANK	-	-	-	-	1	7.9	1	15	-	-	-	-	-	-	-	-
230	KARURVYSYA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
231	KSCL	1	16.6	1	13	-	-	-	-	-	-	-	-	1	20.5	1	13
232	KCP	2	9.1	2	9	-	-	-	-	-	-	-	-	-	-	-	-
233	KEC	-	-	-	-	-	-	-	-	3	10.2	3	11	-	-	-	-
234	KILPP	-	-	-	-	1	27.4	1	20	-	-	-	-	-	-	-	-
235	KKCL	2	10.3	2	5	-	-	-	-	-	-	-	-	1	24	1	19
236	KITEX	-	-	-	-	1	9.4	1	11	-	-	-	-	-	-	-	-
237	KNRCON	-	-	-	-	-	-	-	-	-	-	-	-	2	10.3	2	12
238	KOLTEPATIL	-	-	-	-	1	23	1	28	-	-	-	-	-	-	-	-
239	KOTAKBANK	2	3.8	2	19	2	3.8	2	19	2	7.2	2	13	-	-	-	-
240	KPITTECH	-	-	-	-	-	-	-	-	2	26.9	2	17	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
241	KPRMILL	-	-	-	-	-	-	-	-	-	-	-	-	3	8.9	3	10
242	KSB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
243	L&T	-	-	-	--	-	-	-	-	2	7.3	2	18	-	-	-	-
244	LMW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	LAOPALA	-	-	-	-	-	-	-	-	-	-	-	-	2	9.9	2	11
246	LGBBROSLTD	-	-	-	-	-	-	-	-	-	-	-	-	2	37	2	10
247	LICHSGFIN	-	-	-	-	-	--	-	-	2	8.5	2	17	-	-	-	-
248	LINDEINDIA	-	-	-	-	-	-	-	-	2	33	2	17	2	15	2	11
249	LTF	-	-	-	-	-	-	-	-	2	8	2	20	-	-	-	-
250	LTIM	-	-	-	-	-	-	-	-	2	17	2	12	2	12.7	2	12
251	LUPIN	-	-	-	-	-	-	-	-	2	10.3	2	18	-	-	-	-
252	M&M	-	-	-	-	-	-	-	-	-	-	-	-	2	30	2	34
253	M&MFIN	-	-	-	-	-	-	-	-	-	-	-	-	2	12.6	3	18
254	POONAWALLA	1	15	1	42	-	-	-	-	-	-	-	-	2	27.6	2	25
255	MAHSCOOTER	-	-	-	-	-	-	-	-	2	9.7	2	14	1	18.2	1	26
256	MAHSEAMLES	1	16.7	1	19	-	-	-	-	3	8.8	3	18	3	18.7	3	17
257	MHRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	MAHLIFE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	MANGCHEFER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	MRPL	2	9.9	2	11	-	-	-	-	-	-	-	-	2	21.2	2	16
261	MARICO	-	-	-	-	-	-	-	-	2	8.8	2	15	2	6.9	2	15
262	MARKSANS	-	-	-	-	-	-	-	-	2	11.8	2	19	-	-	-	-
263	MARUTI	-	-	-	-	-	-	-	-	2	6.4	2	16	-	-	-	-
264	MAXINDIA	-	-	-	-	-	-	-	-	-	-	-	-	2	10.1	2	19
265	MAYURUNIQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
266	MBLINFRA	2	17	2	10	1	9.3	1	37	-	-	-	-	2	11.2	2	15
267	MCDHOLDING	2	3	2	52	2	11	2	3	2	13.2	2	15	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
268	MCLEODRESS	-	-	-	-	-	-	-	-	2	9.8	2	13	-	-	-	-
269	MERCATOR	2	8.3	2	10	-	-	-	-	-	-	-	-	-	-	-	-
270	PGHL	1	15.1	1	11	1	16.9	1	11	-	-	-	-	-	-	-	-
271	MMTC	2	7	2	3	1	23.1	1	21	-	-	-	-	2	11.6	2	14
272	MOIL	2	6.8	2	12	-	-	-	-	2	14.8	2	28	2	17.5	2	10
273	MOTHERSON	-	-	-	-	2	2.1	2	19	-	-	-	-	-	-	-	-
274	MOTLALOFS	2	25.9	2	22	2	2.6	2	22	2	23.1	2	27	2	10.2	2	13
275	MPHASIS	2	15.6	2	17	2	14.3	2	17	-	-	-	-	-	-	-	-
276	MRF	-	-	-	-	2	10.9	2	20	2	6.9	2	28	-	-	-	-
277	MTEDUCARE	2	8.3	2	3	1	21.1	1	28	-	-	-	-	2	12.9	2	17
278	MUNJALSHOW	3	11.8	3	8	-	-	-	-	-	-	-	-	-	-	-	-
279	MUTHOOTFIN	2	20.9	2	30	2	19.9	2	29	2	13.2	2	21	2	11.1	2	11
280	NBCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
281	NATIONALUM	2	15.3	2	53	2	14.2	2	54	2	15.3	2	24	-	-	-	-
282	NAVA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
283	NAVNETEDUL	2	8.8	2	10	1	16.5	1	15	-	-	-	-	2	16	2	23
284	NCC	-	-	-	-	-	-	-	-	-	-	-	-	2	9	2	13
285	NDTV	2	8.3	2	15	1	17.4	1	30	-	-	-	-	-	-	-	-
286	NETWORK18	-	-	-	-	-	-	-	-	-	-	-	-	2	13.2	2	11
287	NCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
288	NHPC	2	12.2	2	22	2	19.6	2	21	-	-	-	-	-	-	-	-
289	NHPC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290	NIITLTD	2	9	2	3	1	22.5	1	13	2	10	2	9	2	9.8	2	10
291	NIITLTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
292	NMDC	-	-	-	-	2	5.9	2	20	2	9.5	2	22	-	-	-	-
293	NMDC	-	-	-	-	-	-	-	-	-	-	-	-	2	12.4	2	17
294	NOCIL	-	-	-	-	1	18.7	1	20	-	-	-	-	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
295	NOIDATOLL	-	-	-	-	-	-	-	-	-	-	-	-	2	23	2	9
296	NTPC	-	-	-	-	--	-	-	-	2	9.8	2	20	-	-	-	-
297	OBEROIRLTY	-	-	-	-	2	19.1	2	15	2	23.2	2	22	-	-	-	-
298	OILINDIA	-	-	-	-	-	-	-	-	2	13.1	2	17	-	-	-	-
299	OMAXE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	ONGC	-	-	-	-	2	2.7	2	18	-	-	-	-	2	11.6	2	16
301	OPTOCIRCUI	2	8.4	2	7	1	19.6	1	24	-	-	-	-	-	-	-	-
302	ORACLE	-	-	-	-	2	9.7	2	11	2	11.8	2	23	-	-	-	-
303	OSWALSEEDS	2	7.9	2	3	1	19.5	1	33	2	11.9	2	40	2	13.2	2	31
304	PAGEIND	-	-	-	-	2	4.5	2	25	2	11	2	17	-	-	-	-
305	PARSVNATH	-	-	-	-	-	-	-	-	2	13.2	2	21	2	11.7	2	17
306	PATELENG	2	14	2	10	1	25.1	1	22	2	8	2	3	3	17.9	3	11
307	PEL	-	-	-	-	2	7.2	2	38	2	13	2	23	2	7.7	2	10
308	PENINLAND	2	9.5	2	22	-	-	-	-	-	-	-	-	2	20.4	2	14
309	PENIND	-	-	-	-	1	19.8	1	28	2	5.6	2	21	-	-	-	-
310	PERSISTENT	-	-	-	-	-	-	-	-	2	20	2	18	2	11.6	2	3
311	PETRONET	2	7.2	2	24	2	7.4	2	24	-	-	-	-	2	24.2	2	15
312	PFC	-	-	-	-	2	3.5	2	27	2	9.6	2	11	2	14	2	8
313	PFIZER	2	16.7	2	21	2	13.4	2	13	-	-	-	-	-	-	-	-
314	PGHH	-	-	-	-	2	6	2	10	-	-	-	-	2	10	2	12
315	PHOENIX	2	16.7	2	17	2	17.6	2	12	2	14.9	2	12	-	-	-	-
316	PIDILITE	-	-	-	-	-	-	-	-	-	-	-	-	2	13	2	25
317	PIIND	2	11.4	2	17	2	11.1	2	12	2	11.1	2	16	-	-	-	-
318	PNB	-	-	-	-	-	-	-	-	2	10.7	2	60	3	15	3	14
319	POWERGRID	-	-	-	-	2	5.2	2	21	-	-	-	-	-	-	-	-
320	PRAJIND	2	6.1	2	10	-	-	-	-	-	-	-	-	2	17.7	2	20
321	PRAKASH	-	-	-	-	-	-	-	-	-	-	-	-	2	9.3	2	11

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
322	PRESTIGE	2	22.9	2	19	2	24	2	14	-	-	-	-	-	-	-	-
323	PRISMJOHNSN	2	8.1	2	8	1	19.7	1	17	2	7.1	2	13	-	-	-	-
324	PFS	-	-	-	-	1	9.1	1	29	-	-	-	-	-	-	-	-
325	PTC	-	-	-	-	-	-	-	-	-	-	-	-	2	16.6	2	31
326	PURVA	-	-	-	-	-	-	-	-	-	-	-	-	2	25	2	13
327	PVR	-	-	-	-	2	15.1	2	13	2	12.4	2	24	-	-	-	-
328	RADICO	-	-	-	-	2	25.7	2	25	2	26.3	2	16	-	-	-	-
329	RAJESHEXPO	-	-	-	-	1	16.9	1	30	-	-	-	-	-	-	-	-
330	RALLIS	-	-	-	-	-	-	-	-	-	-	-	-	1	28.1	1	20
331	RAMCOIND	2	9.6	2	12	1	25.9	1	23	2	6.3	2	16	3	16	3	13
332	RCF	1	31.5	1	42	-	-	-	-	-	-	-	-	-	-	-	-
333	RATNAMANI	-	-	-	-	-	-	-	-	-	-	-	-	1	27	1	25
334	RTNINDIA	2	7.3	2	28	1	8.5	1	23	-	-	-	-	-	-	-	-
335	RAYMOND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	REC	-	-	-	-	2	3.4	2	25	2	11.1	2	14	2	5.4	2	11
337	REDINGTON	-	-	-	-	-	-	-	-	-	-	-	-	2	17.6	2	11
338	RELIANCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	RELCAPITAL	-	-	-	-	1	4.6	1	14	2	15.8	2	13	-	-	-	-
340	RCOM	-	-	-	-	-	-	-	-	-	-	-	-	2	15.2	2	9
341	RELIANCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
342	RELINFRA	-	-	-	-	-	-	-	-	2	11.3	2	14	2	16.5	2	13
343	RPOWER	-	-	-	-	-	-	-	-	2	9.5	2	11	3	15.9	3	20
344	RELIGARE	-	-	-	-	-	-	-	-	-	-	-	-	3	15.8	3	15
345	REPCOHOME	2	12.4	2	3	-	-	-	-	3	9.3	3	17	2	13.4	2	13
346	ROLTA	-	-	-	-	-	-	-	-	2	15.1	2	15	2	16.9	2	16
347	SADBHAV	2	13.3	2	7	-	-	-	-	2	9.7	2	15	-	-	-	-
348	SAI	2	9.9	2	71	2	8.1	2	46	2	12.4	2	19	2	10	2	15

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
349	SANOFI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	SBI	-	-	-	-	-	-	-	-	2	8	2	33	-	-	-	-
351	SEINVEST	-	-	-	-	2	18.8	2	44	-	-	-	-	-	-	-	-
352	SHANTIGEAR	2	17.4	2	7	1	23.4	1	17	-	-	-	-	-	-	-	-
353	SCI	-	-	-	-	1	22.3	1	16	-	-	-	-	2	8.4	2	19
354	SHOPPERSTOP	-	-	-	-	-	-	-	-	-	-	-	-	3	11.3	3	13
355	SHREECEM	-	-	-	-	2	7.5	2	3	2	8	2	20	-	-	-	-
356	RENUKA	2	7.6	2	7	-	-	-	-	2	14.2	2	32	2	14	2	8
357	SRTRANS	-	-	-	-	-	-	-	-	-	-	-	-	2	18.4	2	22
358	SIEMENS	-	-	-	-	2	7.2	2	22	2	15.8	2	12	-	-	-	-
359	SIMPLEXINF	1	13.1	1	30	1	10.2	1	15	2	13.9	2	15	2	11.9	2	12
360	SKFINDIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
361	SOBHA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
362	JTEKT	2	7.3	2	8	-	-	-	-	-	-	-	-	-	-	-	-
363	SONATASOFTW	1	22.8	1	16	1	22	1	15	2	9.2	2	14	2	17.5	2	21
364	SOUTHBANK	2	6.5	2	19	-	-	-	-	-	-	-	-	2	13.4	2	8
365	SREINFRA	-	-	-	-	-	-	-	-	-	-	-	-	2	18	2	27
366	SRF	-	-	-	-	--	-	-	-	-	-	-	-	2	10.7	2	9
367	SRIRAMFIN	2	14.1	2	15	-	-	-	-	-	-	-	-	-	-	-	-
368	STLTECH	2	11.3	2	9	1	17.1	1	16	2	10.2	2	11	2	21	2	7
369	SUNDRMFAST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
370	SUNDARAMFIN	-	-	-	-	2	24.8	2	8	2	23	2	11	-	-	-	-
371	SUNPHARMA	2	3.1	2	21	-	-	-	-	2	13	2	26	-	-	-	-
372	SPARC	-	-	-	-	1	19.3	1	16	-	-	-	-	-	-	-	-
373	SUNTECH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
374	SUNTV	-	-	-	-	-	-	-	-	-	-	-	-	1	30	1	14
375	SUPREMEIND	-	-	-	-	2	13.6	2	9	-	-	-	-	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
376	SPLPETRO	1	19.7	1	24	-	-	-	-	2	9	2	17	-	-	-	-
377	SUVEN	-	-	-	-	1	18.4	1	14	-	-	-	-	-	-	-	-
378	SUZLON	2	8.4	2	26	2	10	2	15	-	-	-	-	-	-	-	-
379	SWANCORP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	SWARAJENG	-	-	-	-	-	-	-	-	-	-	-	-	3	13.1	3	28
381	TNPL	2	9	2	7	-	-	-	-	-	-	-	-	-	-	-	-
382	TATACHEM	-	-	-	-	-	-	-	-	-	-	-	-	3	17.9	3	11
383	TATACOFFEE	-	-	-	-	-	-	-	-	-	-	-	-	2	14.3	2	13
384	TATACOM	2	12.2	2	26	2	11.8	2	21	2	14.2	2	46	2	21	2	9
385	TATACONSUM	2	11	2	21	-	-	-	-	2	11.3	2	19	2	25.9	2	19
386	TATAELXSI	2	18	2	19	-	-	-	-	2	24.5	2	21	-	-	-	-
387	TATAINVEST	2	27.8	2	20	2	29.5	2	24	2	24.6	2	20	2	13.6	2	37
388	TATAMOTORS	2	6.2	2	61	-	-	-	-	2	13.6	2	24	-	-	-	-
389	TATAPOWER	2	9.8	2	56	2	7.8	2	17	2	12.6	2	34	2	8.4	2	4
390	TATASTLLP	-	-	-	-	-	-	-	-	-	-	-	-	2	6.5	2	13
391	TATASTEEL	-	-	-	-	-	-	-	-	2	8.5	2	21	-	-	-	-
392	TCS	-	-	-	-	-	-	-	-	2	2.5	2	13	-	-	-	-
393	TDPOWERSYS	1	15.6	1	33	-	-	-	-	2	10	2	23	2	14.6	2	9
394	TECHM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
395	ORISSAIND	2	9.3	2	13	1	22	1	13	2	9.3	2	3	-	-	-	-
396	RAMCOCEM	-	-	-	-	-	-	-	12	2	4.4	2	13	2	12.9	2	19
397	THERMAX	-	-	-	-	-	-	-	-	-	-	-	-	2	8.1	2	13
398	THOMASCOOK	2	10.4	2	3	1	8.2	1	13	2	12	2	17	2	14.2	2	19
399	TITAN	2	9.6	2	24	2	9.6	2	22	2	9.6	2	21	2	17.8	2	7
400	TORNTPHARM	2	8.7	2	22	2	9.6	2	14	--	-	-	-	-	-	-	-
401	TORNTPOWER	2	23.9	2	21	2	24.3	2	21	2	20.9	2	12	2	22.4	2	16
402	TREEHOUSE	-	-	-	-	1	10.7	1	40	-	-	-	-	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
403	TRENT	-	-	-	-	-	-	-	-	2	22.6	2	13	2	13	2	14
404	TBZ	2	11.3	2	7	-	-	-	-	-	-	-	-	-	-	-	-
405	TRIDENT	-	-	-	-	-	-	-	-	2	15	2	22	2	10.6	2	13
406	TTKPRESTIG	-	-	-	-	-	-	-	-	-	-	-	-	2	15	2	14
407	TV18BRDCST	-	-	-	-	1	12.5	1	20	2	5.5	2	3	-	-	-	-
408	TVSMOTOR	2	14.8	2	15	2	12.8	2	13	2	19.9	2	14	2	18.9	2	11
409	TVTODAY	-	-	-	-	-	-	-	-	-	-	-	-	1	23.5	1	26
410	UBL	2	13.6	2	20	2	13.6	2	22	-	-	-	-	-	-	-	-
411	UCOBANK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
412	UFLEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
413	ULTRACEMCO	2	6.9	2	20	2	4.9	2	15	2	10.4	2	15	2	25.9	2	21
414	UNICHEMLAB	-	-	-	-	1	16.8	1	15	-	-	-	-	-	-	-	-
415	UNIONBANK	-	-	-	-	-	-	-	-	2	15.6	2	41	-	-	-	-
416	UPL	-	-	-	-	-	-	-	-	-	-	-	-	2	18.6	2	30
417	USHAMART	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
418	UTTAMSTL	-	-	-	-	1	27.6	1	24	-	-	-	-	-	-	-	-
419	VAIBHAVGBL	-	-	-	-	2	84.4	2	17	-	-	-	-	-	-	-	-
420	VAKRANGEE	-	-	-	-	-	-	-	-	-	-	-	-	2	26.5	2	22
421	VTLLTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
422	WABAG	1	14.8	1	20	-	-	-	-	2	15.8	2	-	-	-	-	-
423	VEDL	2	6.1	2	29	-	-	-	-	2	7.4	2	2	26.5	2	22	2
424	VESUVIUS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425	VINATIORGA	-	-	-	-	1	15	1	11	-	-	-	2	20	2	14	2
426	VIPIND	-	-	-	-	1	19.3	1	15	-	-	-	-	-	-	-	-
427	VOLTAS	2	12.4	2	15	2	10.7	2	15	2	17	2	15	2	21	2	12
428	VSTIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
429	WABCO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sl. No	Symbols	2014-2022				White Swan				Grey Swan				Black Swan			
		Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration	Peak day	Peak rate	Diminishing day	Duration
430	WELCORP	1	20	1	28	1	21.9	1	17	-	-	-	-	3	18.7	3	18
431	WELSPUNLIV	-	-	-	-	-	-	-	-	-	-	-	-	2	17.6	2	15
432	WHEELS	2	12	2	3	-	-	-	-	-	-	-	-	-	-	-	-
433	WHIRLPOOL	-	-	-	-	-	-	-	-	-	-	-	-	3	11.1	3	12
434	WIPRO	-	-	-	-	-	-	-	-	2	16.2	2	26	2	17.4	2	37
435	WOCKPHARMA	1	17.1	1	16	1	14.1	1	14	-	-	-	-	1	27.5	1	17
436	YESBANK	-	-	-	-	-	-	-	-	2	2.3	2	25	-	-	-	-
437	ZEEL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
438	ZENSARTECH	-	-	-	-	-	-	-	-	-	-	-	1	26.6	1	18	1
439	ZYDUSLIFE	-	-	-	-	-	-	-	-	-	-	-	2	23.7	2	22	2
440	ZYDUSWELL	-	-	-	-	-	-	-	-	2	16.6	2	1	22.4	1	21	1
	Average	1.11	14	1.67	22	1.42	15.73	1.42	20.05	1.84	13.73	1.87	19.57	1.84	18.2	1.979	17

Source: Computed data

Appendix IV

VAR Results of OC and DE in Large-Cap Stocks Over White swan, Grey Swan and Black Swan Phases

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
3MINDIA	1	1.276	1.157	3.309	1.310	-1.556	-1.061	4.278	2.165	-0.678	-0.298	3.127	1.136
	2	-1.361	-1.239	6.721	2.668	-2.130	-1.498	3.300	1.665	-4.285	-1.941	5.256	1.943
ABB	1	1.066	1.031	9.525	4.568	0.559	0.425	3.467	1.879	3.524	1.466	-0.908	-0.459
	2	-1.925	-1.888	4.325	2.071	-0.190	-0.150	3.310	1.799	5.514	2.299	1.626	0.875
ACC	1	-1.529	-1.644	5.204	3.051	5.280	3.102	-1.256	-0.994	4.750	2.318	-2.474	-1.483
	2	-1.509	-1.631	3.883	2.301	2.333	1.395	-0.523	-0.416	1.459	0.734	0.035	0.020
ADANIENT	1	0.243	1.200	4.572	3.485	1.243	0.818	1.897	2.556	-1.381	-0.699	3.142	2.734
	2	0.203	1.005	2.155	1.638	3.114	2.078	-0.931	-1.298	2.205	1.119	-0.101	-0.090
	3	0.310	1.534	1.779	1.359	1.480	1.617	2.613	2.182				
ADANIPTS	1	-0.915	-1.455	4.938	3.061	-1.952	-2.160	2.698	1.686	2.140	1.366	1.547	1.010
	2	-0.486	-0.775	2.528	1.565	-0.729	-1.077	6.241	3.921	-0.508	-0.228	0.499	0.459
AIAENG	1	1.050	0.876	9.358	3.609	0.523	0.217	0.787	0.476	-0.480	-0.175	1.178	0.614
	2	-2.487	-2.077	0.731	0.280	2.608	1.094	-3.395	-2.052	0.436	0.160	-0.620	-0.321
ALSTOM	1	0.669	0.529	5.393	2.037	6.703	3.119	1.408	1.267	1.617	0.896	9.011	2.956
	2	-1.073	-0.851	3.666	1.376	9.267	4.350	-0.596	-0.534	-0.323	-0.177	12.419	4.190
	3	1.058	0.844	4.884	1.845	5.488	1.610	1.073	0.559				
ALSTOMTD	1	0.383	0.372	5.199	1.944	2.229	0.644	1.555	0.844	5.488	1.610	1.073	0.559
	2	-2.307	-2.267	4.160	1.551	6.757	2.922	4.339	2.561	2.229	0.644	1.555	0.844
APARIND	1	0.851	0.827	6.041	2.302	0.355	0.144	-0.139	-0.093	6.757	2.922	4.339	2.561
	2	-1.181	-1.175	7.422	2.800	3.781	2.613	0.499	0.431	0.355	0.144	-0.139	-0.093
APOLLOHOSP	1	-0.287	-0.358	2.428	1.382	2.948	1.734	1.207	1.240	3.781	2.613	0.499	0.431
	2	-2.554	-3.200	4.208	2.397	0.803	0.505	2.539	2.444	2.948	1.734	1.207	1.240
APOLLOTYRE	1	0.944	1.906	1.206	0.933	-0.378	-0.240	1.327	1.292	2.961	2.771	1.129	0.710
	2	-0.056	-0.114	1.618	1.255	0.716	0.466	2.325	2.225	0.859	0.842	1.117	0.717

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
AARTIIND	1	1.364	2.009	5.012	2.334	5.993	3.974	-0.592	-0.578	2.009	1.650	7.354	4.368
	2	-1.619	-2.397	2.463	1.148	7.354	4.368	2.009	1.650	-0.423	-0.355	4.425	2.541
ASHOK	1	-1.017	-1.371	5.436	3.143	4.425	2.541	-0.423	-0.355	0.634	0.969	4.099	3.405
	2	0.536	0.865	9.147	4.433	4.099	3.405	0.634	0.969	0.611	1.115	2.356	1.637
ASIANPAINT	1	0.433	0.561	2.259	1.645	2.356	1.637	0.611	1.115	0.014	0.259	-0.002	-0.787
	2	-1.202	-1.565	2.837	2.073	0.014	0.259	-0.002	-0.787	0.096	1.699	0.002	0.825
ASTRAZENCA	1	2.899	2.869	1.833	0.810	0.096	1.699	0.002	0.825	1.120	0.735	2.194	0.843
	2	-2.299	-2.357	4.381	1.939	1.185	1.078	2.368	1.264	-3.161	-2.151	8.06	3.172
ASTRAL	1	0.174	0.202	4.864	1.734	-2.750	-2.616	8.677	4.777	1.814	1.157	2.724	1.036
	2	1.458	1.689	0.669	0.238	-0.295	-0.271	4.082	1.751	-3.528	-2.295	7.275	2.797
ATUL	1	3.736	3.298	4.915	1.885	-1.948	-1.800	6.113	2.636	-0.100	-0.048	1.629	0.562
	2	0.156	0.139	2.768	1.057	0.475	0.337	2.491	1.160	0.024	0.011	3.640	1.211
AUROBINDO	1	-0.280	-0.716	4.025	3.077	-1.216	-0.866	5.835	2.674	1.254	1.448	3.184	1.843
	2	-0.392	-1.005	3.989	3.084	0.606	0.889	6.268	4.640	-0.148	-0.175	5.704	3.347
AXIS	1	-0.115	-0.473	0.775	0.591	-0.303	-0.449	5.782	4.306	0.853	0.994	-0.117	-0.061
	2	-0.289	-1.192	-0.095	-0.072	0.820	1.121	1.330	0.868	-0.805	-0.938	4.043	2.251
BAJAJ-AUTO	1	-0.160	-0.172	2.407	1.544	0.446	0.607	1.527	1.021	-2.679	-1.623	5.567	2.702
	2	0.504	0.545	1.868	1.198	-1.695	-1.446	5.606	3.618	-1.825	-1.117	4.013	1.959
BAJFINANCE	1	-0.074	-0.314	2.759	1.550	-1.497	-1.290	4.106	2.671	1.067	0.568	0.403	0.460
	2	0.007	0.031	-1.293	-0.734	0.342	0.475	1.885	1.246	1.136	0.608	-0.056	-0.064
BAJAJFINSV	1	-0.894	-0.890	2.519	1.148	-0.368	-0.517	2.337	1.573	0.420	0.214	0.711	0.688
	2	-3.769	-3.798	5.208	2.398	1.089	1.420	0.372	0.253	1.410	0.729	0.691	0.672
BAJAJHLDNG	1	3.421	2.170	2.602	0.899	-0.008	-0.010	2.639	1.846	1.605	0.950	-2.991	-1.042
	2	-1.244	-0.794	-0.139	-0.047	1.236	0.920	-0.248	-0.112	-0.308	-0.196	2.611	0.943
BANKBARODA	1	-0.218	-1.004	2.013	1.584	-1.206	-0.930	4.446	2.037	0.773	0.884	2.588	1.722
	2	0.065	0.300	1.145	0.902	1.443	2.422	1.817	1.476	2.255	2.589	0.516	0.348

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
BERGEPAIN	1	0.571	0.895	3.960	2.010	0.269	0.456	2.399	1.982	2.985	2.120	0.001	0.001
	2	-1.852	-2.929	2.451	1.244	3.113	2.522	1.475	0.928	0.141	0.099	1.303	0.779
BEL	1	-0.348	-1.686	2.368	1.399	0.133	0.108	1.673	1.066	-0.380	1.059	3.485	1.855
	2	-0.147	-0.712	1.462	0.868	0.823	0.982	3.375	2.193	0.912	1.045	2.980	1.801
BHARATFORG	1	0.141	0.307	1.694	1.136	-0.713	-0.882	5.032	3.376	0.531	0.459	0.742	0.347
	2	-0.420	-0.914	3.339	2.254	0.187	0.210	2.109	1.241	-0.297	-0.261	2.832	1.332
BHEL	1	0.139	0.291	3.932	2.680	-0.127	-0.144	3.642	2.159	2.112	1.021	-0.288	-0.279
	2	-0.178	-0.377	2.635	1.809	0.683	1.190	3.944	3.052	0.145	0.072	1.175	1.138
BPCL	1	-0.379	-0.918	2.504	1.692	-1.119	-2.014	5.544	4.401	-0.373	-0.351	1.626	0.873
	2	-0.371	-0.900	1.558	1.059	0.065	0.076	2.900	1.916	0.302	0.292	2.041	1.131
AIRTELPP	1	0.661	0.951	0.083	0.053	0.153	0.179	1.417	0.955	0.080	0.061	1.455	0.754
	2	0.017	0.025	2.605	1.686	0.370	0.355	3.166	2.010	-1.740	-1.326	3.466	1.809
INDUSTOWER	1	-1.746	-2.260	-1.156	-0.567	-2.669	-2.606	5.137	3.334	-0.290	-0.398	3.131	1.943
	2	-0.452	-0.593	4.414	2.141	0.217	0.339	2.469	1.694	0.756	1.047	2.617	1.619
BIOCON	1	0.316	0.967	3.292	2.168	0.612	0.965	2.598	1.744	0.672	0.582	1.317	0.906
	2	-0.141	-0.436	3.925	2.582	1.493	1.775	-0.361	-0.288	-0.252	-0.218	3.354	2.320
BOSCH	1	1.353	1.564	1.354	0.791	0.362	0.430	3.389	2.690	-1.057	-0.761	5.353	2.446
	2	-0.112	-0.131	-2.093	-1.226	0.499	0.457	4.033	2.263	-2.313	-1.708	6.546	3.023
BRITANNIA	1	-1.795	-3.120	3.884	2.404	-1.558	-1.465	6.372	3.643	-0.974	-0.600	3.971	1.985
	2	-0.826	-1.431	2.045	1.263	-0.984	-0.781	4.801	3.131	-1.005	-0.628	3.105	1.556
CANARA	1	-0.401	-0.920	3.903	2.926	-1.651	-1.316	3.611	2.352	0.050	1.070	0.001	0.493
	2	-1.221	-2.861	3.348	2.542	1.257	1.745	1.885	1.229	-0.047	-1.014	0.000	0.106
CHOLAFIN	1	-0.182	-0.377	2.686	0.995	0.370	0.522	2.760	1.816	0.609	0.689	1.710	0.758
	2	-0.601	-1.244	-0.852	-0.317	0.705	0.970	2.034	1.112	-1.112	-1.263	3.767	1.677
CIPLA	1	-1.786	-2.324	3.998	2.816	-1.639	-2.277	5.168	2.860	-1.103	-0.838	6.237	3.805
	2	-2.093	-2.716	5.070	3.580	-0.399	-0.402	4.863	3.712	-2.782	-2.204	6.535	4.117

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
COALINDIA	1	-2.127	-2.619	3.006	1.863	-2.342	-2.442	5.536	4.385	-0.120	-0.112	2.492	1.620
	2	-2.886	-3.560	5.981	3.734	-0.011	-0.008	4.234	3.030	0.393	0.364	0.959	0.652
COLGATE	1	-0.184	-0.282	3.215	1.851	-3.926	-2.956	2.955	2.158	0.003	0.002	3.656	2.057
	2	-1.225	-1.896	2.184	1.253	-0.011	-0.008	4.234	3.030	-4.235	-2.491	3.855	2.210
CONCOR	1	-1.411	-2.040	5.225	2.358	-3.926	-2.956	2.955	2.158	-2.055	-1.699	7.355	3.496
	2	-2.555	-3.698	2.132	0.964	-2.305	-2.443	9.251	5.512	-0.682	-0.567	3.819	1.957
COROMANDEL	1	-0.586	-0.534	11.582	4.612	-0.934	-0.996	4.479	2.710	0.395	0.203	-1.307	-0.530
	2	-2.456	-2.243	7.833	3.106	0.549	0.413	0.630	0.342	-4.070	-2.119	6.282	2.592
CRISIL	1	-0.602	-0.444	8.557	3.327	-3.239	-2.459	8.843	4.843	-0.319	-0.165	0.652	0.257
	2	0.270	0.201	0.078	0.030	0.049	0.037	2.891	1.424	-3.128	-1.621	4.027	1.589
CUMMINS	1	-0.682	-0.663	8.233	3.819	-1.601	-1.211	3.381	1.663	0.791	0.553	3.886	2.010
	2	-2.882	-2.804	4.589	2.129	1.137	1.087	4.751	2.964	0.340	0.239	0.315	0.162
DABURE	1	1.206	1.179	2.284	1.298	-0.637	-0.615	1.771	1.103	-2.250	-1.347	2.907	1.667
	2	-2.017	-1.979	2.231	1.278	-1.197	-0.892	4.236	2.889	-5.069	-3.037	5.732	3.314
DIVIS	1	-0.227	0.511	3.750	1.631	-3.192	-2.374	4.048	2.751	3.042	1.979	0.164	0.090
	2	-0.302	0.509	3.779	1.629	1.316	1.235	3.718	2.631	-0.640	-0.431	4.004	2.182
DLF	1	-0.158	-0.434	3.364	2.583	-0.631	-0.598	4.368	3.077	-0.291	-0.294	2.221	1.251
	2	-0.392	-1.084	3.362	2.602	0.164	0.228	1.706	1.153	0.476	0.488	0.981	0.552
DRREDDY	1	-1.232	-1.820	2.155	1.578	-0.137	-0.192	2.411	1.636	-0.742	-0.478	3.889	2.336
	2	-0.572	-0.846	4.614	3.369	-1.002	-0.996	5.307	4.113	-1.228	-0.835	3.931	2.355
EICHERMOT	1	-0.985	-1.386	2.029	1.204	-0.119	-0.119	3.755	2.936	-0.401	-1.925	2.390	1.614
	2	-2.604	-3.673	4.778	2.850	-0.331	-1.688	2.706	2.116	0.340	1.809	2.540	1.701
ESCORTS	1	-0.169	-0.273	7.966	4.583	0.251	1.323	1.733	1.347	0.920	0.770	-0.012	-0.006
	2	-2.060	-3.550	7.705	4.513	0.238	0.275	1.629	1.080	-1.270	-1.146	3.891	1.927
EXIDE	1	-0.155	-0.195	6.253	3.727	-1.838	-2.190	4.806	3.257	-1.677	-0.982	4.530	2.165
	2	-0.175	-0.220	3.380	2.004	-0.664	-0.553	4.777	3.007	-2.960	-1.774	4.061	1.927

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
SCHAEFFLER	1	-1.919	-0.906	6.057	1.650	-2.591	-2.181	4.635	2.956	4.253	1.144	0.836	0.224
	2	-3.032	-1.438	1.715	0.465	-0.464	-0.894	4.274	1.690	1.828	0.485	3.232	0.860
FEDERALBNK	1	0.563	1.182	3.556	2.249	-0.510	-0.984	2.209	0.882	-0.725	-0.615	5.558	2.431
	2	-0.721	-1.515	1.890	1.193	1.007	1.206	3.245	1.941	-0.103	-0.093	3.336	1.555
	3	-1.113	-2.347	0.772	0.491	-0.731	-0.911	3.755	2.345				
FSL	1	1.285	2.498	4.726	3.138	0.271	0.351	5.879	3.641	1.063	0.760	3.638	1.583
	2	-1.874	-3.785	5.967	3.980	-2.152	-2.928	5.493	3.504	-2.057	-1.573	4.933	2.247
FORTIS	1	-0.731	-1.004	5.025	2.510	0.649	0.547	4.898	2.827	1.485	0.674	3.684	1.500
	2	-3.191	-4.523	3.030	1.524	-1.463	-1.288	5.725	3.354	-0.454	-0.210	5.183	2.105
GAIL	1	-0.150	-0.312	0.651	0.401	0.104	0.128	4.901	3.525	-0.547	-0.536	3.564	2.253
	2	-1.054	-2.196	1.896	1.172	-0.253	-0.308	3.632	2.673	0.763	0.742	1.265	0.821
GILLETTE	1	5.423	3.804	4.103	1.877	3.539	1.415	3.021	1.469	4.807	1.261	0.380	0.129
	2	1.106	0.776	1.114	0.509	0.604	0.241	2.291	1.125	-0.885	-0.230	2.748	0.952
GSKCONS	1	0.803	1.304	1.011	0.624	1.572	1.064	3.956	2.150	-0.504	-0.235	3.814	1.583
	2	-0.601	-0.978	1.159	0.717	-1.624	-1.100	4.154	2.241	-1.344	-0.630	2.683	1.089
GLENMARK	1	-0.175	-0.263	2.939	1.883	1.095	1.485	6.074	4.313	1.594	1.650	4.051	2.210
	2	-0.516	-0.771	2.583	1.670	-1.613	-2.247	6.350	4.585	-1.102	-1.179	5.919	3.252
GMRINFRA	1	-0.204	-0.421	3.566	2.157	2.586	3.174	-0.454	-0.301	3.945	3.165	-2.736	-1.449
	2	-0.749	-1.574	5.510	3.428	-0.836	-1.086	3.6611	2.475	-1.420	-1.181	2.381	1.260
GODFRYPHLP	1	0.313	0.869	7.168	3.360	0.955	0.718	4.743	2.351	0.673	0.386	3.449	1.402
	2	-0.747	-2.078	1.308	0.612	-1.899	-1.504	6.124	3.108	-2.537	-1.579	5.495	2.312
GODREJCON	1	-0.290	-0.474	3.429	1.691	1.151	1.169	1.336	0.906	1.176	0.903	-2.246	-1.294
	2	-1.465	-2.398	-0.886	-0.436	-1.070	-1.090	3.023	2.068	-3.306	-2.561	1.347	0.781
GODREJPROP	1	0.408	0.465	8.179	3.839	-2.016	-2.075	5.388	2.616	-0.590	-0.385	4.293	1.492
	2	-2.233	-2.590	1.503	0.703	-0.469	-0.490	2.037	0.986	-1.244	-0.840	3.076	1.067
GRASSIM	1	-0.253	-0.789	3.037	1.788	0.335	0.296	1.712	0.950	-0.535	-0.401	2.408	1.172
	2	0.219	0.685	-0.068	-0.040	-2.111	-1.899	2.782	1.540	-1.110	-0.847	0.998	0.481

CXXX

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
HDFCBANK	1	-1.047	-1.731	-0.802	-0.544	1.282	1.193	0.325	0.212	2.142	1.612	-1.422	-0.767
	2	-1.293	-2.129	-1.165	-0.792	-0.861	-0.798	2.402	1.569	-1.222	-0.910	3.479	1.862
HAVELLS	1	-0.691	-2.007	2.865	1.603	6.001	5.210	-4.437	-2.565	6.771	3.817	-3.130	-1.451
	2	-0.942	-2.740	1.077	0.607	1.989	1.695	-1.669	-0.957	-0.561	-0.308	1.153	0.535
HCLTECH	1	-0.466	-1.085	-3.809	-2.452	2.949	2.636	-1.996	-1.248	4.384	2.822	-2.242	-1.076
	2	-0.119	-0.278	-0.052	-0.033	0.213	0.189	0.228	0.144	1.308	0.833	-0.877	-0.424
HEROMOTO	1	0.727	0.767	0.771	0.437	5.062	4.790	-3.425	-2.102	5.076	4.136	-2.102	-1.127
	2	-3.194	-3.370	3.165	1.801	-2.041	-1.891	3.474	2.163	-1.627	-1.283	2.006	1.097
HINDALCO	1	3.546	6.200	-6.734	-4.265	-11.13	-6.800	7.522	9.646	6.798	5.930	-9.025	-4.086
	2	-0.548	-0.946	2.110	1.330	2.971	1.734	-0.740	-0.872	0.617	0.502	1.257	0.549
HINDPETRO	1	0.550	1.579	-3.727	-2.286	5.233	6.250	-4.879	-3.223	5.063	4.628	-4.520	-2.372
	2	-0.596	-1.709	1.748	1.069	-0.679	-0.778	-0.437	-0.296	-0.823	-0.707	-0.572	-0.310
HUL	1	4.404	4.441	-4.228	-2.777	2.425	1.981	-3.140	-2.142	3.922	2.109	-1.839	-0.883
	2	0.291	0.292	-1.038	-0.679	-1.170	-0.956	0.347	0.240	-1.638	-0.905	2.550	1.217
HINDZINC	1	4.641	5.483	-3.866	-2.021	8.024	7.930	-3.508	-1.968	7.357	5.068	-2.096	-0.961
	2	3.243	3.800	-0.940	-0.492	2.280	2.152	1.004	0.557	0.666	0.440	0.603	0.271
HONAUT	1	6.707	4.604	-1.589	-0.578	5.818	4.247	-6.208	-2.689	4.244	2.274	-1.854	-0.595
	2	3.027	2.096	-2.841	-1.027	2.386	1.718	0.237	0.102	2.746	1.457	1.059	0.340
ICICI	1	-0.058	-0.218	-1.695	-1.176	5.818	4.247	-6.208	-2.689	2.503	1.992	-2.182	-0.940
	2	-0.120	-0.452	-1.521	-1.060	2.386	1.718	0.237	0.102	-0.817	-0.649	0.904	0.397
IDBI	1	7.274	14.13	-15.63	-9.116	5.293	5.807	-7.954	-4.734	8.553	6.819	-5.941	-2.253
	2	-0.171	-0.311	3.044	1.722	0.088	0.094	-0.583	-0.345	3.104	2.252	-3.573	-1.401
IDFC	1	2.092	0.518	-4.679	1.889	8.881	11.009	-8.683	-4.355	5.689	5.449	-1.593	-0.702
	2	-0.129	0.521	3.556	1.894	0.582	0.659	-1.298	-0.660	1.419	1.300	-3.472	-1.627
INDIANB	1	6.338	9.768	-4.876	-2.241	8.263	10.839	-6.340	-3.494	11.528	9.650	-8.486	-3.949
	2	-0.905	-1.355	1.682	0.771	0.884	1.061	-2.298	-1.296	2.162	1.550	-1.042	-0.473

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
IHCL	1	8.338	8.189	1.008	0.430	9.506	9.035	-11.96	-5.504	10.14	6.273	-11.08	-3.692
	2	1.216	1.172	-2.532	-1.079	0.501	0.446	2.443	1.084	1.826	1.049	2.001	0.6426
IOC	1	1.382	3.032	-3.370	-1.898	6.342	5.748	-4.743	-3.096	5.232	3.235	-3.546	-1.809
	2	-0.386	-0.845	0.543	0.307	-2.314	-2.030	1.870	1.228	-3.387	-2.047	1.460	0.755
INDUSINDBK	1	3.874	4.089	-5.234	-2.802	1.728	2.762	-1.263	-0.713	1.669	2.597	-0.100	-0.052
	2	-2.804	-2.959	2.182	1.168	0.642	1.021	-1.888	-1.078	1.005	1.572	-2.672	-1.403
NAUKRI	1	8.682	7.327	-7.574	-2.486	4.236	4.680	-2.761	-1.557	4.845	3.719	-2.828	-1.291
	2	1.625	1.355	2.669	0.870	-0.415	-0.446	1.102	0.621	0.666	0.493	-0.338	-0.153
INFY	1	-0.713	-1.905	-3.113	-2.025	5.051	4.598	-4.272	-2.878	5.402	3.771	-2.948	-1.520
	2	-0.049	-0.131	0.591	0.384	0.423	0.379	1.804	1.206	0.601	0.412	1.668	0.843
IRB	1	5.388	8.590	-8.503	-4.397	9.005	12.15	-6.249	-3.358	9.002	8.777	-6.424	-2.817
	2	0.091	0.142	-1.238	-0.635	1.517	1.875	-1.603	-0.870	2.116	1.856	-2.425	-1.060
ITC	1	0.110	0.148	-1.466	-0.942	5.515	5.480	-5.791	-4.146	2.835	2.228	-1.392	-0.829
	2	-0.658	-0.884	-0.255	-0.163	0.008	0.008	0.890	0.627	-1.382	-1.084	0.742	0.436
JINDALSTEL	1	3.799	8.577	-8.779	-5.036	3.367	5.090	-4.984	-3.055	3.712	4.139	-4.948	-2.343
	2	-0.158	-0.348	0.714	0.407	-0.800	-1.169	1.188	0.720	0.194	0.203	-1.851	-0.868
JSWENERGY	1	7.307	10.359	-15.145	-7.214	8.927	9.329	-4.329	-2.237	10.10	6.234	-3.731	-1.472
	2	0.502	0.687	2.792	1.298	0.619	0.604	4.114	2.112	1.981	1.147	4.442	1.733
JSWSTEEL	1	-0.221	-1.175	-2.608	-1.855	3.614	4.392	-4.639	-2.989	4.890	4.072	-7.213	-3.529
	2	-0.649	-3.454	2.198	1.564	0.817	0.974	-2.504	-1.614	1.026	0.828	-1.292	-0.611
JUBLFOOD	1	2.136	3.814	-3.095	-1.633	4.474	4.833	-1.515	-0.905	5.087	3.693	-3.651	-1.639
	2	-1.332	-2.369	0.136	0.072	-2.000	-2.108	0.859	0.520	-2.989	-2.060	2.039	0.939
KOTAKBANK	1	1.613	2.404	-2.394	-1.300	4.946	4.343	-4.191	-2.274	4.538	3.124	-2.203	-0.954
	2	0.643	0.957	-1.344	-0.730	-0.694	-0.604	0.660	0.361	-1.507	-1.033	2.742	1.192
KPITTECH	1	2.693	4.421	-3.350	-1.622	8.357	11.43	-6.669	-3.410	12.184	10.26	-10.74	-4.109
	2	-1.277	-2.099	5.160	2.495	0.850	1.056	-0.6249	-0.321	2.766	1.982	-5.641	-2.1421

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
LTF	1	7.288	9.222	-12.88	-6.412	5.333	6.826	-8.92	-5.022	5.199	5.099	-6.152	-2.837
	2	0.343	0.423	2.888	1.421	2.165	2.674	-3.420	-1.893	2.070	1.928	-3.006	-1.367
L&T	1	3.583	5.181	-4.730	-3.097	8.759	7.054	-10.10	-5.649	5.859	3.921	-5.220	-2.505
	2	-0.550	-0.788	0.484	0.314	0.274	0.217	0.903	0.499	1.489	1.002	-0.151	-0.074
LICHSGFIN	1	1.937	2.459	-1.903	-1.038	4.932	5.421	-6.172	-3.243	3.681	3.112	-2.756	-1.160
	2	-0.186	-0.237	1.035	0.568	-0.954	-1.025	1.938	1.013	-1.250	-1.037	3.097	1.309
LINDEINDIA	1	13.87	12.24	-8.562	-2.792	15.52	13.51	-11.91	-5.463	18.07	9.212	-12.29	-3.892
	2	1.902	1.606	0.952	0.311	5.530	4.259	-2.234	-0.999	3.254	1.440	0.088	0.027
LTIM	1	0.473	0.981	-5.006	-2.603	8.070	8.123	-5.724	-3.126	6.169	4.206	-2.890	-1.223
	2	-0.076	-0.159	1.767	0.919	0.613	0.580	0.573	0.312	-0.267	-0.173	0.788	0.337
LUPIN	1	-0.994	-1.173	-1.514	-0.862	5.270	5.257	-2.716	-1.756	6.609	5.209	0.665	0.386
	2	-1.465	-1.733	-0.311	-0.178	-1.780	-1.736	3.036	1.988	-0.275	-0.209	4.710	2.781
M&MFIN	1	5.144	7.079	-9.725	-4.931	1.713	2.400	-0.898	-0.468	1.706	2.068	2.121	0.934
	2	-1.290	-1.744	3.716	1.873	-0.237	-0.335	3.150	1.6664	0.228	0.281	2.000	0.901
M&M	1	0.227	0.401	0.178	0.106	6.603	7.083	-5.484	-3.377	5.198	4.312	-2.574	-1.267
	2	-0.377	-0.669	0.888	0.534	-1.119	-1.167	0.126	0.077	-0.949	-0.784	-0.003	-0.001
MARICO	1	2.048	2.843	-0.431	-0.206	7.304	5.343	-5.346	-3.379	2.489	1.559	-1.022	-0.621
	2	0.810	1.125	-0.861	-0.414	2.722	1.933	-1.122	-0.702	2.628	1.636	-1.515	-0.915
MARUTI	1	4.013	4.304	-4.514	-2.676	5.848	6.152	-7.535	-4.786	4.418	3.963	-4.455	-2.485
	2	-2.443	-2.606	3.811	2.252	-1.303	-1.331	1.613	1.015	0.092	0.080	-0.155	-0.085
MOTHERSON	1	1.286	2.318	-4.928	-2.583	-2.992	-1.583	0.050	0.064	2.866	2.850	-0.683	-0.290
	2	-0.355	-0.641	0.807	0.423	0.148	3.678	-0.178	-0.094	0.159	0.155	0.465	0.198
MOTILALOFS	1	10.323	10.742	-1.184	-0.418	8.290	8.112	2.458	1.266	5.653	4.155	1.737	0.778
	2	-1.449	-1.465	-0.415	-0.146	2.503	2.337	-0.939	-0.481	3.376	2.438	-0.529	-0.237
MPHASIS	1	8.021	7.490	-4.021	-1.735	6.363	5.048	0.592	0.2750	5.277	2.642	2.610	0.879
	2	1.731	1.598	0.432	0.187	2.301	1.7891	-3.445	-1.615	3.503	1.750	-5.188	-1.789

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
MRF	1	9.102	9.778	-9.407	-5.165	7.959	6.097	-7.975	-4.787	9.397	5.237	-7.234	-3.461
	2	0.548	0.570	0.012	0.006	-0.523	-0.393	2.145	1.275	-1.882	-1.014	3.790	1.765
MUTHOOTFIN	1	9.585	9.822	-4.763	-1.852	8.050	7.972	-9.621	-4.987	5.491	4.385	-5.404	-2.228
	2	0.407	0.405	1.196	0.464	1.633	1.535	-1.287	-0.656	1.011	0.778	-0.646	-0.263
NATIONALUM	1	6.387	9.504	-5.450	-2.722	6.392	9.018	-6.621	-4.285	5.338	4.096	-3.838	-1.887
	2	0.781	1.136	2.795	1.393	-0.107	-0.143	3.223	2.057	-1.706	-1.273	5.123	2.469
NHPC	1	8.015	7.980	-9.810	-4.944	10.38	7.695	-8.709	-4.164	8.561	4.161	-7.756	-2.733
	2	1.067	1.047	1.413	0.706	1.174	0.831	3.076	1.465	-2.140	-1.003	5.114	1.791
NMDC	1	3.850	5.167	-7.512	-4.119	4.935	5.920	-6.120	-3.692	5.244	4.328	-6.304	-2.970
	2	0.954	1.269	1.270	0.691	0.147	0.171	1.6935	1.010	-0.486	-0.387	1.414	0.658
NTPC	1	1.454	1.364	-3.131	-1.602	6.950	5.989	-5.156	-3.143	2.117	1.282	-0.860	-0.406
	2	-1.050	-0.985	2.087	1.073	-1.022	-0.856	2.947	1.785	-1.640	-0.990	2.975	1.3977
OBEROIRLTY	1	8.412	8.651	-4.454	-1.609	8.997	8.874	-4.408	-2.190	8.126	5.614	-1.845	-0.790
	2	2.132	2.142	-1.842	-0.666	-0.269	-0.252	-1.752	-0.880	-0.276	-0.181	-0.291	-0.125
ONGC	1	2.048	2.999	-4.664	-2.763	5.979	7.217	-8.899	-5.345	4.795	4.247	-6.176	-2.919
	2	-0.326	-0.476	2.971	1.752	-1.223	-1.386	-0.911	-0.534	-2.037	-1.735	-0.159	-0.074
OILINDIA	1	0.101	0.132	-4.251	-2.135	5.481	5.358	-4.362	-2.114	2.780	1.946	0.280	0.105
	2	-0.055	-0.073	2.962	1.488	1.361	1.287	-2.747	-1.349	-0.066	-0.046	-0.863	-0.332
ORACLE	1	7.970	5.998	-7.444	-3.260	5.990	4.036	-1.973	-0.881	4.817	2.310	-0.453	-0.159
	2	1.691	1.255	0.670	0.294	2.342	1.554	-0.309	-0.137	1.299	0.612	0.610	0.211
PAGEIND	1	2.572	3.228	-2.913	-1.482	5.948	5.624	-2.396	-1.547	4.941	2.944	-1.288	-0.628
	2	0.562	0.706	0.478	0.242	-0.251	-0.231	1.060	0.687	0.884	0.516	0.262	0.128
PERSISTENT	1	0.961	1.406	3.065	1.349	9.730	8.592	-6.443	-3.366	9.343	1.806	-5.824	2.561
	2	0.208	0.304	0.386	0.168	1.286	1.071	1.896	0.989	3.341	1.916	0.337	2.583
PETRONET	1	2.975	4.833	-1.744	-0.943	3.001	2.357	-1.247	-0.722	4.193	2.756	0.097	0.049
	2	-0.015	-0.025	1.043	0.563	-3.850	-3.029	1.946	1.147	-4.131	-2.726	0.470	0.244

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
PFIZER	1	9.023	8.084	-3.804	-1.806	-6.106	-3.098	15.50	9.611	13.858	5.845	-4.649	-1.794
	2	2.751	2.418	-0.138	-0.065	0.710	0.363	4.192	2.419	0.391	0.155	3.229	1.243
PHOENIX	1	8.498	5.142	-1.726	-0.422	4.904	3.812	-5.619	-2.188	1.708	0.888	-2.037	-0.584
	2	-0.891	-0.535	6.751	1.643	1.273	0.979	-1.968	-0.76	0.213	0.110	-2.056	-0.588
PIIND	1	6.000	5.896	-4.439	-1.831	6.022	4.900	-3.483	-1.750	3.144	1.610	-0.875	-0.324
	2	1.303	1.270	3.293	1.351	-1.440	-1.161	3.594	1.794	1.175	0.605	1.229	0.453
PIDILITE	1	9.700	8.952	-5.951	-3.077	9.666	6.848	-7.460	-4.092	6.931	3.815	-4.354	-2.018
	2	2.008	1.812	-0.257	-0.133	0.547	0.368	0.336	0.186	-0.812	-0.428	1.062	0.502
PEL	1	3.759	4.488	-4.088	-1.862	5.139	6.980	-4.150	-2.522	3.410	4.141	-1.286	-0.733
	2	-0.702	-0.833	1.593	0.723	0.115	0.150	-1.248	-0.758	-0.256	-0.300	-1.161	-0.663
PFC	1	1.802	3.793	-5.761	-3.287	6.373	5.997	-6.857	-3.722	5.585	4.046	-4.670	-2.035
	2	-0.478	-1.000	1.226	0.698	-0.073	-0.067	-1.198	-0.643	-1.571	-1.103	1.265	0.546
POWERGRID	1	4.495	3.792	-2.444	-1.328	3.795	3.672	-3.892	-2.303	2.658	1.409	-3.723	-1.661
	2	0.594	0.499	0.535	0.291	0.121	0.116	-0.394	-0.232	1.891	1.003	-3.122	-1.405
PRESTIGE	1	9.356	10.040	-3.112	-1.072	7.117	8.764	-5.439	-2.768	4.596	4.579	-1.899	-0.806
	2	1.301	1.352	-0.935	-0.320	0.881	1.020	-1.201	-0.608	-0.423	-0.404	0.657	0.278
PGHH	1	5.293	2.657	-3.903	-1.313	7.934	3.724	-1.642	-0.714	9.397	3.074	-2.482	-0.884
	2	4.014	2.023	-3.855	-1.294	0.432	0.198	0.013	0.006	3.726	1.195	-0.195	-0.069
PNB	1	0.065	0.260	-0.740	-0.506	3.708	4.172	-0.220	-0.144	4.374	4.590	0.018	0.012
	2	-0.101	-0.400	3.285	2.243	0.353	0.387	1.136	0.754	1.494	1.501	0.869	0.576
PVR	1	8.785	8.301	-7.882	-3.199	5.08	6.318	-4.475	-2.600	4.833	4.958	-1.773	-0.885
	2	1.838	1.702	-0.447	-0.181	-1.358	-1.628	2.385	1.384	-1.449	-1.417	3.429	1.711
RADICO	1	10.57	16.286	-9.710	-4.657	12.64	13.45	-12.24	-6.656	12.364	9.181	-12.017	-5.342
	2	1.313	1.865	1.607	0.768	2.567	2.413	0.613	0.322	2.385	1.562	0.909	0.380
REC	1	1.696	3.569	-5.230	-3.069	7.296	7.298	-7.297	-4.416	5.622	4.508	-3.305	-1.716
	2	-0.355	-0.744	2.630	1.544	0.952	0.912	-0.575	-0.342	2.212	1.699	-1.569	-0.815

Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
RELIANCE	1	2.260	0.497	-6.181	1.404	6.167	5.736	-9.257	-4.712	3.360	2.781	-3.260	-1.674
	2	0.179	0.500	0.055	1.412	0.867	0.779	-3.289	-1.649	0.701	0.568	-2.339	-1.175
SHREECEM	1	4.483	3.735	-1.078	-0.440	6.382	5.012	-5.417	-2.932	6.371	3.417	-5.105	-2.091
	2	-2.311	-1.927	-0.330	-0.134	-0.371	-0.285	2.551	1.364	1.455	0.758	-0.206	-0.085
SRIRAMFIN	1	3.480	1.840	-2.766	-0.659	8.088	6.071	-3.636	-1.289	6.059	2.538	0.668	0.177
	2	-0.673	-0.357	4.426	1.049	-0.528	-0.386	-1.269	-0.455	-2.239	-0.929	3.398	0.931
SEIMENS	1	5.805	6.249	-6.887	-3.393	11.95	8.206	-8.981	-4.394	9.947	5.415	-6.956	-3.042
	2	0.309	0.328	1.100	0.540	5.139	3.353	-1.291	-0.628	5.073	2.630	-3.012	-1.300
SRF	1	11.152	14.332	-14.551	-7.055	-0.189	-0.581	0.559	0.340	9.971	6.098	-9.708	-4.122
	2	0.248	0.298	2.621	1.251	0.215	0.661	1.005	0.614	4.227	2.425	-0.816	-0.335
SUNDARAMFIN	1	14.82	10.035	0.034	0.011	10.404	6.232	-2.810	-1.097	8.485	3.842	-3.200	-1.059
	2	6.518	4.278	-2.949	-1.022	0.798	0.462	3.788	1.483	-1.042	-0.459	4.777	1.598
SBI	1	-0.303	-1.734	-1.893	-1.462	7.092	8.255	-9.130	-6.015	5.912	5.336	-5.440	-2.987
	2	-0.383	-2.190	1.525	1.174	-0.769	-0.854	1.660	1.078	-0.381	-0.326	0.926	0.508
SAI	1	5.311	9.074	-10.73	-6.191	5.074	7.273	-5.669	-3.375	6.204	6.030	-4.595	-2.156
	2	-0.397	-0.661	3.692	2.103	0.369	0.507	-1.344	-0.804	0.864	0.777	-2.166	-1.039
SUNPHARMA	1	-0.038	-0.051	-3.609	-2.080	9.655	8.985	-7.376	-5.026	7.512	5.875	-3.512	-2.141
	2	-1.853	-2.486	-0.686	-0.396	3.118	2.743	1.171	0.789	2.950	2.204	0.887	0.539
SUPREMEIND	1	7.769	5.515	0.836	0.297	3.03	3.687	-1.89	-1.593	7.182	3.444	-5.336	-1.856
	2	-0.646	-0.455	0.131	0.046	-8.75	-1.066	-8.62	-0.723	0.648	0.300	-5.151	-1.768
SUZLON	1	2.617	7.211	-1.690	-1.049	1.005	1.402	-0.782	-0.323	0.579	0.716	-0.297	-0.109
	2	0.445	1.210	1.494	0.928	0.881	1.232	1.033	0.426	0.443	0.550	2.069	0.760
TATACOM	1	7.737	8.484	-10.26	-4.761	5.425	5.286	-1.920	-0.955	5.004	3.878	-2.568	-1.060
	2	2.759	2.952	-1.077	-0.496	0.309	0.292	2.582	1.291	2.877	2.085	5.083	2.144
TCS	1	-1.122	-1.970	-1.659	-1.071	2.703	2.420	-2.761	-1.991	5.012	3.525	-4.01	-2.308
	2	0.403	0.7081	-0.942	-0.610	0.435	0.385	0.067	0.048	1.174	0.795	-0.015	-0.009

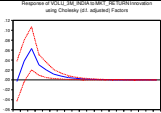
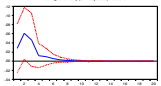
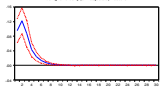
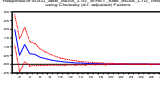
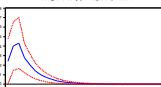
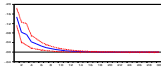
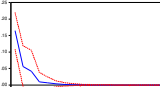
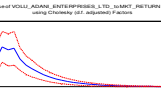
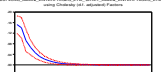
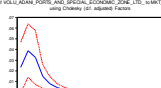
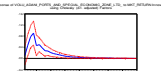
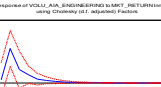
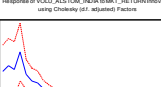
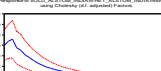
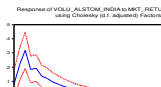
Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
TATACONSUM	1	8.951	10.99	-13.90	-7.401	7.996	6.486	-6.650	-3.47	7.633	4.973	-5.399	-2.267
	2	1.584	1.866	-0.495	-0.261	0.867	0.680	0.768	0.403	1.522	0.941	-1.215	-0.509
TATAELXSI	1	6.185	12.182	-9.687	-5.298	10.290	12.40	-7.534	-4.418	8.660	6.585	-4.888	-2.160
	2	0.271	0.509	1.213	0.659	0.322	0.349	-0.844	-0.491	0.877	0.619	-2.172	-0.956
TATAINVEST	1	23.748	20.214	-16.96	-7.716	18.103	12.507	-14.02	-6.794	18.40	8.656	-13.10	-4.938
	2	5.962	4.503	-3.479	-1.540	4.210	2.608	-0.216	-0.101	4.150	1.749	1.184	0.425
TATAMOTORS	1	1.869	3.261	-5.623	-3.421	6.389	9.845	-7.879	-5.193	7.311	8.374	-7.170	-4.079
	2	-0.179	-0.311	0.665	0.403	0.007	0.010	0.165	0.107	-0.378	-0.390	0.040	0.022
TATAPOWER	1	5.781	6.865	-6.952	-3.659	6.186	8.085	-6.539	-4.178	5.356	4.388	-2.233	-1.115
	2	1.051	1.227	-0.240	-0.126	1.040	1.286	-1.174	-0.754	0.783	0.609	0.109	0.055
TATASTEEL	1	4.657	7.583	-7.727	-4.855	5.377	7.270	-7.043	-4.890	5.641	5.736	-6.733	-4.058
	2	-1.334	-2.135	1.184	0.739	-1.221	-1.579	2.561	1.746	0.106	0.101	-0.444	-0.266
TECHM	1	-0.151	-0.425	-3.199	-1.888	4.600	4.213	-4.377	-2.586	2.819	1.898	-2.154	-1.025
	2	-0.016	-0.047	0.814	0.482	-0.198	-0.179	2.313	1.355	-0.449	-0.301	2.447	1.163
TITAN	1	5.909	7.124	-5.493	-2.944	7.253	6.217	-6.203	-3.542	5.547	3.779	-4.638	-2.266
	2	0.140	0.166	-0.908	-0.482	0.618	0.511	0.094	0.054	0.306	0.203	0.554	0.269
TORNTPHARM	1	5.693	5.689	-2.822	-1.325	3.242	2.438	-1.020	-0.530	5.636	3.495	1.123	0.536
	2	-0.277	-0.275	1.166	0.548	-1.867	-1.394	3.512	1.827	-0.711	-0.434	3.069	1.472
TORNTPOWER	1	12.174	18.362	-13.81	-7.275	12.63	8.876	-6.806	-3.385	11.906	5.315	-6.229	-2.544
	2	1.662	2.264	1.561	0.812	5.397	3.600	-2.461	-1.231	4.344	1.887	-1.621	-0.656
TRENT	1	0.237	0.546	4.246	1.335	10.58	8.910	-10.01	-4.413	8.624	4.913	-6.037	-1.845
	2	0.199	0.459	-1.818	-0.572	-0.493	-0.397	1.075	0.466	0.421	0.237	-0.015	-0.004
TVSMOTOR	1	7.456	9.875	-8.599	-4.436	9.932	8.892	-4.364	-2.425	5.314	3.668	1.235	0.597
	2	-0.129	-0.166	1.869	0.966	-0.829	-0.697	2.524	1.403	-1.298	-0.875	3.640	1.773
ULTRACEMCO	1	4.576	4.588	-5.144	-2.659	9.114	6.912	-8.063	-4.283	9.063	5.166	-6.875	-2.924
	2	0.385	0.383	0.745	0.387	0.620	0.451	1.447	0.755	3.104	1.652	-1.348	-0.564

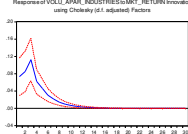
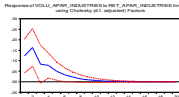
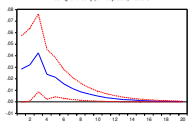
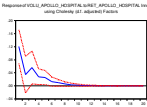
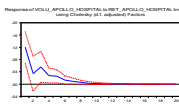
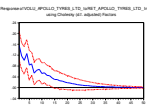
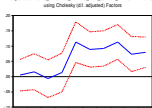
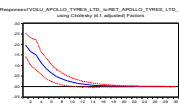
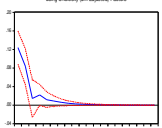
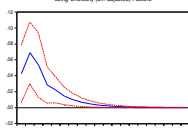
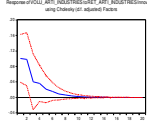
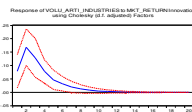
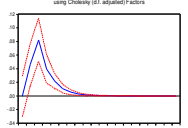
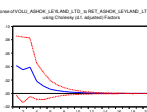
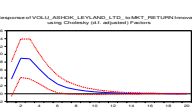
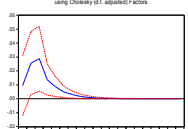
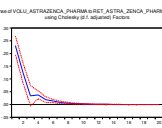
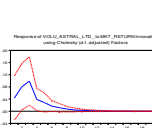
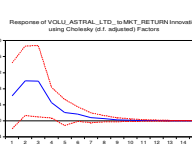
Symbol	Lag	White swan				Grey swan				Black San			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Co eff	T stat	Coeff	T stat	Coeff	T stat
UNIONBANK	1	3.743	7.970	-10.188	-6.350	6.955	8.770	-5.152	-3.292	6.430	5.156	-1.731	-0.906
	2	-0.176	-0.369	2.102	1.292	2.126	2.529	-1.121	-0.724	2.287	1.742	-0.754	-0.401
UBL	1	9.112	9.748	-10.65	-5.161	8.851	6.042	-5.694	-2.761	10.848	5.789	-4.987	-2.120
	2	0.191	0.198	0.600	0.288	2.445	1.605	-0.696	-0.339	2.231	1.117	-1.963	-0.846
MCDHOLDING	1	0.276	0.875	-1.317	-0.747	9.256	8.218	-8.878	-5.100	8.93	5.694	-6.608	-2.995
	2	-0.290	-0.918	3.968	2.255	2.021	1.703	0.327	0.184	2.141	1.287	-0.154	-0.068
UPL	1	3.775	5.986	-5.024	-2.871	5.051	5.319	-4.692	-2.609	1.186	0.910	1.579	0.668
	2	0.066	0.104	0.169	0.097	0.475	0.491	-2.382	-1.322	0.146	0.114	-1.169	-0.493
VEDL	1	3.306	6.208	-7.363	-4.347	3.335	4.561	-4.428	-2.683	1.885	1.846	-1.250	-0.600
	2	-0.163	-0.303	1.024	0.599	0.434	0.583	-0.740	-0.445	-0.068	-0.066	0.068	0.032
VOLTAS	1	6.421	9.220	-7.276	-4.016	10.67	8.439	-6.523	-3.494	9.878	5.849	-2.499	-1.129
	2	0.743	1.039	-0.601	-0.335	0.710	0.528	0.177	0.0943	1.535	0.847	0.554	0.25
WIPRO	1	-0.102	-0.182	-3.576	-2.288	10.975	10.127	-8.016	-5.083	9.738	6.820	-5.567	-2.941
	2	-0.576	-1.033	2.397	1.533	0.208	0.176	1.151	0.7219	-0.149	-0.095	0.529	0.276
YESBANK	1	-0.582	-2.421	-0.809	-0.537	0.399	1.033	-0.484	-0.313	-0.102	-0.229	2.111	1.020
	2	-0.761	-3.178	0.705	0.469	0.044	0.116	2.662	1.708	0.051	0.116	4.184	1.999
ZYDUSLIFE	1	-0.062	-0.164	0.531	0.257	9.131	9.051	-5.344	-3.423	9.702	7.323	-0.855	-0.445
	2	-0.253	-0.670	-0.418	-0.204	1.586	1.461	3.804	2.511	3.263	2.220	4.835	2.690

Source: Computed data

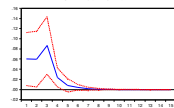
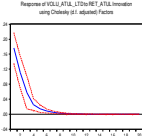
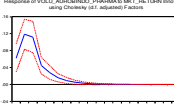
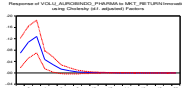
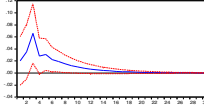
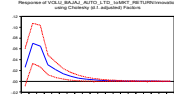
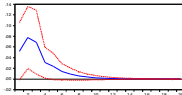
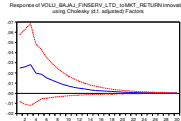
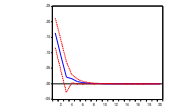
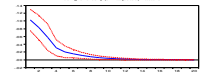
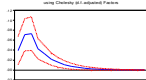
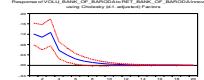
Appendix V

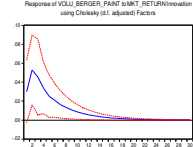
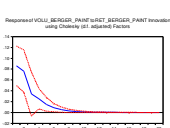
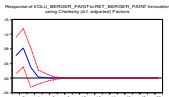
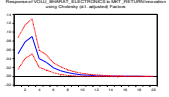
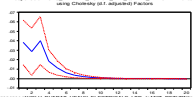
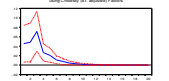
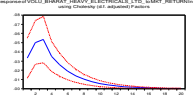
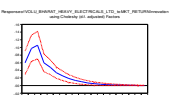
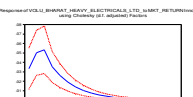
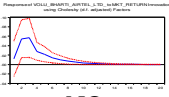
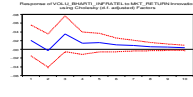
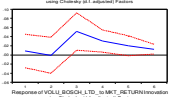
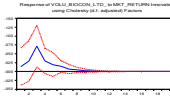
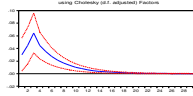
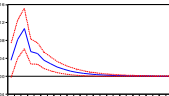
IRF Figures of OD and DE in Large-Cap Stocks Over White Swan, Grey Swan and Black Swan Phases

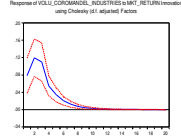
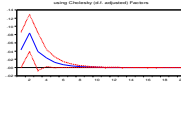
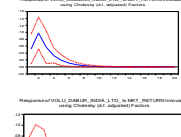
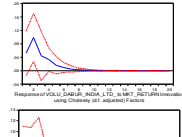
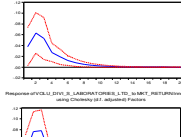
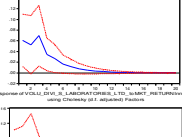
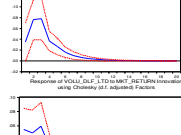
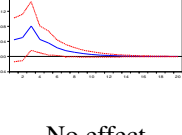
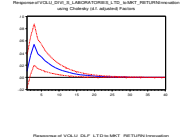
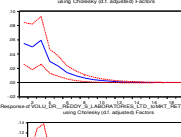
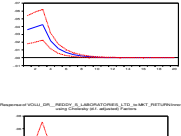
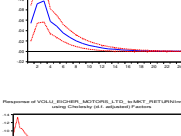
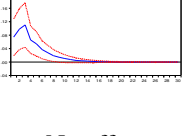
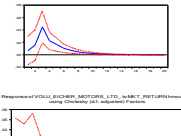
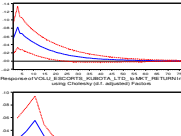
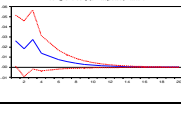
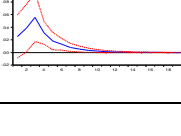
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
1	3MINDIA	No effect		No effect		No effect	No effect
2	ABB	No effect		No effect	No effect		No effect
3	ACC	No effect			No effect		No effect
4	ADANIENT	No effect			No effect	No effect	No effect
5	ADANIPOINTS	No effect		No effect		No effect	No effect
6	AIAENG	No effect		No effect	No effect	No effect	No effect
7	ALSTOM	No effect			No effect	No effect	
8	ALSTOMTD	No effect	No effect	No effect	No effect	No effect	No effect

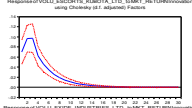
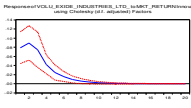
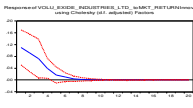
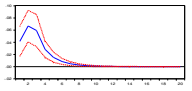
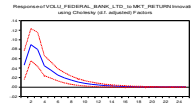
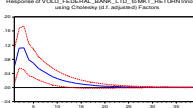
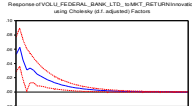
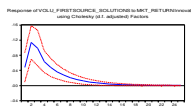
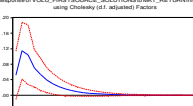
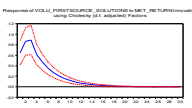
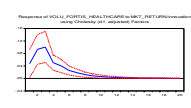
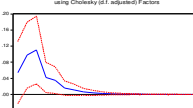
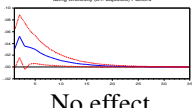
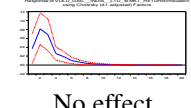
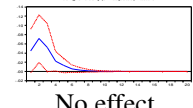
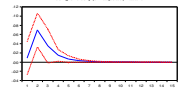
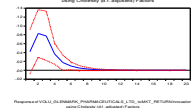
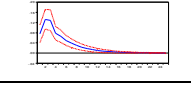
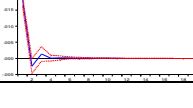
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
9	APARIND	No effect		No effect	No effect		No effect
10	APOLLOHOSP	No effect			No effect		No effect
11	APOLLOTYRE	No effect	No effect				No effect
12	AARTIIND				No effect	No effect	
13	ASHOK	No effect			No effect	No effect	
14	ASIANPAINT	No effect		No effect	No effect	No effect	No effect
15	ASTRAZENCA		NO EFFECT	No effect		No effect	

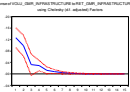
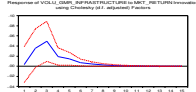
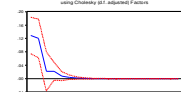
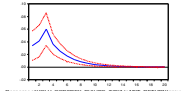
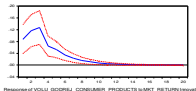
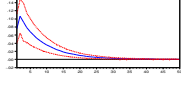
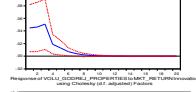
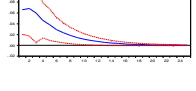
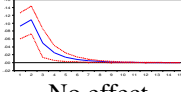
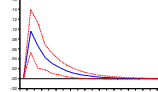
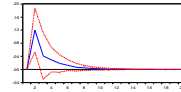
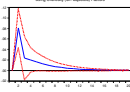
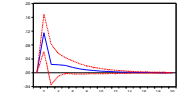
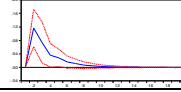
cxl

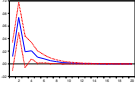
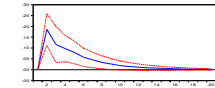
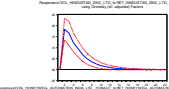
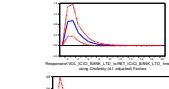
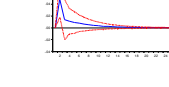
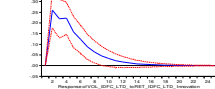
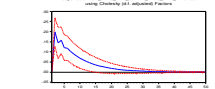
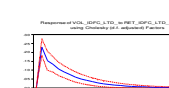
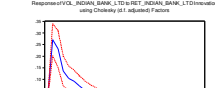
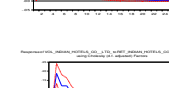
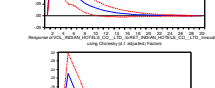
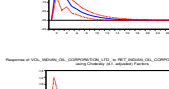
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
16	ASTRAL	No effect	No effect	No effect		No effect	No effect
17	ATUL		No effect	No effect		No effect	
18	AUROBINDO	No effect	No effect	No effect	No effect	No effect	
19	AXIS	No effect	No effect	No effect		No effect	
20	BAJAJ-AUTO	No effect	No effect	No effect	No effect	No effect	No effect
21	BAJFINANCE	No effect		No effect	No effect	No effect	No effect
22	BAJAJFINSV		NO EFFECT	No effect	No effect	No effect	No effect
23	BAJAJHLDNG	No effect	No effect				No effect

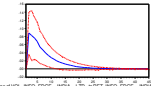
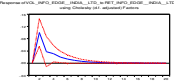
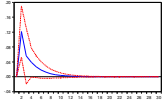
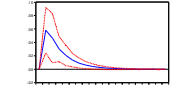
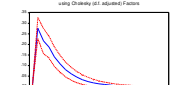
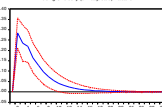
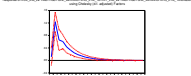
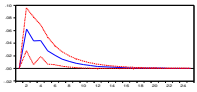
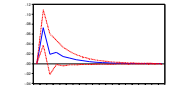
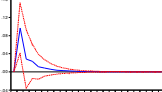
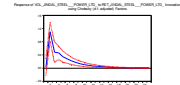
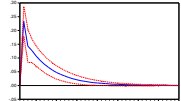
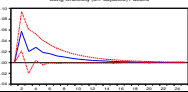
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
24	BANKBARODA	No effect			No effect		No effect
25	BERGEPAINT	No effect	No effect	No effect		No effect	No effect
26	BEL	No effect		No effect		No effect	No effect
27	BHARATFORG	No effect		No effect		No effect	No effect
28	BHEL	No effect		No effect	No effect	No effect	No effect
29	BPCL	No effect	No effect	No effect		No effect	No effect
30	AIRTELPP	No effect	No effect	No effect	NO	No effect	No effect
31	INDUSTOWER	No effect		No effect		No effect	
32	BIOCON	No effect		No effect		No effect	No effect

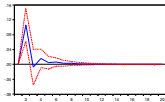
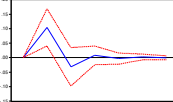
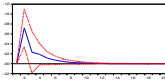
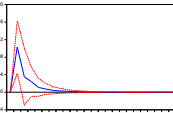
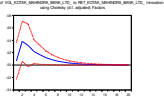
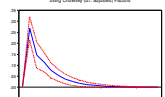
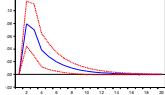
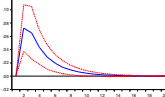
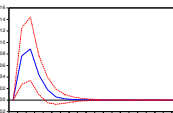
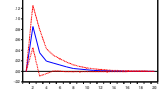
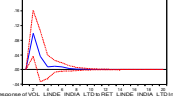
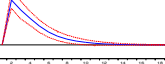
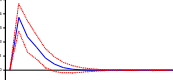
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
41	COROMANDE L	No effect		No effect	No effect	No effect	No effect
42	CRISIL	No effect		No effect		No effect	
43	CUMMINS	No effect	No effect	No effect		No effect	
44	DABURE	No effect	No effect	No effect		No effect	
45	DIVIS	No effect		No effect		No effect	No effect
46	DLF	No effect		No effect		No effect	
47	DRREDDY	No effect		No effect		No effect	No effect
48	EICHERMOT	No effect		No effect		No effect	No effect

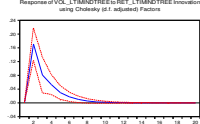
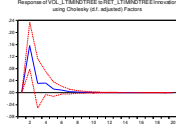
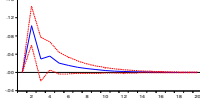
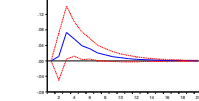
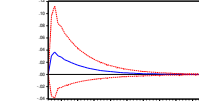
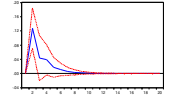
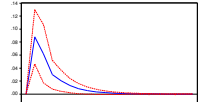
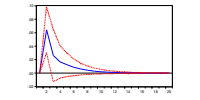
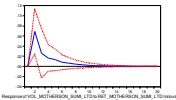
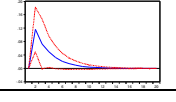
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
49	ESCORT	No effect		No effect		No effect	
50	EXIDE	No effect		No effect	No effect	No effect	No effect
51	SCHAEFFLER	No effect	No effect	No effect		No effect	
52	FEDERALBNK	No effect		No effect		No effect	
53	FSL	No effect		No effect		No effect	
54	FORTIS	No effect		No effect		No effect	
55	GAIL	No effect	No effect	No effect	No effect	No effect	No effect
56	GILLETTE		No effect	No effect		No effect	No effect
57	GSKCONS	No effect	No effect	No effect		No effect	

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
58	GLENMARK	No effect	No effect				No effect
59	GMRINFRA	No effect		No effect		No effect	No effect
60	GODFRYPHLP	No effect		No effect		No effect	No effect
61	GODREJCON	No effect	No effect	No effect		No effect	No effect
62	GODREJPROP	No effect		No effect	No effect	No effect	No effect
63	GRASSIM	No effect	No effect	No effect	No effect	No effect	No effect
64	HDFCBANK	No effect	No effect		No effect		No effect
65	HAVELLS	No effect	No effect	No effect	No effect	No effect	No effect
66	HCLTECH	No effect	No effect		No effect		No effect
67	HEROMOTO	No effect	No effect	No effect	No effect		No effect

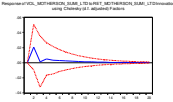
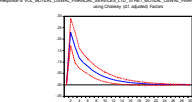
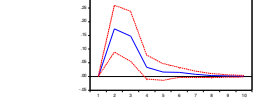
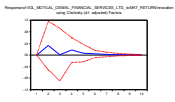
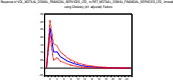
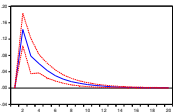
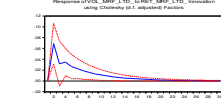
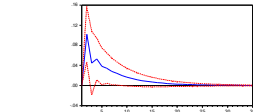
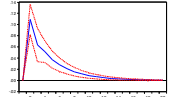
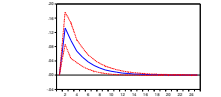
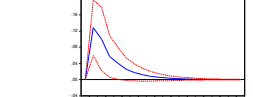
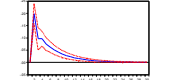
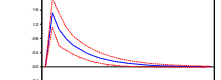
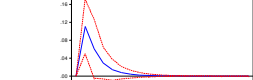
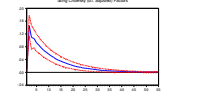
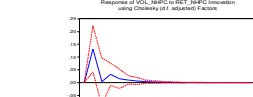
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
68	HINDALCO		No effect	No effect	No effect	No effect	No effect
69	HINDPETRO	No effect	No effect	No effect	No effect		No effect
70	HUL	No effect	No effect		No effect	No effect	No effect
71	HINDZINC	No effect	No effect		No effect	No effect	No effect
72	HONAUT	No effect	No effect		No effect	No effect	No effect
73	ICICI	No effect	No effect	No effect	No effect		No effect
74	IDBI	No effect	No effect	No effect	No effect		No effect
75	IDFC	No effect	No effect		No effect		No effect
76	INDIANB	No effect	No effect		No effect		No effect
77	IHCL		No effect		No effect	No effect	No effect

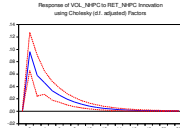
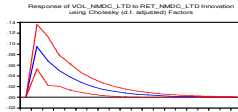
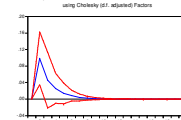
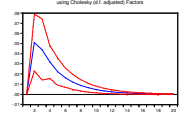
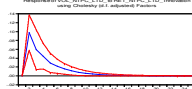
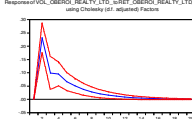
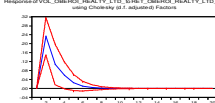
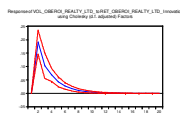
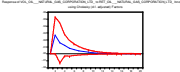
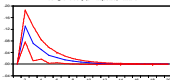
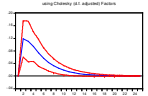
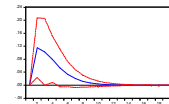
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
78	IOC	No effect	No effect	No effect	No effect		No effect
79	INDUSINDBK	No effect	No effect		No effect		No effect
80	NAUKRI	No effect	No effect		No effect	No effect	No effect
81	INFY	No effect	No effect		No effect		No effect
82	IRB		No effect		No effect	No effect	No effect
83	ITC	No effect	No effect		No effect		No effect
84	JINDALSTEL		No effect		No effect	No effect	No effect
85	JSWENERGY	No effect	No effect		No effect	No effect	No effect

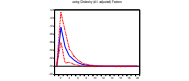
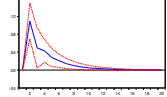
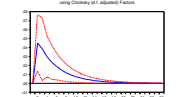
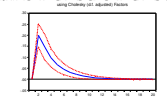
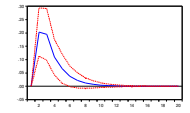
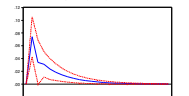
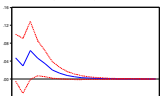
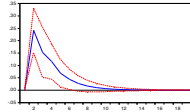
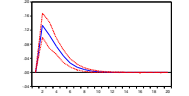
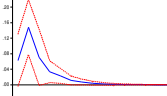
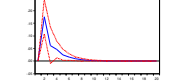
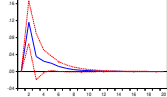
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
86	JSWSTEEL	No effect	No effect		No effect		No effect
87	JUBLFOOD	No effect	No effect		No effect		No effect
88	KOTAKBANK		No effect		No effect	No effect	No effect
89	KPITTECH	No effect	No effect		No effect	No effect	No effect
90	LTF	No effect	No effect		No effect		No effect
91	L&T	No effect	No effect		No effect		No effect
92	LICHSGFIN	No effect	No effect		No effect		No effect

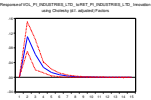
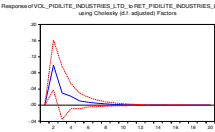
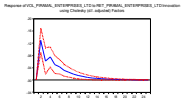
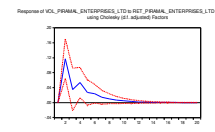
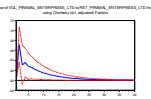
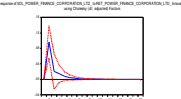
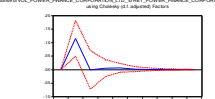
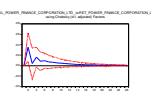
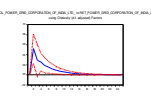
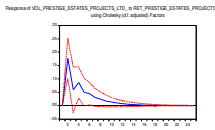
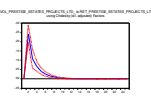
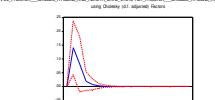
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
93	LINDEINDIA	No effect	No effect		No effect		No effect
94	LTIM	No effect	No effect		No effect	No effect	
95	LUPIN	No effect	No effect	No effect	No effect	No effect	
96	M&MFIN	No effect	No effect	No effect	No effect		No effect
97	M&M	No effect	No effect		No effect	No effect	No effect
98	MARICO	No effect	No effect		No effect		No effect
99	MARUTI	No effect	No effect	No effect	No effect		No effect

cl

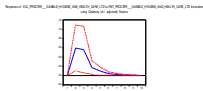
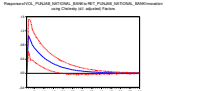
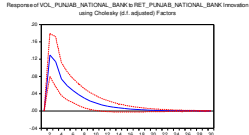
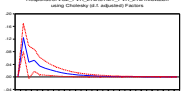
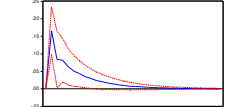
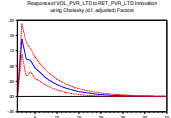
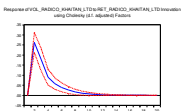
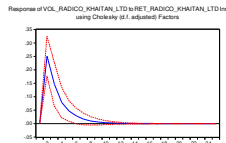
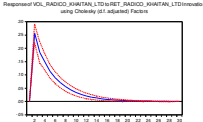
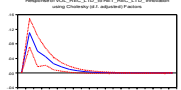
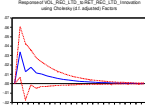
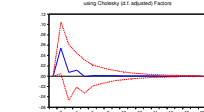
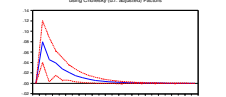
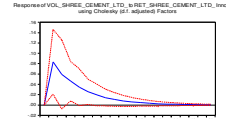
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
100	MOTHERSON		No effect		No effect		
101	MOTLALOFS		No effect	No effect	No effect	No effect	No effect
102	MPHASIS		No effect		No effect		No effect
103	MRF		No effect		No effect		No effect
104	MUTHOOTFIN		No effect		No effect		No effect
105	NATIONALUM		No effect	No effect	No effect		No effect

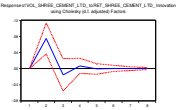
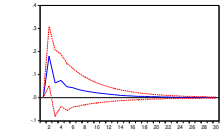
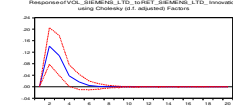
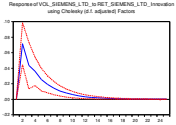
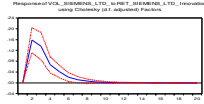
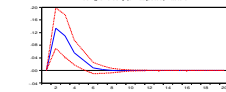
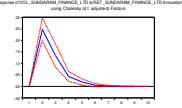
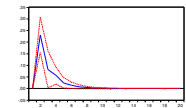
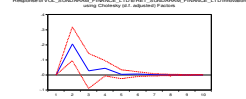
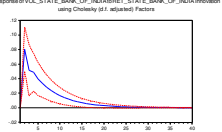
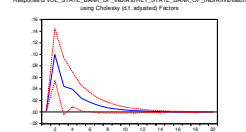
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
106	NHPC		No effect		No effect		No effect
107	NMDC		No effect		No effect	No effect	No effect
108	NTPC	No effect	No effect		No effect		No effect
109	OBEROI, REALTY		NO EFFECT	No effect	No effect	No effect	No effect
110	ONGC		NO EFFECT		No effect	No effect	No effect
111	OILINDIA	No effect	No effect		No effect		No effect

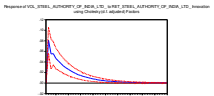
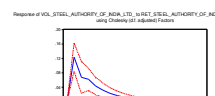
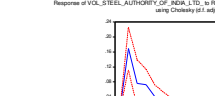
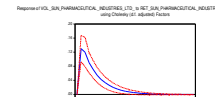
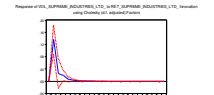
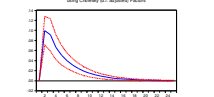
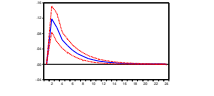
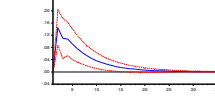
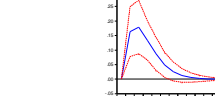
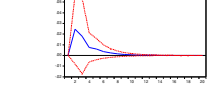
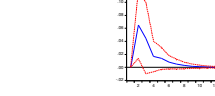
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
112	ORACLE		No effect		No effect	No effect	No effect
113	PAGEIND		No effect		No effect		No effect
114	PERSISTENT	No effect	No effect	No effect	No effect	No effect	No effect
115	PETRONET		No effect	No effect			No effect
116	PFIZER		No effect		No effect	No effect	No effect
117	PHOENIX		No effect		No effect	No effect	No effect

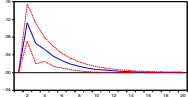
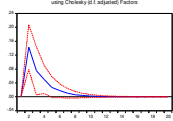
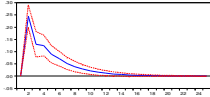
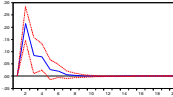
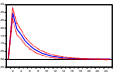
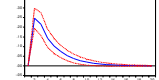
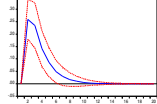
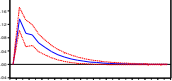
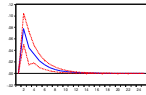
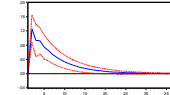
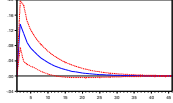
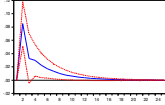
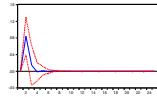
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
118	PIIND		No effect	No effect	No effect		No effect
119	PIDILITE	No effect	No effect		No effect		No effect
120	PEL		No effect		No effect		No effect
121	PFC		No effect	No effect	No effect	No effect	No effect
122	POWERGRID		No effect	No effect	No effect		No effect
123	PRESTIGE		No effect	No effect	No effect		No effect

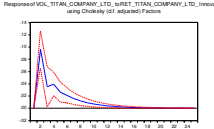
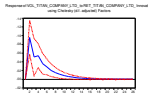
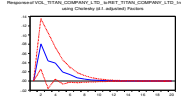
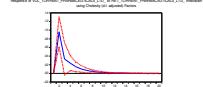
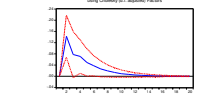
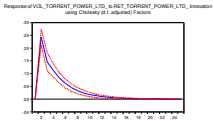
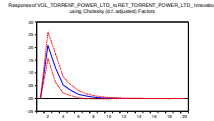
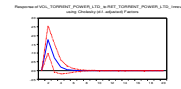
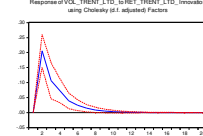
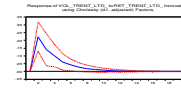
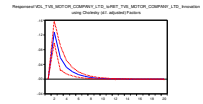
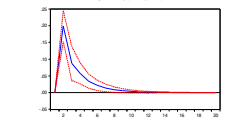
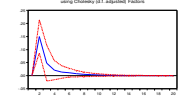
cliv

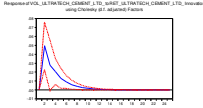
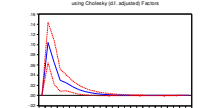
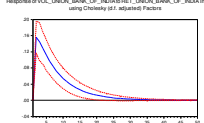
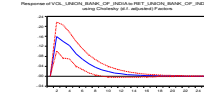
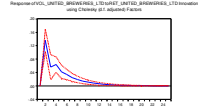
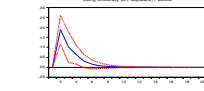
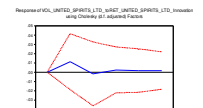
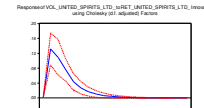
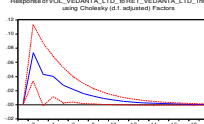
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
124	PGHH		No effect		No effect		No effect
125	PNB	No effect	No effect		No effect		No effect
126	PVR		No effect		No effect		No effect
127	RADICO		No effect		No effect	No effect	No effect
128	REC		No effect	No effect	No effect		No effect
129	RELIANCE	No effect	No effect		No effect		No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
130	SHREECEM		No effect	No effect	No effect		No effect
131	SRIRAMFIN	No effect	No effect	No effect	No effect		No effect
132	SIEMENS		No effect		No effect	No effect	No effect
133	SRF	No effect	No effect	No effect	No effect		No effect
134	SUNDARAMFIN		No effect		No effect		No effect
135	SBI	No effect	No effect		No effect		No effect

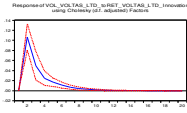
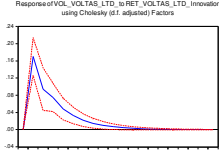
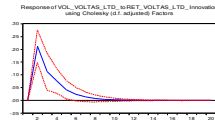
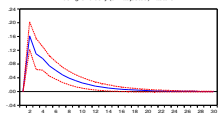
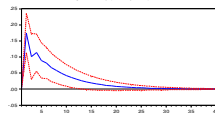
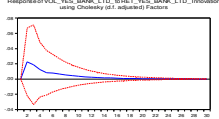
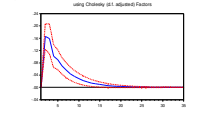
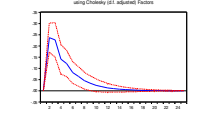
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
136	SAI		No effect		No effect		No effect
137	SUNPHARMA	No effect	No effect		No effect	No effect	No effect
138	SUPREMEIND		No effect	No effect	No effect	No effect	No effect
139	SUZLON		No effect	No effect	No effect	No effect	No effect
140	TATACOM		No effect		No effect		No effect
141	TCS	No effect	No effect		No effect		No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
142	TATACONSUM	No effect	No effect	Response of VOL_TATA_CONSUMER_PRODUCTS_LTD. to RET_TATA_CONSUMER_PRODUCTS_LTD. Innov using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_CONSUMER_PRODUCTS_LTD. to RET_TATA_CONSUMER_PRODUCTS_LTD. Innovation using Cholesky (0.1 adjusted) Factors 	No effect
143	TATAELXSI	No effect	No effect	Response of VOL_TATA_ELXSI_LTD to RET_TATA_ELXSI_LTD Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_ELXSI_LTD to RET_TATA_ELXSI_LTD Innovation using Cholesky (0.1 adjusted) Factors 	No effect
144	TATAINVEST	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_INVESTMENT_CORPORATION_LTD to RET_TATA_INVESTMENT_CORPORATION_LTD Innovation using Cholesky (0.1 adjusted) Factors 	No effect
145	TATAMOTORS	No effect	No effect	Response of VOL_TATA_MOTORS_LTD. to RET_TATA_MOTORS_LTD. Innovation using Cholesky (0.7 adjusted) Factors 	No effect	No effect	No effect
146	TATAPOWER	Response of VOL_TATA_POWER_CO_LTD. to RET_TATA_POWER_CO_LTD. Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_POWER_CO_LTD. to RET_TATA_POWER_CO_LTD. Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_POWER_CO_LTD. to RET_TATA_POWER_CO_LTD. Innovation using Cholesky (0.1 adjusted) Factors 	No effect
147	TATASTEEL	No effect	No effect	Response of VOL_TATA_STEEL_LTD. to RET_TATA_STEEL_LTD. Innovation using Cholesky (0.7 adjusted) Factors 	No effect	Response of VOL_TATA_STEEL_LTD. to RET_TATA_STEEL_LTD. Innovation using Cholesky (0.1 adjusted) Factors 	No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
148	TECHM	No effect	No effect	No effect	No effect	No effect	No effect
149	TITAN		No effect		No effect		No effect
150	TORNTPHARM		No effect	No effect	No effect		No effect
151	TORNTPOWER		No effect		No effect		No effect
152	TRENT	No effect	No effect		No effect		No effect
153	TVSMOTOR		No effect		No effect		No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
154	ULTRACEMCO		No effect		No effect	No effect	No effect
155	UNIONBANK	No effect	No effect		No effect		No effect
156	UBL		No effect	No effect	No effect		No effect
157	MCDHOLDING		No effect		No effect	No effect	No effect
158	UPL	No effect	No effect	No effect	No effect	No effect	No effect
159	VEDL	No effect	No effect		No effect	No effect	No effect

clx

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
160	VOLTAS		No effect		No effect		No effect
161	WIPRO	No effect	No effect		No effect		No effect
162	YESBANK	No effect	No effect		No effect	No effect	No effect
163	ZYDUSLIFE	No effect	No effect		No effect		No effect
		51	38	81	41	72	27

Source: Computed data

Appendix VI

IRF Statistics of OC and DE in Large-Cap Stocks Over White swan, Grey Swan and Black Swan Phases

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
1	3MINDIA	-	-	-	-	-	-	-	-	-	-	-	-	2	6.1	2	12	-	-	-	-	-	-	-	-
2	ABB	1	19.9	1	25	-	-	-	-	-	-	-	--	-	-	-	-	1	19.9	1	25	-	-	-	-
3	ACC	1	16	1	10	-	-	-	-	1	14	2	21	-	-	-	-	1	16	1	10	-	-	-	-
4	ADANIEN'T	-	-	-	-	-	-	-	-	1	15.2	2	17	-	-	-	-	-	-	-	-	-	-	-	-
5	ADANIPORTS	-	-	-	-	-	-	-	-	-	-	-	-	4	9.1	5	31	-	-	-	-	-	-	-	-
6	AIAENG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	ALSTOM	-	-	-	-	3	32	4	29	3	14.4	3	37	-	-	-	-	-	-	-	-	3	32	4	29
8	ALSTOMTD	-	-	-	-	-	-	--	-	-	-	--	-	-	-	-	-	-	-	-	-	-	--	-	-
9	APARIND	2	16.4	3	15	-	-	-	--	-	-	-	-	-	-	-	-	2	16.4	3	15	-	-	-	--
10	APOLLOHOSP	1	12.1	1	13	-	-	-	-	1	12.1	1	12	-	-	-	-	1	12.1	1	13	-	-	-	-
11	APOLLOTYRE	1	19.8	23	-	-	-	-	-	1	15.7	1	49	2	1.6	2	3	1	19.8	23	-	-	-	-	-
12	AARTIIND	-	-	-	-	2	16.8	2	15	1	10	2	15	-	-	-	-	-	-	-	-	2	16.8	2	15
13	ASHOK	-	-	-	-	2	9	3	16	1	4.2	2	16	-	-	-	-	-	-	-	-	2	9	3	16
14	ASIANPAINT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	ASTRAZENCA					3	13.2	3	19	-	-	-	-	3	12.5	3	22					3	13.2	3	19A
16	ASTRAL					2	10	3	13	-	-	-	-	3	9	3	15					2	10	3	13
17	ATUL	-	-	-	-	-	-	-	-	-	-	-	-	3	8.7	3	9	-	-	-	-	-	-	-	-
18	AUROBINDO	-	-	-	-	3	12.8	3	11	-	-	-	-	2	11.9	3	13	-	-	-	-	3	12.8	3	11
19	AXIS	-	-	-	-	3	6.6	3	27	-	-	-	-	-	-	-	-	-	-	-	-	3	6.6	3	27
20	BAJAJ-AUTO	-	-	-	-	2	7.8	3	15	-	-	-	-	2	7	2	15	-	-	-	-	2	7.8	3	15
21	BAJFINANCE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	BAJAJFINSV	-	-	-	-	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-
23	BAJAJHLDNG	-	-	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-	-
24	BANKBARODA	3	12.7	3	15	-	-	-	-	1	10.3	1	17	3	7.3	3	17	3	12.7	3	15	-	-	-	-
25	BERGEPAINT	2	8.3	2	5	-	-	-	-	1	8.6	1	13	-	-	-	-	2	8.3	2	5	-	-	-	-
26	BEL	-	-	-	-	-	-	-	-	-	-	-	-	3	9	3	17	-	-	-	-	-	-	-	-
27	BHARATFORG	-	-	-	-	-	-	-	-	-	-	-	-	3	7.1	3	13	-	-	-	-	-	-	-	-
28	BHEL	-	-	-	-	-	-	-	-	-	-	-	-	3	10.6	3	19	-	-	-	-	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
29	BPCL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	AIRTELPP	-	-	-	-	-	-	-	-	-	-	-	-	3	5.3	3	17	-	-	-	-	-	-	-	-
31	INDUSTOWER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	BIOCON	-	-	-	-	3	7.2	3	13	-	-	-	-	1	0.9	1	2	-	-	-	-	3	7.2	3	13
33	BOSCH	-	-	-	-	-	-	-	-	-	-	-	-	3	10.7	3	23	-	-	-	-	-	-	-	-
34	BRITANNIA	-	-	-	-	3	11	3	32	-	-	-	-	2	8.3	2	19	-	-	-	-	3	11	3	32
35	CANARA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	CHOLAFIN	-	-	-	-	-	-	-	-	-	-	-	-	3	8.2	3	23	-	-	-	-	-	-	-	-
37	CIPLA	-	-	-	-	3	14.2	3	17	-	-	-	-	3	9.6	3	21	-	-	-	-	3	14.2	3	17
38	COALINDIA	-	-	-	-	-	-	-	-	-	-	-	-	4	9.3	4	16	-	-	-	-	-	-	-	-
39	COLGATE	-	-	-	-	2	8.1	2	10	-	-	-	-	2	7.3	2	11	-	-	-	-	2	8.1	2	10
40	CONCOR	-	-	-	-	2	12.1	2	16	-	-	-	-	2	11.5	2	16	-	-	-	-	2	12.1	2	16
41	COROMANDEL	--	-	-	-	3	9.8	4	17	-	-	-	-	3	12.1	3	16	--	-	-	-	3	9.8	4	17
42	CRISIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	CUMMINS	-	-	-	-	2	9.9	2	12	-	-	-	-	2	9.8	2	12	-	-	-	-	2	9.9	2	12
44	DABURE	-	-	-	-	3	7	3	17	-	-	-	-	2	6.3	2	14	-	-	-	-	3	7	3	17
45	DIVIS	-	-	-	-	3	8.1	3	17	-	-	-	-	3	7.8	3	16	-	-	-	-	3	8.1	3	17
46	DLF	-	-	-	-	-	-	-	-	-	-	-	-	3	5.9	3	17	-	-	-	-	-	-	-	-
47	DRREDDY	-	-	-	-	3	11	3	20	-	-	-	-	3	9.7	3	23	-	-	-	-	3	11	3	20
48	EICHERMOT	-	-	-	-	-	-	-	-	-	-	-	-	3	8.3	3	78	-	-	-	-	-	-	-	-
49	ESCORT	-	-	-	-	-	-	-	-	-	-	-	-	3	5.6	3	16	-	-	-	-	-	-	-	-
50	EXIDE	-	-	-	-	1	11	1	11	-	-	-	-	2	9	2	15	-	-	-	-	1	11	1	11
51	SCHAEFFLER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	FEDERALBNK	-	-	-	-	2	11.2	3	29	-	-	-	-	2	8.9	2	21	-	-	-	-	2	11.2	3	29
53	FSL	-	-	-	-	2	11.5	2	22	-	-	-	-	2	11.4	2	23	-	-	-	-	2	11.5	2	22
54	FORTIS	-	-	-	-	3	11	3	14	-	-	-	-	3	10.1	3	18	-	-	-	-	3	11	3	14
55	GAIL	-	-	-	-	2	7.1	2	10	-	-	-	-	2	8.2	2	13	-	-	-	-	2	7.1	2	10
56	GILLETTE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	GSKCONS	-	-	-	--	-	-	-	-	-	-	-	-	2	8.3	2	12	-	-	-	--	-	-	-	-
58	GLENMARK	-	-	-	-	1	1.8	1	2	-	-	-	-	2	13.3	2	24	-	-	-	-	1	1.8	1	2
59	GMRINFRA	1	12.9	2	9	-	-	-	-	1	12.6	1	11	3	4.9	3	12	1	12.9	2	9	-	-	-	-
60	GODFRYPHLP	-	-	-	-	-	-	-	-	-	-	-	-	3	12.7	3	18	-	-	-	-	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
61	GODREJCON	-	-	-	-	-	-	-	-	-	-	-	-	3	5.1	3	12	-	-	-	-	-	-	-	-
62	GODREJPROP	-	-	-	-	-	-	-	-	-	-	-	-	2	6.8	2	23	-	-	-	-	-	-	-	-
63	GRASSIM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	HDFCBANK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	HAVELLS	2	12	2	13	-	-	-	-	2	9.6	2	17	-	-	-	-	2	12	2	13	-	-	-	-
66	HCLTECH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	HEROMOTO	2	11.5	2	18	-	-	-	-	2	8.1	2	21	-	-	-	-	2	11.5	2	18	-	-	-	-
68	HINDALCO	2	11.6	2	14	-	-	-	-	-	-	-	-	-	-	-	-	2	11.6	2	14	-	-	-	-
69	HINDPETRO	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-	-	-	-
70	HUL	2	18	2	22	-	-	-	-	-	-	-	-	-	-	-	-	2	18	2	22	-	-	-	-
71	HINDZINC	-	-	-	-	-	-	-	-	2	18.4	2	21	-	-	-	-	-	-	-	-	-	-	-	-
72	HONAUT	-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	ICICI	-	-	-	-	-	-	-	-	3	9.6	3	11	-	-	-	-	-	-	-	-	-	-	-	-
74	IDBI	2	26	2	21	-	-	-	-	-	-	-	-	-	-	-	-	2	26	2	21	-	-	-	-
75	IDFC	2	19.9	2	46	-	-	-	-	--	-	-	-	-	-	-	-	2	19.9	2	46	-	-	-	-
76	INDIANB	2	27	2	27	-	-	-	-	2	23	2	29	-	-	-	-	2	27	2	27	-	-	-	-
77	IHCL	2	22	2	10	-	-	-	-	2	18.8	2	22	-	-	-	-	2	22	2	10	-	-	-	-
78	IOC	-	-	-	-	-	-	-	-	2	8.5	2	21	-	-	-	-	-	-	-	-	-	-	-	-
79	INDUSINDBK	2	8.9	2	38	-	-	-	-	-	-	-	-	-	-	-	-	2	8.9	2	38	-	-	-	-
80	NAUKRI	2	12.1	2	15	-	-	-	-	2	10.1	2	15	-	-	-	-	2	12.1	2	15	-	-	-	-
81	INFY	-	-	-	-	-	-	-	-	2	5.8	2	17	-	-	-	-	-	-	-	-	-	-	-	-
82	IRB	2	28.5	2	23	-	-	-	-	2	27.8	2	22	-	-	-	-	2	28.5	2	23	-	-	-	-
83	ITC	-	-	-	-	-	-	-	-	2	6.2	2	22	-	-	-	-	-	-	-	-	-	-	-	-
84	JINDALSTEL	2	9.7	2	14	-	-	-	-	2	7.3	2	19	-	-	-	-	2	9.7	2	14	-	-	-	-
85	JSWENERGY	-	-	-	-	-	-	-	-	2	23	2	35	-	-	-	-	-	-	-	-	-	-	-	-
86	JSWSTEEL	-	-	-	-	-	-	-	-	2	5.2	2	23	-	-	-	-	-	-	-	-	-	-	-	-
87	JUBLFOOD	2	10.4	2	3	-	-	-	-	2	10.7	2	3	-	-	-	-	2	10.4	2	3	-	-	-	-
88	KOTAKBANK	2	10.3	2	12	-	-	-	-	2	7.2	2	13	-	-	-	-	2	10.3	2	12	-	-	-	-
89	KPITTECH	-	-	-	-	-	-	-	-	2	26.9	2	17	-	-	-	-	-	-	-	-	-	-	-	-
90	LTF	-	-	-	-	-	-	-	-	2	8	2	20	-	-	-	-	-	-	-	-	-	-	-	-
91	L&T	3	8.9	3	10	-	-	-	-	2	7.3	2	18	-	-	-	-	3	8.9	3	10	-	-	-	-
92	LICHSGFIN	2	9.9	2	11	-	-	-	-	2	8.5	2	17	-	-	-	-	2	9.9	2	11	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
93	LINDEINDIA	2	37	2	10	-	-	-	-	2	33	2	17	-	-	-	-	2	37	2	10	-	-	-	-
94	LTIM	2	15	2	11	-	-	-	-	2	17	2	12	-	-	-	-	2	15	2	11	-	-	-	-
95	LUPIN	-	-	-	-	3	7.3	3	20	2	10.3	2	18	-	-	-	-	-	-	-	-	3	7.3	3	20
96	M&MFIN	-	-	-	-	3	3.7	3	43	-	-	-	-	-	-	-	-	-	-	-	-	3	3.7	3	43
97	M&M	2	12.7	2	12	-	-	-	-	-	-	-	-	-	-	-	-	2	12.7	2	12	-	-	-	-
98	MARICO	-	-	-	-	-	-	-	-	2	8.8	2	15	-	-	-	-	-	-	-	-	-	-	-	-
99	MARUTI	2	6.9	2	15	-	-	-	-	2	6.4	2	16	-	-	-	-	2	6.9	2	15	-	-	-	-
100	MOTHERSON	2	11.6	2	14	-	-	-	-	-	-	-	-	-	-	-	-	2	11.6	2	14	-	-	-	-
101	MOTLALOFS	2	17.5	2	10	2	3.3	2	10	2	23.1	2	27	-	-	-	-	2	17.5	2	10	2	3.3	2	10
102	MPHASIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	MRF	2	10.2	2	13	-	-	-	-	2	6.9	2	28	-	-	-	-	2	10.2	2	13	-	-	-	-
104	MUTHOOTFIN	2	12.9	2	17	-	-	-	-	2	13.2	2	21	-	-	-	-	2	12.9	2	17	-	-	-	-
105	NATIONALUM	2	11.1	2	11	-	-	-	-	2	15.3	2	24	-	-	-	-	2	11.1	2	11	-	-	-	-
106	NHPC	2	13.2	2	11	-	-	-	-	-	-	-	-	-	-	-	-	2	13.2	2	11	-	-	-	-
107	NMDC	2	9.8	2	10	-	-	-	-	2	9.5	2	22	-	-	-	-	2	9.8	2	10	-	-	-	-
108	NTPC	-	-	-	-	-	-	-	-	2	9.8	2	20	-	-	-	-	-	-	-	-	-	-	-	-
109	OBEROIRLTY	2	23	2	9	-	-	-	-	2	23.2	2	22	-	-	-	-	2	23	2	9	-	-	-	-
110	ONGC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	OILINDIA	-	-	-	-	-	-	-	-	2	13.1	2	17	-	-	-	-	-	-	-	-	-	-	-	-
112	ORACLE	2	11.6	2	16	-	-	-	-	2	11.8	2	23	-	-	-	-	2	11.6	2	16	-	-	-	-
113	PAGEIND	-	-	-	-	-	-	-	-	2	11	2	17	-	-	-	-	-	-	-	-	-	-	-	-
114	PERSISTENT	2	20.4	2	14	-	-	-	-	2	20	2	18	-	-	-	-	2	20.4	2	14	-	-	-	-
115	PETRONET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	PFIZER	2	24.2	2	15	-	-	-	-	-	-	-	-	3	6.4	3	15	2	24.2	2	15	-	-	-	-
117	PHOENIX	-	-	-	-	-	-	-	-	2	14.9	2	12	-	-	-	-	-	-	-	-	-	-	-	-
118	PIIND	-	-	-	-	-	-	-	-	2	11.1	2	16	-	-	-	-	-	-	-	-	-	-	-	-
119	PIDILITE	2	10	2	12	-	-	-	-	-	-	-	-	-	-	-	-	2	10	2	12	-	-	-	-
120	PEL	2	11.7	2	17	-	-	-	-	2	13	2	23	-	-	-	-	2	11.7	2	17	-	-	-	-
121	PFC	2	11.6	2	3	-	-	-	-	2	9.6	2	11	-	-	-	-	2	11.6	2	3	-	-	-	-
122	POWERGRID	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
123	PRESTIGE	2	17.7	2	20	-	-	-	-	-	-	-	-	-	-	-	-	2	17.7	2	20	-	-	-	-
124	PGHH	2	14	2	8	-	-	-	-	-	-	-	-	-	-	-	-	2	14	2	8	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
125	PNB	2	13	2	25	-	-	-	-	2	10.7	2	60	-	-	-	-	2	13	2	25	-	-	-	-
126	PVR	2	16.6	2	31	-	-	-	-	2	12.4	2	24	-	-	-	-	2	16.6	2	31	-	-	-	-
127	RADICO	2	25	2	13	-	-	-	-	2	26.3	2	16	-	-	-	-	2	25	2	13	-	-	-	-
128	REC	-	-	-	-	-	-	-	-	2	11.1	2	14	-	-	-	-	-	-	-	-	-	-	-	-
129	RELIANCE	2	5.4	2	11	-	-	-	-	-	-	-	-	-	-	-	-	2	5.4	2	11	-	-	-	-
130	SHREECEM	2	8.4	2	19	-	-	-	-	2	8	2	20	-	-	-	-	2	8.4	2	19	-	-	-	-
131	SRIRAMFIN	2	18	2	27	-	-	-	-	-	-	-	-	-	-	-	-	2	18	2	27	-	-	-	-
132	SIEMENS	2	14	2	8	-	-	-	-	2	15.8	2	12	-	-	-	-	2	14	2	8	-	-	-	-
133	SRF	2	13.4	2	8	-	-	-	-	-	-	-	-	-	-	-	-	2	13.4	2	8	-	-	-	-
134	SUNDARAMFIN	2	21	2	7	-	-	-	-	2	23	2	11	-	-	-	-	2	21	2	7	-	-	-	-
135	SBI	2	10	2	15	-	-	-	-	2	8	2	33	-	-	-	-	2	10	2	15	-	-	-	-
136	SAI	2	16.9	2	16	-	-	-	-	2	12.4	2	19	-	-	-	-	2	16.9	2	16	-	-	-	-
137	SUNPHARMA	-	-	-	-	-	-	-	-	2	13	2	26	-	-	-	-	-	-	-	-	-	-	-	-
138	SUPREMEIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
139	SUZLON	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140	TATACOM	3	17.9	3	11	-	-	-	-	2	14.2	2	46	-	-	-	-	3	17.9	3	11	-	-	-	-
141	TCS	2	6.5	2	13	-	-	-	-	2	2.5	2	13	-	-	-	-	2	6.5	2	13	-	-	-	-
142	TATACONSUM	2	14.3	2	13	-	-	-	-	2	11.3	2	19	-	-	-	-	2	14.3	2	13	-	-	-	-
143	TATAELXSI	2	21	2	9	-	-	-	-	2	24.5	2	21	-	-	-	-	2	21	2	9	-	-	-	-
144	TATAINVEST	2	25.9	2	19	-	-	-	-	2	24.6	2	20	-	-	-	-	2	25.9	2	19	-	-	-	-
145	TATAMOTORS	-	-	-	-	-	-	-	-	2	13.6	2	24	-	-	-	-	-	-	-	-	-	-	-	-
146	TATAPOWER	2	13.6	2	37	-	-	-	-	2	12.6	2	34	-	-	-	-	2	13.6	2	37	-	-	-	-
147	TATASTEEL	2	8.4	2	4	-	-	-	-	2	8.5	2	21	-	-	-	-	2	8.4	2	4	-	-	-	-
148	TECHM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
149	TITAN	2	8.1	2	13	-	-	-	-	2	9.6	2	21	-	-	-	-	2	8.1	2	13	-	-	-	-
150	TORNTPHARM	2	14.2	2	19	-	-	-	-	--	-	-	-	-	-	-	-	2	14.2	2	19	-	-	-	-
151	TORNTPOWER	2	17.8	2	7	-	-	-	-	2	20.9	2	12	-	-	-	-	2	17.8	2	7	-	-	-	-
152	TRENT	2	22.4	2	16	-	-	-	-	2	22.6	2	13	-	-	-	-	2	22.4	2	16	-	-	-	-
153	TVSMOTOR	2	15	2	14	-	-	-	-	2	19.9	2	14	-	-	-	-	2	15	2	14	-	-	-	-
154	ULTRACEMCO	-	-	-	-	-	-	-	-	2	10.4	2	15	-	-	-	-	-	-	-	-	-	-	-	-
155	UNIONBANK	2	25.9	2	21	-	-	-	-	2	15.6	2	41	-	-	-	-	2	25.9	2	21	-	-	-	-
156	UBL	2	18.9	2	11	-	-	-	-	-	-	-	-	-	-	-	-	2	18.9	2	11	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion
157	MCDHOLDING	-	-	-	-	-	-	-	-	2	13.2	2	15	-	-	-	-	-	-	-	-	-	-	-	-
158	UPL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
159	VEDL	-	-	-	-	-	-	-	-	2	7.4	2	19	-	-	-	-	-	-	-	-	-	-	-	-
160	VOLTAS	2	21	2	12	-	-	-	-	2	17	2	15	-	-	-	-	2	21	2	12	-	-	-	-
161	WIPRO	2	17.4	2	37	-	-	-	-	2	16.2	2	26	-	-	-	-	2	17.4	2	37	-	-	-	-
162	YESBANK	-	-	-	-	-	-	-	-	2	2.3	2	25	-	-	-	-	-	-	-	-	-	-	-	-
163	ZYDUSLIFE	2	23.7	2	22	-	-	-	-	2	16.6	2	27	-	-	-	-	2	23.7	2	22	-	-	-	-
Average		1.972	15.563	2.305	15.422	2.444	10.167	2.667	17.615	1.912	13.403	1.962	20.575	2.609	8.331	2.658	17.853	1.972	15.563	2.305	15.422	2.444	10.167	2.667	17.615

Source: Computed data

Appendix VII

VAR Results of OC and DE in Mid Cap Stocks Over White Swan, Grey Swan and Black Swan Phases

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
AJANTAPHARM	1	0.268	0.616	7.317	4.304	3.897	3.138	-0.004	-0.002	5.170	3.118	-0.793	-0.373
	2	-0.670	-1.546	2.160	1.266	-0.503	-0.406	3.574	2.098	0.346	0.206	2.865	1.348
AKZOINDIA	1	0.969	0.663	8.273	3.262	3.677	2.193	-0.773	-0.394	1.418	0.687	-1.544	-0.677
	2	-1.665	-1.141	8.652	3.418	-0.280	-0.168	-0.076	-0.038	1.865	0.920	-0.660	-0.285
APLLTD	1	0.324	0.311	2.797	1.221	1.300	1.256	-1.863	-1.114	2.028	1.607	-3.489	-1.780
	2	-1.772	-1.728	4.456	1.917	-0.404	-0.398	-1.386	-0.823	0.204	0.165	-1.719	-0.872
ARE&M	1	-1.697	-1.911	5.752	3.062	1.393	1.521	0.671	0.504	1.565	1.361	0.423	0.276
	2	-3.239	-3.674	4.700	2.503	0.005	0.005	1.484	1.121	1.368	1.201	1.618	1.060
AMBUJACEM	1	-0.200	-0.225	3.377	1.927	2.560	2.891	1.911	1.501	1.128	0.859	1.951	1.227
	2	-0.851	-0.963	2.093	1.185	0.137	0.155	3.309	2.590	-1.361	-1.044	3.408	2.116
ANANTRAJ	1	1.092	1.968	5.487	3.136	2.266	3.628	-0.612	-0.319	2.115	3.000	-1.129	-0.546
	2	-2.562	-4.955	8.872	5.172	0.519	0.852	-0.406	-0.213	0.999	1.474	-0.200	-0.098
ASAHIINDIA	1	1.665	1.612	0.077	0.031	0.916	0.743	0.496	0.205	0.701	0.395	1.835	0.609
	2	0.002	0.002	4.619	1.872	-3.205	-2.704	-0.918	-0.378	-1.907	-1.113	-2.947	-0.950
ASHOKA	1	-0.247	-0.285	6.613	2.426	1.345	1.856	-2.572	-1.641	2.003	1.935	-3.974	-1.913
	2	-1.650	-1.917	4.435	1.617	-0.104	-0.146	5.649	3.616	-0.687	-0.679	7.926	3.840
BANKINDIA	1	-0.258	-0.590	3.525	2.546	1.669	2.383	-0.713	-0.541	3.489	3.106	-0.623	-0.392
	2	-0.624	-1.446	2.178	1.586	-0.491	-0.735	0.039	0.029	1.118	1.050	-0.168	-0.106
BASF	1	1.384	1.569	5.943	2.764	2.871	2.872	-1.819	-1.072	4.427	2.911	-1.446	-0.651
	2	-0.727	-0.832	5.457	2.544	-0.103	-0.108	1.020	0.598	-1.213	-0.869	1.225	0.547
BEML	1	-0.577	-0.948	5.103	2.804	3.043	3.317	0.323	0.193	3.483	2.599	-0.505	-0.245
	2	-3.588	-6.257	8.197	4.564	0.171	0.192	-0.393	-0.235	2.215	1.732	-1.412	-0.690

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
BFUTILITIE	1	2.239	3.719	4.893	2.536	2.541	3.450	-3.059	-2.064	2.078	1.771	-2.869	-1.507
	2	-2.691	-4.959	7.516	4.005	-0.675	-0.954	0.524	0.353	-2.193	-1.966	1.163	0.609
BIRLACORPN	1	-1.274	-1.153	8.097	2.841	4.011	4.641	-1.047	-0.667	4.801	3.931	-0.021	-0.010
	2	-4.355	-3.989	3.072	1.075	0.485	0.562	0.769	0.487	0.790	0.655	2.326	1.152
BLUEDART	1	-0.888	-0.646	9.785	3.441	2.170	1.729	1.478	0.767	2.381	1.372	2.481	0.999
	2	-1.340	-0.983	0.502	0.175	-1.923	-1.554	4.583	2.401	-0.404	-0.237	6.731	2.750
BPTC	1	1.826	2.673	6.041	2.894	3.196	3.288	-0.451	-0.292	3.362	2.587	-1.427	-0.723
	2	-4.038	-6.456	9.368	4.541	-0.271	-0.294	-1.269	-0.819	-0.677	-0.554	-1.364	-0.681
BRIGADE	1	1.353	1.564	1.354	0.791	-0.297	-2.115	-1.318	-0.833	1.698	1.642	0.436	0.272
	2	-0.112	-0.131	-2.093	-1.226	0.246	1.783	-0.051	-0.032	0.053	0.051	1.333	0.826
CANFINHOME	1	-0.893	-2.879	8.013	4.489	3.555	3.620	-2.478	-1.441	6.398	4.670	-2.769	-1.338
	2	-0.940	-3.036	1.059	0.592	0.411	0.426	-0.135	-0.078	3.446	2.499	0.007	0.003
CARBORUNIV	1	1.755	1.318	1.087	0.381	3.511	2.781	0.132	0.062	3.699	1.709	-1.109	-0.393
	2	-3.287	-2.498	4.508	1.584	2.694	2.134	4.414	2.079	5.872	2.682	3.123	1.100
CASTROL	1	-0.059	-0.097	4.423	2.459	2.289	2.334	-0.662	-0.484	1.959	1.600	-2.403	-1.420
	2	-1.973	-3.263	2.729	1.522	0.346	0.353	-0.038	-0.028	0.442	0.362	0.037	0.021
CENTRALBK	1	0.971	1.325	4.281	1.982	1.762	2.345	0.505	0.324	2.715	2.360	0.180	0.097
	2	-1.605	-2.227	2.993	1.382	-2.916	-4.153	2.948	1.893	-2.236	-2.019	3.712	1.997
CENTURYPLY	1	-0.295	-0.407	8.656	4.008	5.464	5.389	-0.653	-0.379	6.029	3.641	-1.065	-0.441
	2	-1.679	-2.367	5.842	2.698	0.665	0.659	0.687	0.400	0.030	0.018	-0.274	-0.113
ABREL	1	1.211	3.400	0.921	0.697	0.291	2.266	-0.174	-0.102	1.834	2.042	-1.129	-0.686
	2	-0.553	-1.570	3.839	2.952	0.177	1.396	0.321	0.188	0.363	0.425	-0.059	-0.034
CESC	1	0.503	0.738	4.030	2.460	0.051	0.208	-0.568	-0.350	1.733	1.318	-2.463	-1.373
	2	-0.897	-1.324	2.742	1.682	0.051	0.206	-0.948	-0.584	1.579	1.202	-1.843	-1.021
CHAMBLFERT	1	1.962	2.441	5.948	2.926	1.585	1.646	1.883	1.167	2.058	1.326	1.832	0.908
	2	-1.714	-2.238	5.294	2.636	-0.818	-0.887	2.546	1.576	1.449	0.957	4.041	1.983

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
CUB	1	1.564	1.433	1.417	0.670	1.616	1.713	0.954	0.589	0.863	0.717	1.701	0.822
	2	-0.730	-0.669	3.932	1.856	1.850	1.976	-0.428	-0.261	2.504	2.096	-1.112	-0.526
CROMPTON	1	0.414	1.345	3.453	2.095	0.730	1.926	1.403	0.653	5.820	3.452	3.598	1.182
	2	-0.041	-0.134	4.331	2.625	0.779	2.050	1.138	0.531	3.932	2.331	3.389	1.152
CYIENT	1	0.422	0.326	-0.350	-0.118	2.486	2.620	2.872	1.724	2.682	1.751	2.221	0.974
	2	-0.176	-0.136	5.284	1.794	0.076	0.082	0.250	0.149	0.868	0.576	-0.616	-0.269
DBREALTY	1	2.868	6.513	0.024	0.012	4.987	5.381	0.763	0.389	5.016	5.353	0.821	0.415
	2	-0.023	-0.054	-1.451	-0.753	-0.338	-0.365	2.443	1.248	-0.351	-0.375	2.504	1.269
DCMSHRIRAM	1	0.920	1.438	6.341	2.957	1.044	1.260	3.689	2.203	2.571	2.013	3.918	1.899
	2	-1.101	-1.775	5.517	2.566	0.175	0.224	-0.800	-0.477	3.361	2.737	-1.006	-0.488
DEEPAKFERT	1	0.600	0.798	11.22	5.433	2.354	2.851	0.922	0.535	1.736	1.333	2.413	1.157
	2	-1.838	-2.540	8.763	4.218	-0.786	-1.011	0.539	0.311	-1.197	-1.026	1.432	0.680
ECLERX	1	0.040	0.036	6.281	2.312	2.820	3.076	1.784	0.898	4.423	2.880	2.105	0.815
	2	-2.510	-2.272	5.593	2.066	0.614	0.674	0.471	0.238	-0.501	-0.328	1.105	0.433
EDELWEISS	1	1.252	2.501	-3.950	-2.266	2.797	3.829	0.526	0.331	4.342	4.216	-0.159	-0.080
	2	-0.872	-1.775	0.461	0.264	0.645	0.914	-0.067	-0.042	0.609	0.629	-1.271	-0.636
EIDPARRY	1	0.861	1.028	7.929	3.847	3.563	3.568	1.543	0.858	3.869	2.756	1.437	0.615
	2	-2.267	-2.752	5.252	2.538	-0.920	-0.968	0.602	0.336	-0.954	-0.713	2.221	0.959
EIHLTD	1	2.035	1.991	1.970	0.880	1.823	1.698	0.740	0.364	0.567	0.345	0.428	0.149
	2	-2.079	-2.113	4.081	1.828	0.236	0.225	2.174	1.065	-0.694	-0.437	2.363	0.812
ELECTROSL	1	0.880	1.634	6.570	3.568	1.966	2.506	-1.530	-0.916	1.888	1.559	-0.596	-0.264
	2	-0.963	-1.827	5.454	2.948	-1.156	-1.571	-1.082	-0.654	-1.529	-1.388	-1.122	-0.507
ELGIEQUIP	1	3.631	2.737	1.728	0.567	0.979	1.031	-2.754	-1.052	0.009	0.008	-1.109	-0.323
	2	-1.768	-1.344	8.244	2.706	0.445	0.481	4.555	1.738	1.734	1.434	6.093	1.777
EMAMILTD	1	-0.451	-0.599	1.280	0.544	3.948	3.333	0.175	0.092	3.945	2.692	1.552	0.665
	2	-2.344	-3.111	4.428	1.886	0.174	0.145	2.499	1.316	0.740	0.499	1.608	0.687

clxx

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
ENGINEERSIN	1	-0.003	-0.006	6.830	3.850	2.486	2.500	-1.396	-0.943	2.765	1.959	-1.424	-0.714
	2	-0.972	-1.992	2.624	1.485	1.021	1.035	0.588	0.395	1.570	1.119	1.058	0.527
ESABINDIA	1	3.440	3.442	0.816	0.290	3.390	2.860	3.590	1.645	5.027	3.713	2.901	1.249
	2	-1.890	-1.928	1.698	0.604	0.475	0.416	2.966	1.370	0.185	0.141	3.324	1.452
EPL	1	1.149	1.599	3.558	1.448	2.509	1.997	0.161	0.073	3.499	2.243	2.577	1.026
	2	-0.004	-0.005	4.102	1.672	-1.469	-1.185	1.319	0.602	-0.994	-0.648	2.029	0.803
FDCLTD	1	2.499	2.400	9.235	3.931	2.410	2.033	-0.899	-0.499	2.651	1.491	-0.718	-0.295
	2	-1.190	-1.170	2.452	1.043	-2.044	-1.827	0.364	0.200	-3.852	-2.363	4.316	1.752
FINCABLES	1	0.928	0.839	7.494	3.034	1.730	1.574	-2.248	-1.209	0.479	0.286	-1.756	-0.724
	2	-3.156	-2.907	5.507	2.225	0.146	0.134	1.764	0.948	3.381	2.024	0.910	0.374
FINPIPE	1	1.682	1.466	3.316	1.355	-0.211	-0.518	-1.206	-0.609	3.678	2.418	0.214	0.090
	2	-1.375	-1.205	4.448	1.809	-0.194	-0.474	-3.371	-1.702	1.747	1.183	-3.167	-1.326
GABRIEL	1	1.310	1.809	7.760	4.067	0.306	0.309	-1.829	-0.972	0.760	0.637	-2.494	-1.166
	2	-4.448	-6.443	7.410	3.891	-2.401	-2.537	-0.112	-0.059	0.406	0.345	-2.410	-1.118
GHCLLTD	1	2.142	3.202	3.367	1.706	3.190	3.971	-2.341	-1.451	3.056	2.512	-4.859	-2.268
	2	-2.262	-3.534	7.490	3.838	-0.350	-0.456	0.520	0.326	-0.116	-0.100	-0.673	-0.324
GODREJIND	1	1.836	1.863	1.129	0.548	2.739	2.145	0.126	0.075	1.588	0.976	1.072	0.584
	2	-1.977	-2.019	0.729	0.358	-0.098	-0.078	-0.528	-0.315	0.312	0.191	0.534	0.290
GRAPHITE	1	0.477	0.656	6.657	2.831	2.195	3.228	-1.176	-0.797	2.596	2.366	-2.231	-1.164
	2	-3.160	-4.550	5.120	2.175	-0.388	-0.594	-0.769	-0.522	0.496	0.466	-1.865	-0.982
GESHIPPING	1	-0.535	-0.596	6.083	2.521	-0.328	-0.070	-0.281	-0.088	-0.328	-0.070	-0.281	-0.088
	2	0.848	0.944	6.476	2.681	6.800	1.468	2.225	0.711	6.800	1.468	2.225	0.711
GUJALKALI	1	1.334	1.636	8.122	4.032	1.956	1.977	-1.368	-0.744	2.815	2.004	-3.599	-1.635
	2	-2.911	-3.731	7.177	3.562	-1.675	-1.866	0.638	0.348	-0.330	-0.245	2.353	1.072
FLUOROCHEM	1	-0.467	-1.658	6.585	2.632	2.263	2.686	4.464	2.241	3.696	2.657	6.322	2.713
	2	0.006	0.024	5.964	2.396	-1.524	-1.826	-1.055	-0.528	-1.374	-0.974	-0.828	-0.352

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
GIPCL	1	0.148	0.133	8.961	3.842	0.593	0.412	8.755	3.999	5.502	3.062	-0.583	-0.245
	2	-3.145	-2.886	4.565	1.938	-4.285	-3.236	7.692	3.674	-0.848	-0.502	0.666	0.280
GMDCLTD	1	0.209	0.243	7.894	4.003	1.423	1.552	5.237	2.815	2.877	2.021	-1.591	-0.735
	2	-0.759	-0.893	1.027	0.515	-2.647	-3.159	9.530	5.262	0.404	0.294	2.870	1.346
GPPL	1	-1.284	-1.244	6.227	2.255	2.105	1.843	-6.904	-3.603	1.675	0.966	0.215	0.083
	2	-2.016	-1.950	7.299	2.650	-1.697	-1.504	-2.261	-1.174	-0.334	-0.193	0.814	0.317
GSFC	1	1.896	3.010	4.961	2.883	-2.012	-2.092	-4.181	-2.183	4.245	3.345	-1.410	-0.730
	2	-3.015	-5.090	7.993	4.728	-0.772	-0.807	-1.205	-0.635	2.661	2.149	-2.255	-1.171
GULFOILLUB	1	1.680	1.425	3.765	1.352	-0.080	-0.056	0.849	0.441	2.259	0.961	-1.401	-0.521
	2	-0.750	-0.640	-3.641	-1.306	1.528	1.101	0.363	0.187	-3.751	-1.639	-3.225	-1.198
HEG	1	0.684	1.190	4.812	2.366	0.677	0.860	6.571	3.660	2.146	1.893	-1.178	-0.577
	2	-3.590	-6.643	7.694	3.780	-2.392	-3.275	6.441	3.664	0.452	0.415	-0.069	-0.034
HIMACHLFUT	1	0.922	2.340	2.533	1.762	1.751	2.914	2.874	1.852	2.841	3.371	3.284	1.835
	2	-0.899	-2.392	0.039	0.027	-0.474	-0.830	2.016	1.293	0.630	0.755	0.576	0.320
HCC	1	0.478	1.310	-0.591	-0.401	2.901	4.785	2.622	1.709	2.538	2.976	3.931	2.238
	2	-0.932	-2.673	1.496	1.016	0.644	1.098	0.403	0.264	1.565	1.912	4.360	2.491
HINDCOPPER	1	-1.050	-1.368	10.84	5.529	-0.172	-0.218	6.129	3.288	4.085	3.562	-1.633	-0.876
	2	-5.148	-7.545	9.337	4.774	-3.582	-4.957	7.663	4.257	-0.506	-0.509	0.892	0.479
ICRA	1	3.553	1.761	3.501	1.042	3.520	1.721	1.426	0.485	9.704	3.041	-0.904	-0.249
	2	-1.029	-0.511	0.979	0.290	-2.277	-1.116	6.324	2.1384	1.149	0.353	1.924	0.529
IDEA	1	0.116	0.333	3.493	2.330	0.634	2.244	3.139	2.715	1.043	2.870	1.016	0.739
	2	-0.357	-1.021	3.394	2.269	-0.706	-2.505	2.940	2.553	-0.487	-1.391	1.842	1.295
IFBIND	1	1.692	2.222	4.066	1.630	1.729	1.760	7.671	3.654	3.527	3.025	1.503	0.665
	2	-1.454	-1.951	7.343	2.954	-2.868	-3.015	6.700	3.242	-1.059	-0.927	1.024	0.450
IFCI	1	0.002	0.004	4.306	2.640	0.866	1.504	4.584	3.201	2.512	3.724	0.058	0.041
	2	-1.960	-3.992	6.162	3.854	-1.379	-2.576	4.619	3.258	1.229	1.871	0.084	0.060

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
IIFL	1	1.843	-6.904	-1.410	-0.730	1.670	1.751	0.649	0.297	3.025	1.503	-3.015	-5.090
	2	-1.504	-2.261	-2.255	-1.171	-1.165	-1.231	-1.164	-0.535	-0.927	1.024	1.680	1.425
INDIACEM	1	0.375	0.735	3.293	1.902	1.996	2.477	6.061	4.025	4.362	3.709	-0.114	-0.067
	2	-1.482	-2.969	4.244	2.503	-0.718	-0.961	4.741	3.212	0.971	0.893	-0.186	-0.109
IOB	1	0.068	0.093	7.187	3.966	1.423	1.774	5.637	3.421	6.312	4.550	-1.509	-0.816
	2	-1.256	-1.749	3.936	2.172	-3.894	-5.332	7.323	4.558	-3.203	-2.446	2.858	1.555
IGL	1	-0.300	-0.943	4.775	2.775	-0.891	-0.829	5.480	3.323	-0.018	-0.015	1.125	0.695
	2	-0.153	-0.480	1.407	0.820	-2.029	-1.924	5.439	3.398	0.482	0.403	-1.199	-0.725
INGERRAND	1	1.242	1.471	4.919	2.439	4.809	3.218	1.910	0.948	7.615	2.205	-0.676	-0.270
	2	-0.981	-1.199	4.610	2.280	-1.009	-0.730	1.677	0.841	2.355	0.688	-5.077	-2.049
INOXLEISUR	1	0.535	0.587	8.716	3.804	0.971	1.111	4.572	2.540	1.753	1.589	-0.044	-0.021
	2	-0.417	-0.469	5.718	2.497	-0.316	-0.367	5.836	3.316	0.159	0.147	-1.682	-0.820
IPCALAB	1	1.701	1.972	4.809	2.355	0.147	0.252	3.735	2.480	0.224	0.169	2.677	1.514
	2	-1.360	-1.582	2.314	1.133	-1.475	-2.546	1.870	1.250	-4.500	-3.571	2.179	1.221
ITD	1	0.365	1.245	-1.932	-0.821	0.645	0.716	1.582	0.905	0.620	0.537	2.304	1.178
	2	0.202	0.682	-5.198	-2.212	-2.579	-3.078	1.295	0.740	-2.448	-2.422	1.091	0.559
JKIL	1	-0.056	-1.592	-1.630	-0.601	2.733	3.260	1.458	0.927	2.964	2.532	0.813	0.418
	2	-0.148	-4.210	-3.211	-1.185	1.891	2.309	4.891	3.125	3.712	3.176	0.914	0.474
JBCHEPHARM	1	2.971	3.201	4.755	2.171	2.746	2.395	4.178	2.282	2.377	1.582	2.732	1.263
	2	-0.031	-0.035	6.100	2.798	-0.875	-0.769	6.096	3.345	-1.003	-0.683	3.922	1.769
JINDALSAW	1	2.024	4.413	4.011	2.814	2.118	2.964	1.250	0.880	1.982	2.067	2.014	1.157
	2	-1.594	-3.683	3.485	2.446	0.258	0.383	3.291	2.310	0.975	1.075	4.915	2.854
JSL	1	0.270	0.568	-1.597	-0.836	2.889	2.359	-3.382	-2.361	2.733	2.185	-0.650	-0.449
	2	-1.698	-3.676	-2.841	-1.489	0.193	0.159	-0.879	-0.599	0.370	0.300	-0.426	-0.294
JKCEMENT	1	1.553	1.215	8.835	3.127	0.573	0.425	1.863	0.855	2.033	1.005	-1.081	-0.435
	2	-0.216	-0.171	4.459	1.565	-1.096	-0.813	3.422	1.575	1.887	0.961	-1.798	-0.710

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
JKLAKSHMI	1	0.872	0.843	6.747	2.717	4.524	3.743	1.374	0.678	5.597	3.483	3.423	1.525
	2	-3.419	-3.326	10.64	4.277	-0.65	-0.542	4.607	2.284	2.506	1.579	1.881	0.821
JKTYRE	1	-0.072	-0.270	8.593	5.925	0.736	0.725	6.159	3.144	3.011	2.300	0.369	0.172
	2	-0.099	-0.372	-0.680	-0.465	-3.851	-3.996	8.963	4.734	-1.874	-1.483	2.387	1.131
JMFINANCIL	1	0.647	0.991	8.457	4.058	-0.794	-0.681	7.893	3.514	1.559	1.034	2.757	1.096
	2	-1.934	-3.055	5.641	2.717	-2.139	-1.898	5.095	2.293	-0.777	-0.553	1.906	0.746
JSWHL	1	0.129	0.107	-1.138	-0.404	2.344	1.349	3.388	1.081	5.261	3.135	-3.093	-1.163
	2	-4.469	-3.782	7.130	2.550	-1.955	-1.136	6.129	1.992	3.701	2.179	-1.588	-0.593
JPPOWER	1	2.282	2.377	1.582	1.774	0.089	0.193	-0.930	0.033	0.077	-0.838	3.396	2.070
	2	3.345	-1.003	-0.683	0.884	2.186	1.637	1.881	-0.454	-1.038	3.085	1.385	1.940
JUBILANTPHARMA	1	-0.149	-0.254	6.657	3.631	2.076	2.358	2.824	1.594	3.673	3.388	0.742	0.397
	2	-1.714	-3.018	8.324	4.581	0.047	0.055	6.099	3.492	0.811	0.779	1.205	0.644
JUSTDIAL	1	-0.846	-2.013	4.453	2.971	-0.852	-1.213	3.884	2.342	0.793	1.063	0.201	0.132
	2	-1.443	-3.457	3.939	2.624	-1.859	-2.813	4.829	2.983	-0.004	-0.006	-1.912	-1.254
JYOTHYLAB	1	-0.528	-0.619	7.336	2.705	2.642	1.658	5.622	2.599	4.162	2.391	1.714	0.781
	2	0.275	0.323	0.836	0.310	-2.505	-1.580	4.202	1.934	-2.630	-1.531	0.802	0.363
KPRMILL	1	-0.035	-0.046	1.503	0.625	-0.080	-0.173	8.555	3.759	2.136	1.246	2.999	0.974
	2	0.459	0.601	4.279	1.774	0.089	0.193	-0.930	-0.406	1.601	0.920	0.884	0.288
KAJARIACER	1	0.489	0.607	2.168	0.884	2.186	1.637	1.881	0.933	3.516	1.971	0.836	0.355
	2	-0.982	-1.221	2.039	0.832	-1.278	-0.964	4.446	2.206	1.246	0.694	-0.132	-0.056
KPIL	1	2.160	2.042	6.126	2.232	-0.410	-0.315	8.038	3.678	1.520	1.092	-0.887	-0.390
	2	-1.092	-1.041	8.112	2.939	-0.812	-0.634	8.661	3.972	1.335	0.977	4.510	1.968
KANSAINER	1	0.283	0.766	0.132	0.048	-2.12	-1.462	-4.919	2.195	-0.262	-0.157	-3.515	-1.498
	2	-0.562	-1.516	-1.564	-0.569	1.491	0.987	2.558	1.151	3.360	2.006	-2.152	-0.924
KTKBANK	1	1.286	2.137	3.015	1.977	1.747	1.757	7.115	4.363	4.777	3.558	3.812	2.250
	2	-1.085	-1.840	4.034	2.685	-0.464	-0.497	6.492	4.081	2.858	2.332	0.281	0.162

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
KARURVYSYA	1	-0.162	-0.459	2.145	1.140	0.496	0.550	5.684	3.110	3.079	2.930	0.777	0.418
	2	-0.164	-0.466	2.590	1.375	-2.327	-2.702	5.985	3.353	-0.716	-0.681	1.127	0.609
KSCL	1	-0.958	-1.492	5.986	3.194	-0.248	-0.246	7.515	4.444	0.899	0.705	1.714	0.861
	2	-1.574	-2.465	5.916	3.153	-3.359	-3.433	5.798	3.430	-1.103	-0.899	0.021	0.010
KEC	1	1.074	1.481	3.737	1.856	3.680	3.037	1.041	0.517	4.741	3.468	-1.357	-0.680
	2	0.369	0.514	3.127	1.562	2.551	2.103	1.615	0.811	1.734	1.278	0.082	0.040
KNRCON	1	0.033	0.077	-0.838	-0.341	1.316	1.746	2.538	1.280	5.557	3.327	2.054	0.878
	2	-0.454	-1.038	3.085	1.257	-0.269	-0.361	3.624	1.826	1.075	0.650	-0.084	-0.036
KSB	1	1.663	1.326	6.475	2.363	-0.357	-0.239	8.569	3.396	2.070	1.168	0.855	0.320
	2	-1.820	-1.493	5.425	1.987	0.216	0.144	3.477	1.385	1.940	1.111	-1.354	-0.505
LMW	1	-0.007	-0.175	3.158	1.342	1.883	1.517	-0.574	-0.283	2.553	1.585	-3.687	-1.605
	2	-0.108	-2.478	-1.732	-0.737	-1.255	-1.024	1.610	0.800	-0.273	-0.169	-2.643	-1.151
POONAWALLA	1	0.790	0.946	8.768	3.258	4.014	4.212	5.145	2.16	5.899	4.541	1.913	0.765
	2	-2.135	-2.568	5.969	2.220	0.024	0.026	-0.180	-0.076	-0.487	-0.376	6.090	2.437
MAHSEAMLES	1	-0.015	-0.405	-1.143	-0.445	5.123	3.714	2.990	1.279	7.036	4.291	0.023	0.009
	2	-0.151	-3.874	5.206	2.040	-1.298	-0.949	5.936	2.551	0.951	0.583	3.821	1.529
MHRIL	1	0.445	0.511	6.774	3.033	1.759	1.646	5.700	2.517	3.638	2.288	-0.040	-0.015
	2	-2.928	-3.433	2.720	1.219	-2.469	-2.388	7.162	3.23	1.119	0.722	-0.819	-0.324
MAHLIFE	1	1.280	1.047	7.859	3.014	0.029	0.049	6.992	3.226	4.366	2.296	-0.119	-0.047
	2	-1.360	-1.122	7.080	2.713	-0.266	-0.45	9.088	4.17	4.524	2.334	1.836	0.727
MARKSANS	1	-0.541	5.757	1.927	2.091	2.431	3.558	5.002	3.085	4.703	5.330	-0.094	-0.051
	2	3.511	0.593	0.330	2.673	-0.847	-1.285	7.177	4.535	1.854	2.150	2.125	1.146
PGHL	1	2.122	2.795	5.110	2.808	0.202	0.146	4.325	2.408	2.498	1.646	0.780	0.425
	2	0.414	0.568	1.954	1.078	-0.348	-0.246	1.281	0.724	0.544	0.363	-0.370	-0.200
NAVA	1	-0.386	-0.561	8.869	3.571	-0.296	-0.324	6.955	3.492	1.565	1.259	0.843	0.356
	2	-1.647	-2.460	6.880	2.760	-2.665	-3.125	7.428	3.773	-0.995	-0.837	-0.339	-0.144

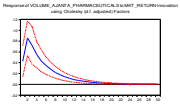
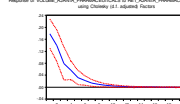
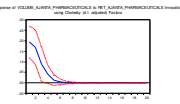
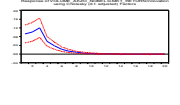
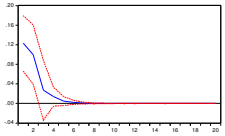
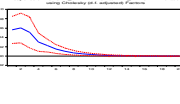
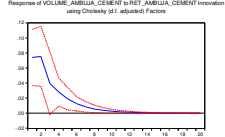
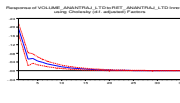
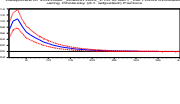
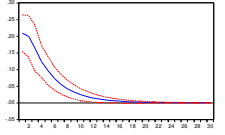
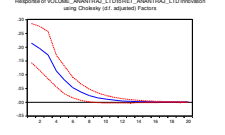
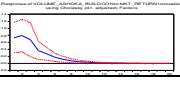
Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
NCC	1	0.396	0.876	2.031	1.147	-0.233	-0.388	4.55	3.167	0.856	1.497	0.728	0.601
	2	-1.300	-2.968	4.722	2.696	-0.667	-1.143	2.590	1.833	0.440	0.802	-1.401	-1.146
NCL	1	0.244	0.254	7.927	3.571	0.397	0.393	7.105	4.167	2.172	1.528	-2.417	-1.254
	2	-4.347	-4.688	5.048	2.259	-1.399	-1.421	6.877	4.044	2.152	1.525	-2.841	-1.459
NHPC	1	-0.477	-0.525	3.404	1.911	-2.162	-1.79	7.296	4.050	-2.298	-1.437	-2.231	-1.077
	2	-2.047	-2.267	7.311	4.119	-1.401	-1.187	5.485	3.067	-1.752	-1.114	-2.013	-0.963
NIITLTD	1	0.445	0.564	3.872	1.899	-0.208	-0.259	5.340	2.948	1.183	1.214	0.023	0.012
	2	-3.381	-4.398	4.665	2.294	-0.237	-0.303	4.210	2.333	0.711	0.750	2.265	1.144
NMDC	1	1.475	2.212	2.695	1.658	0.553	0.709	4.731	3.111	1.656	1.710	-0.963	-0.613
	2	0.327	0.492	2.790	1.716	-0.438	-0.575	4.165	2.745	1.238	1.348	-1.289	-0.818
RCF	1	0.872	1.305	6.597	3.663	1.973	1.635	2.006	0.879	2.643	2.297	-1.122	-0.619
	2	-3.813	-6.366	9.246	5.219	-2.05	-1.872	6.670	3.000	1.356	1.303	0.924	0.511
RATNAMANI	1	2.468	1.842	5.717	1.929	1.640	0.917	2.77	1.107	3.744	1.756	-2.265	-0.895
	2	-0.469	-0.355	-1.588	-0.532	2.443	1.38	2.655	1.075	4.797	2.294	-1.883	-0.723
RAYMOND	1	-0.756	-1.028	7.863	4.096	1.99	2.045	7.04	3.862	4.706	3.657	2.354	1.249
	2	-3.274	-4.649	8.304	4.366	0.375	0.401	5.107	2.925	1.978	1.599	-0.558	-0.295
REDINGTON	1	0.497	0.506	2.633	0.985	-0.225	-0.337	5.603	2.787	1.317	1.036	-0.938	-0.413
	2	-0.210	-0.216	-1.289	-0.484	-1.520	-2.350	2.35	1.194	-0.282	-0.236	0.879	0.378
SANOFI	1	-0.956	-0.480	-7.027	-2.135	-1.565	-0.896	2.444	1.363	0.989	0.435	1.229	0.591
	2	-1.516	-0.761	5.046	1.522	-2.788	-1.602	5.280	2.985	0.865	0.388	0.858	0.408
SCI	1	1.304	2.193	6.553	3.783	0.296	0.322	5.079	2.845	1.433	1.151	2.082	1.071
	2	-2.534	-4.668	8.339	4.916	-2.806	-3.34	8.306	4.831	-1.641	-1.458	5.349	2.737
SRTRANS	1	-1.586	-2.413	3.299	1.826	-0.860	-1.451	3.410	2.188	-0.226	-0.357	1.332	0.801
	2	-0.887	-1.350	-1.091	-0.607	-1.146	-1.949	5.768	3.726	0.534	0.839	0.456	0.273
SIMPLEXINF	1	2.273	2.969	6.918	2.620	3.821	4.213	4.444	2.163	5.093	3.393	-3.003	-1.152
	2	-1.107	-1.453	3.052	1.151	0.520	0.567	5.789	2.788	0.966	0.639	-0.052	-0.019

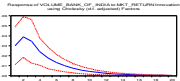
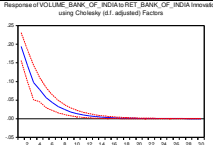
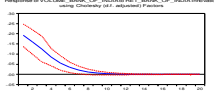
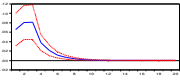
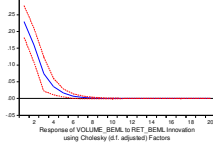
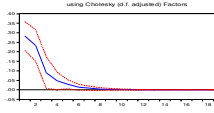
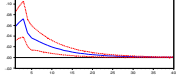
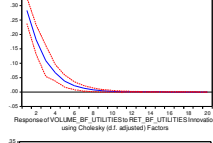
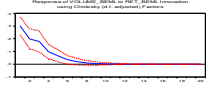
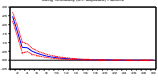
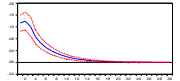
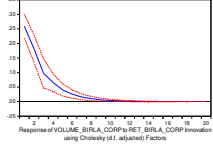
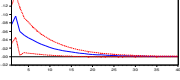
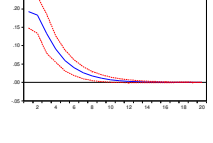
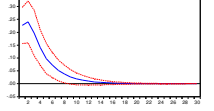
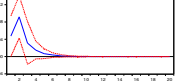
Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
SKFINDIA	1	-3.216	-1.446	8.716	2.401	1.656	0.873	2.604	0.882	4.494	1.589	-4.513	-1.241
	2	-1.575	-0.711	2.517	0.691	-1.026	-0.541	5.757	1.927	2.091	0.728	5.398	1.492
SONATASOFTW	1	2.970	4.738	-2.648	-1.596	3.605	3.511	0.593	0.330	2.673	1.804	1.448	0.687
	2	-0.106	-0.173	1.925	1.160	-0.033	-0.033	0.950	0.527	0.512	0.348	1.840	0.874
SUNTV	1	-1.68E	-4.957	4.69E	4.452	-5.431	-4.993	5.743	3.180	2.573	0.277	-2.291	-1.650
	2	7.08E	2.090	-2.88E	-2.742	-3.223	-2.988	7.914	0.443	8.004	0.870	2.842	2.021
SUNDRMFAST	1	0.725	0.807	6.303	2.984	1.942	1.559	2.920	1.399	1.900	1.375	1.772	0.843
	2	-1.656	-1.893	4.905	2.318	-1.826	-1.486	1.294	0.624	-2.191	-1.603	-0.457	-0.212
SPLPETRO	1	0.757	0.845	3.054	1.282	2.650	2.421	3.775	1.751	5.298	3.418	2.171	0.886
	2	-2.024	-2.304	7.516	3.153	-0.887	-0.830	2.228	1.044	-0.257	-0.171	1.772	0.728
TATACHEM	1	0.245	0.253	8.546	4.587	0.612	1.225	3.998	2.744	0.910	1.566	-1.236	-0.700
	2	-1.356	-1.421	4.428	2.403	0.824	1.661	4.083	2.830	1.274	2.196	0.458	0.255
TDPOWERSYS	1	1.618	1.500	2.765	0.870	2.912	2.970	5.373	2.231	2.468	1.471	-2.335	-0.768
	2	-2.544	-2.255	3.633	1.203	-0.360	-0.350	2.140	0.949	1.771	1.072	-4.128	-1.348
RAMCOCEM	1	-1.775	-1.442	3.021	1.163	2.815	2.243	-1.740	-0.924	1.189	0.904	-2.102	-1.233
	2	-2.531	-2.067	-1.544	-0.598	-0.093	-0.073	2.229	1.184	0.685	0.521	1.689	0.969
THERMAX	1	-2.522	-1.719	9.623	3.138	3.341	1.918	-2.199	-0.876	-1.417	-0.435	-0.610	-0.196
	2	-2.897	-1.979	9.219	2.997	2.741	1.590	0.447	0.178	-1.773	-0.527	-4.110	-1.322
TTKPRESTIG	1	0.058	0.057	4.189	1.878	-0.019	-0.056	5.610	2.364	3.274	1.685	-7.063	-2.766
	2	-0.005	-0.005	6.350	2.831	-0.179	-0.518	3.513	1.492	3.013	1.565	-5.445	-2.118
UCOBANK	1	-0.485	-0.835	5.891	3.471	1.986	1.731	3.874	2.248	3.736	2.625	0.754	0.394
	2	-2.884	-5.134	7.004	4.140	-3.890	-3.875	5.663	3.388	-1.255	-0.975	1.954	1.042
USHAMART	1	0.618	1.192	10.44	5.162	0.899	1.128	5.527	2.885	1.778	1.575	2.646	1.197
	2	-0.938	-1.874	4.858	2.374	-2.172	-2.871	9.250	4.922	0.367	0.320	2.811	1.267
WABAG	1	0.794	1.455	0.741	0.387	5.120	6.498	0.843	0.503	5.839	5.356	-1.218	-0.558
	2	-1.308	-2.410	-1.247	-0.651	-0.290	-0.378	1.511	0.905	0.798	0.743	-1.879	-0.878

Symbol	Lag	DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
VTL	1	2.452	1.857	0.170	0.061	-0.162	-0.353	8.525	3.779	4.442	1.931	4.119	1.469
	2	-1.028	-0.779	2.224	0.805	-0.365	-0.797	8.263	3.705	3.563	1.534	2.279	0.809
VESUVIUS	1	-0.034	-0.022	2.658	0.837	3.303	1.731	4.664	1.626	7.032	2.850	1.579	0.482
	2	-2.292	-1.479	4.713	1.483	-4.446	-2.354	9.257	3.222	1.128	0.460	3.517	1.093
VINATORGA	1	2.343	2.666	3.632	1.679	0.454	0.674	3.728	2.174	0.806	1.104	1.545	0.757
	2	-0.131	-0.150	3.015	1.390	0.618	0.919	2.464	1.474	1.326	1.807	-0.184	-0.093
VSTIND	1	-0.235	-0.158	0.069	0.022	1.399	0.731	2.435	1.110	2.840	1.203	4.779	1.813
	2	-3.995	-2.699	5.811	1.891	1.744	0.920	2.211	1.011	2.203	0.941	-0.286	-0.108
WABCO	1	-2.121	-1.745	5.155	2.099	0.777	0.383	3.948	1.553	1.280	0.429	-1.096	-0.366
	2	-3.465	-2.868	2.347	0.952	-2.223	-1.109	2.294	0.891	0.202	0.069	-2.137	-0.718
WELCORP	1	1.471	2.386	7.080	3.329	0.321	0.512	3.211	1.988	3.100	3.081	-3.915	-2.147
	2	-1.639	-2.737	6.626	3.138	-0.469	-0.749	4.991	3.160	2.535	2.583	0.727	0.394
WELSPUNLIV	1	0.086	0.308	3.958	1.831	0.287	0.165	2.401	3.189	3.243	3.307	1.836	0.898
	2	-0.959	-3.416	0.858	0.396	0.805	0.461	0.544	0.764	2.349	2.545	0.284	0.136
WHIRLPOOL	1	1.872	1.811	-0.267	-0.115	-0.107	-0.089	-1.241	-0.695	2.921	2.123	0.151	0.080
	2	0.260	0.253	3.046	1.316	0.083	0.069	0.944	0.529	3.156	2.390	1.105	0.573
WOCKPHARMA	1	0.919	2.165	5.562	4.056	1.402	1.853	6.429	3.897	3.608	3.402	-2.837	-1.494
	2	0.175	0.430	1.616	1.187	-0.864	-1.214	5.872	3.671	0.424	0.420	-2.112	-1.098
ZEEL	1	-1.472	-2.449	0.485	0.295	0.342	0.727	3.056	2.433	0.238	0.384	1.370	0.957
	2	-1.080	-1.795	1.360	0.833	-0.854	-1.876	5.080	4.083	0.579	0.934	1.518	1.077
ZENSARTECH	1	-0.058	-0.146	6.708	2.981	1.193	1.083	1.498	0.629	3.144	2.124	-1.805	-0.663
	2	-0.701	-1.769	5.750	2.567	-2.682	-2.529	3.337	1.418	-0.688	-0.472	0.416	0.154
ZYDUSWELL	1	-0.350	-0.309	2.957	1.266	1.468	0.819	4.759	2.213	4.512	1.988	-0.903	-0.351
	2	-1.902	-1.723	5.616	2.431	-4.876	-2.743	4.949	2.325	-3.761	-1.653	1.730	0.688

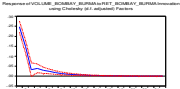
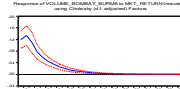
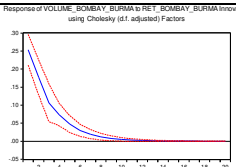
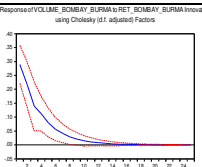
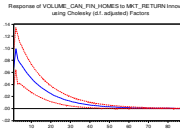
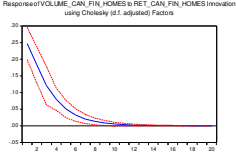
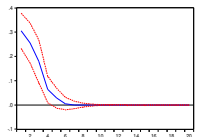
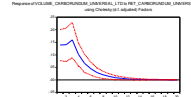
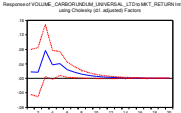
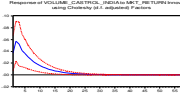
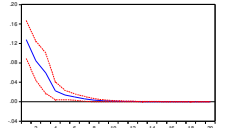
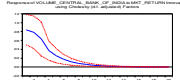
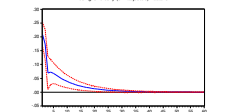
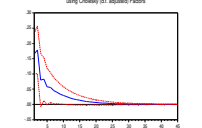
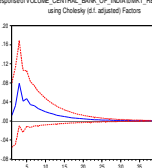
Appendix VIII

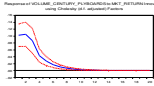
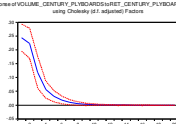
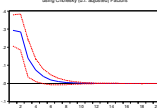
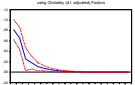
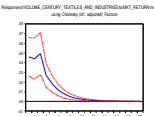
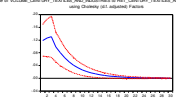
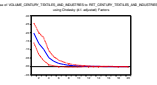
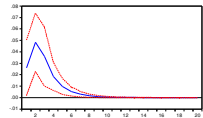
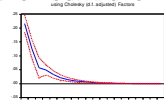
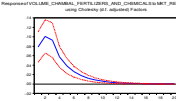
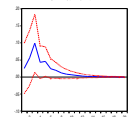
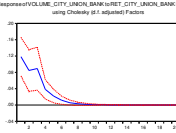
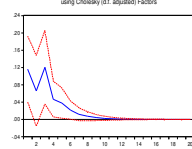
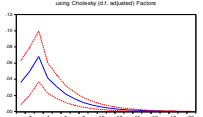
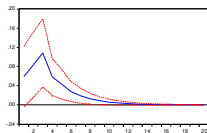
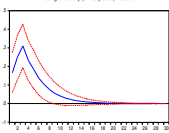
IRF Figures of Mid-Cap Stocks Over White swan, Grey Swan, and Black Swan Phases

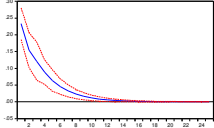
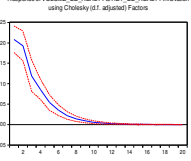
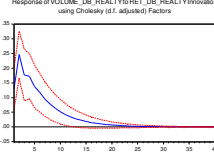
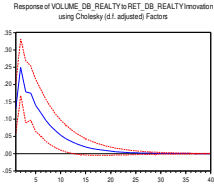
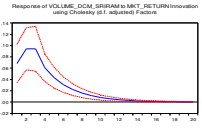
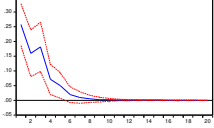
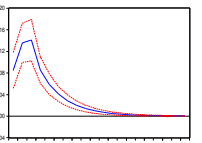
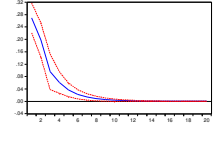
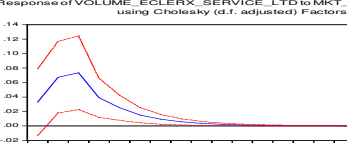
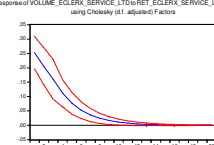
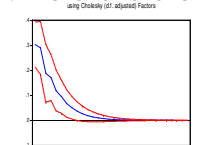
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
1	AJANTAPHARM	No Effect			No Effect		No Effect
2	AKZOINDIA	No Effect			No Effect	No Effect	No Effect
3	APLLTD	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
4	ARE&M	No Effect		No Effect	No Effect	No Effect	No Effect
5	AMBUJACEM	No Effect	No Effect		No Effect	No Effect	No Effect
6	ANANTRAJ				No Effect		No Effect
7	ASAHIINDIA	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
8	ASHOKA	No Effect		No Effect	No Effect	No Effect	No Effect

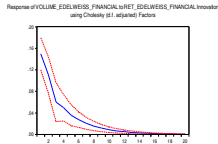
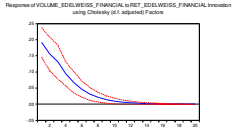
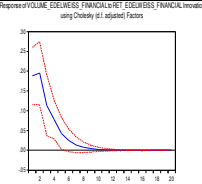
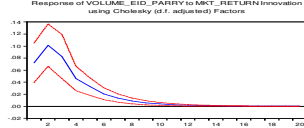
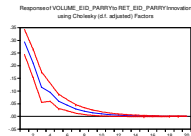
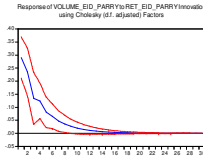
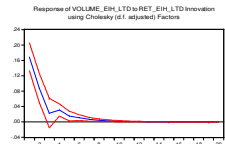
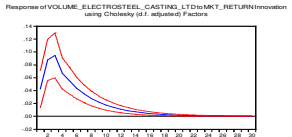
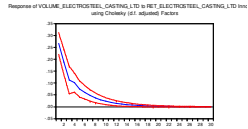
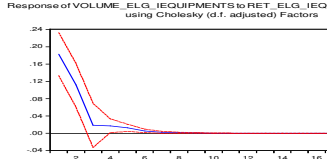
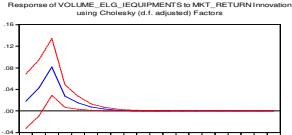
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
9	BANKINDIA	No Effect			No Effect		No Effect
10	BASF	No Effect			No Effect		No Effect
11	BEML	No Effect			No Effect		No Effect
12	BFUTILITIE				No Effect	No Effect	No Effect
13	BIRLACORPN	No Effect			No Effect		No Effect
14	BLUEDART	No Effect		No Effect	No Effect	No Effect	No Effect

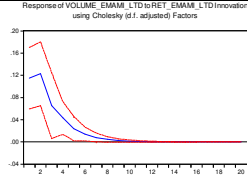
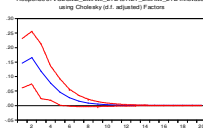
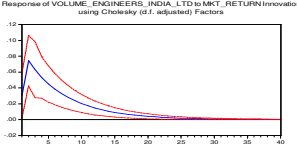
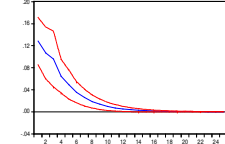
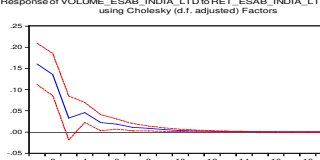
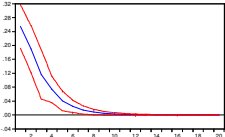
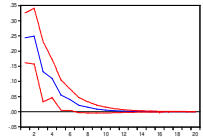
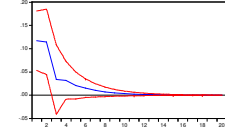
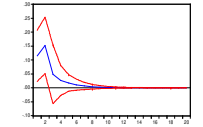
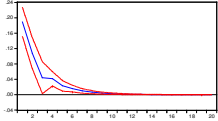
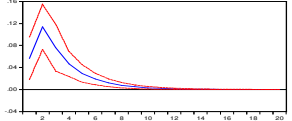
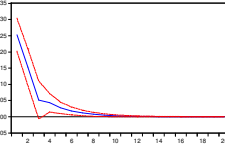
clxxx

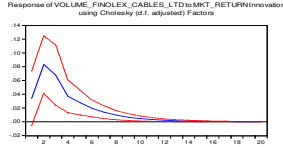
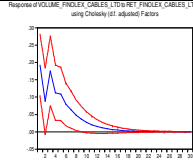
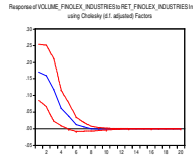
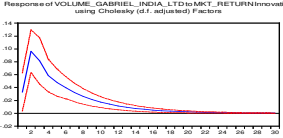
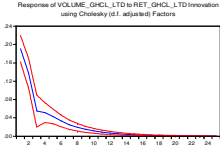
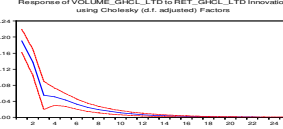
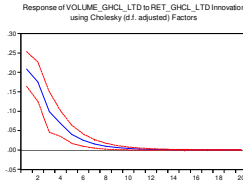
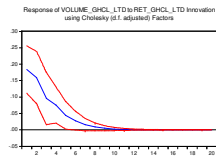
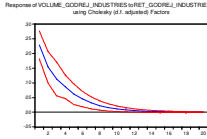
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
15	BPTC				No Effect		No Effect
16	BRIGADE	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
17	CANFINHOM E	No Effect			No Effect		No Effect
18	CARBORUNI V	No Effect	No Effect			No Effect	No Effect
19	CASTROL	No Effect			No Effect	No Effect	No Effect
20	CENTRALBK	No Effect			No Effect		

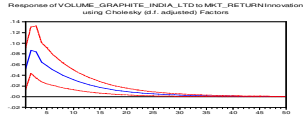
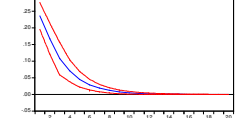
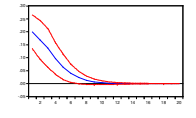
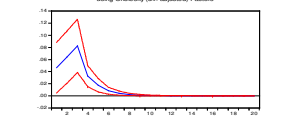
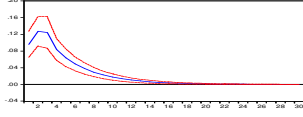
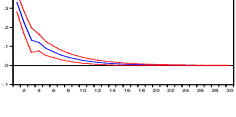
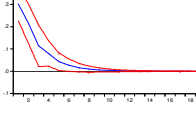
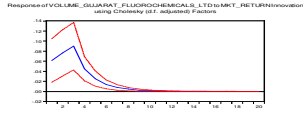
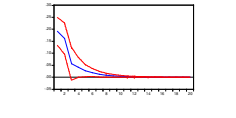
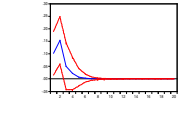
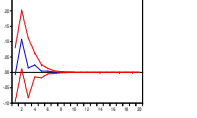
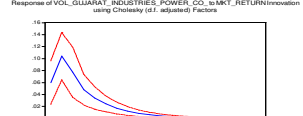
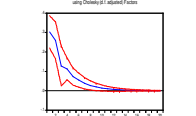
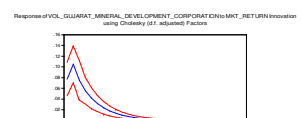
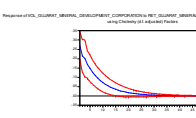
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
2 1	CENTURYPLY	No Effect			No Effect		No Effect
2 2	ABREL				No Effect		No Effect
2 3	CESSC	No Effect		No Effect	No Effect	No Effect	No Effect
2 4	CHAMBLFER T			No Effect	No Effect	No Effect	
2 5	CUB	No Effect	No Effect		No Effect		No Effect
2 6	CROMPTON	No Effect			No Effect		No Effect

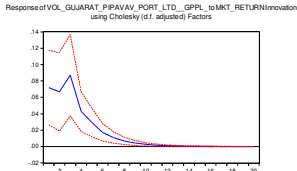
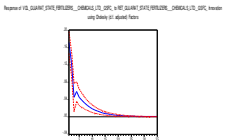
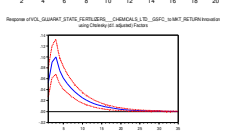
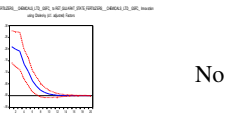
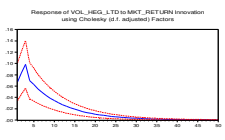
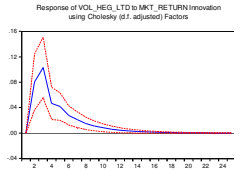
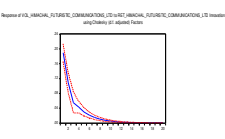
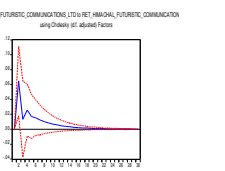
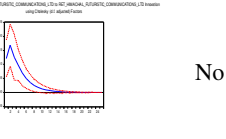
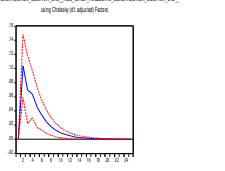
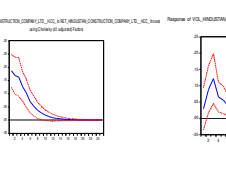
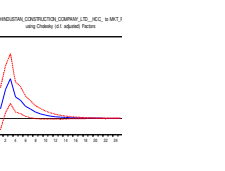
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
27	CYIENT	No Effect	No Effect		No Effect	No Effect	No Effect
28	DBREALTY		No Effect		No Effect		No Effect
29	DCMSHRIRAM	No Effect		No Effect	No Effect		No Effect
30	DEEPAKFERT	No Effect			No Effect	No Effect	No Effect
31	ECLERX	No Effect			No Effect		No Effect

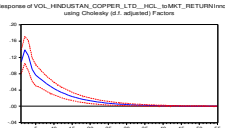
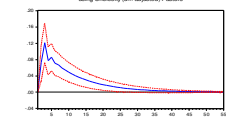
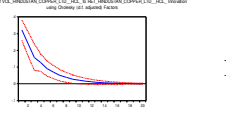
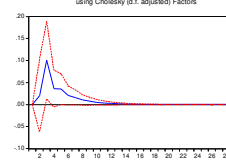
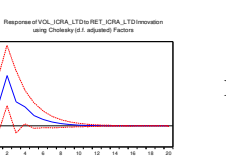
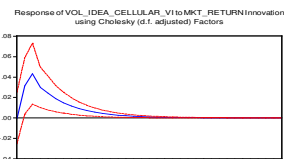
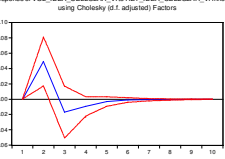
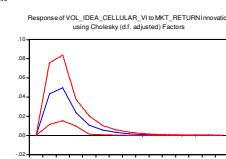
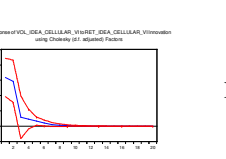
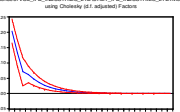
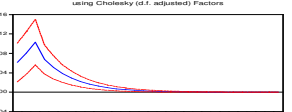
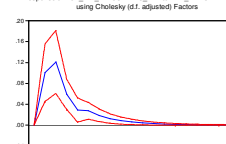
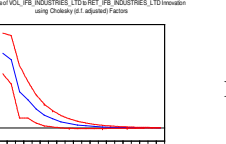
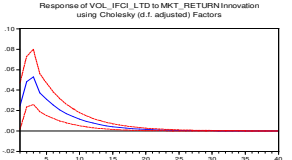
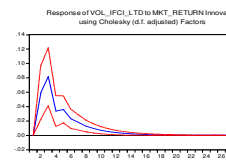
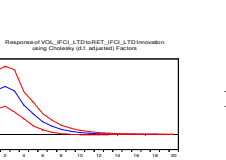
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
3 2	EDELWEISS		No Effect		No Effect		No Effect
3 3	EIDPARRY	No Effect			No Effect		No Effect
3 4	EIHLTD		No Effect	No Effect	No Effect	No Effect	No Effect
3 5	ELECTROSL	No Effect			No Effect	No Effect	No Effect
3 6	ELGIEQUIP			No Effect	No Effect	No Effect	No Effect

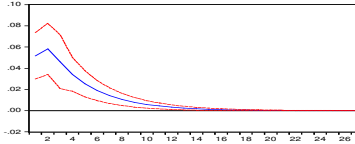
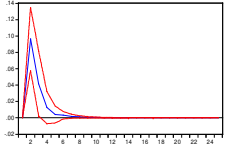
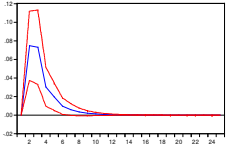
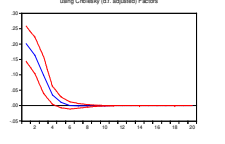
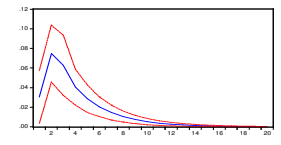
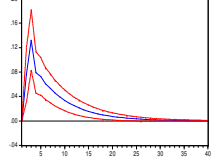
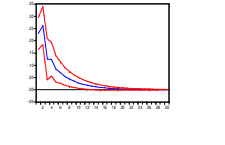
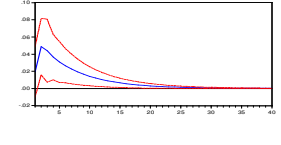
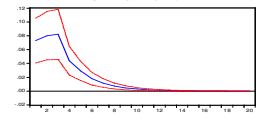
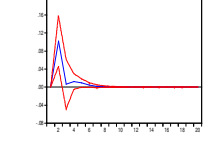
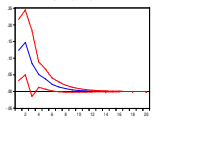
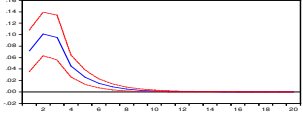
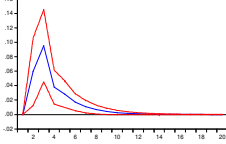
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
37	EMAMILTD	No Effect	No Effect		No Effect		No Effect
38	ENGINEERSIN	No Effect			No Effect	No Effect	No Effect
39	ESABINDIA		No Effect		No Effect		No Effect
40	EPL	No Effect	No Effect		No Effect		No Effect
41	FDCLTD				No Effect	No Effect	No Effect

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
4 2	FINCABLES	No Effect		No Effect	No Effect		No Effect
4 3	FINPIPE	No Effect	No Effect	No Effect	No Effect		No Effect
4 4	GABRIEL	No Effect		No Effect	No Effect	No Effect	No Effect
4 5	GHCLLTD				No Effect		No Effect
4 6	GODREJIND	No Effect	No Effect		No Effect	No Effect	No Effect

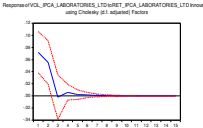
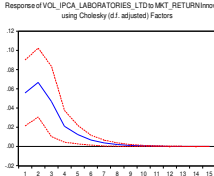
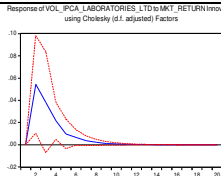
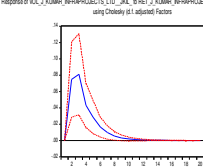
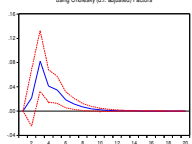
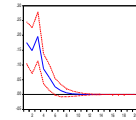
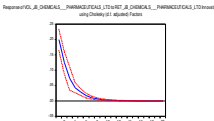
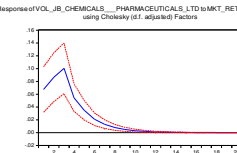
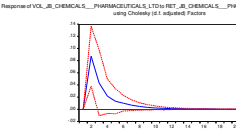
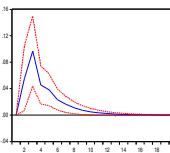
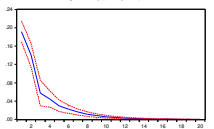
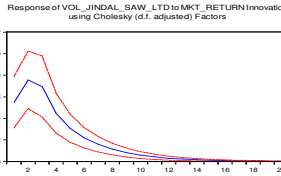
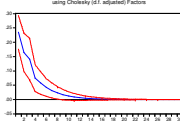
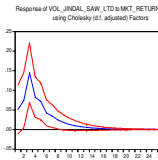
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
47	GRAPHITE	No Effect			No Effect		No Effect
48	GESHIPPING	No Effect		No Effect	No Effect	No Effect	No Effect
49	GUJALKALI	No Effect			No Effect		No Effect
50	FLUOROCHEM	No Effect			No Effect		
51	GIPCL	No Effect		No Effect			No Effect
52	GMDCLTD	No Effect		No Effect			No Effect

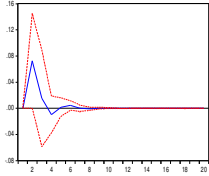
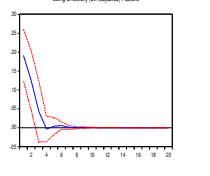
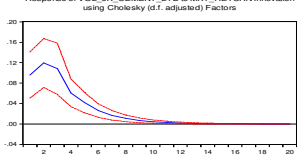
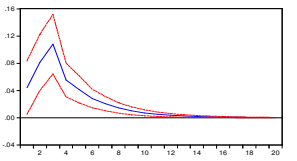
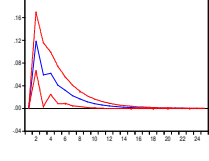
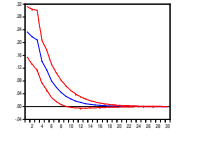
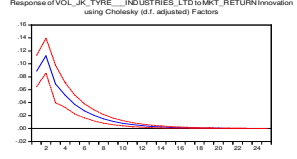
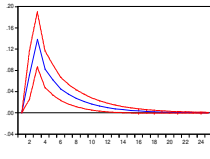
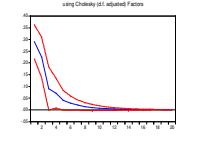
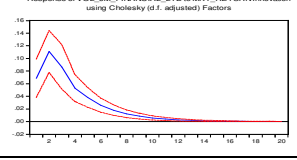
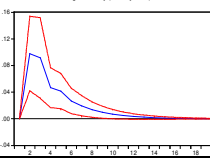
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
53	GPPL	No Effect		No Effect	No Effect	No Effect	No Effect
54	GSFC			No Effect	No Effect		No Effect
55	GULFOILLUB	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
56	HEG	No Effect		No Effect		No Effect	No Effect
57	HIMACHLFUT		No Effect		No Effect		No Effect
58	HCC	No Effect	No Effect		No Effect		

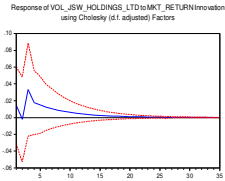
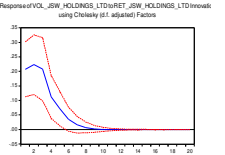
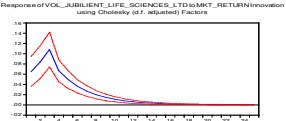
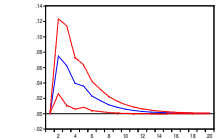
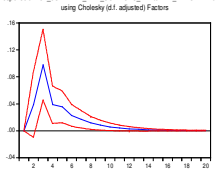
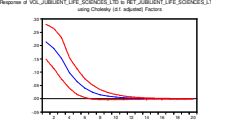
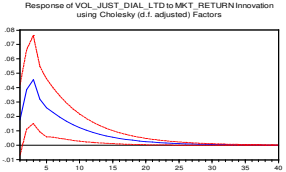
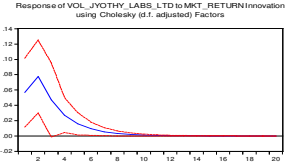
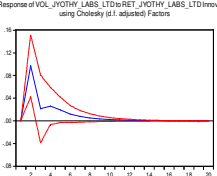
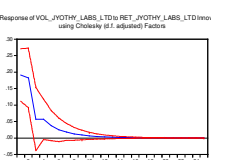
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
59	HINDCOPPER	No Effect		No Effect			No Effect
60	ICRA	No Effect	No Effect	No Effect			No Effect
61	IDEA	No Effect					No Effect
62	IFBIND			No Effect			No Effect
63	IFCI	No Effect		No Effect			No Effect
64	IIFL	No Effect	No Effect	No effect	No effect	No Effect	No Effect

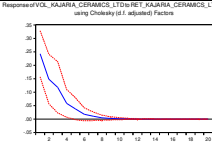
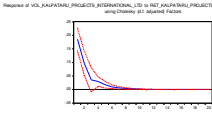
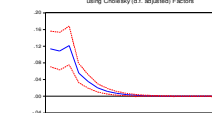
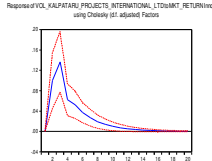
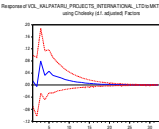
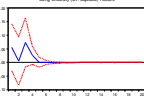
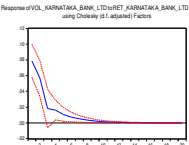
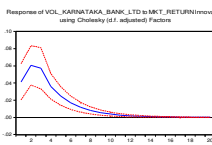
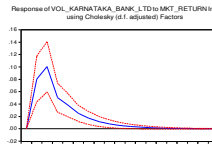
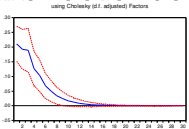
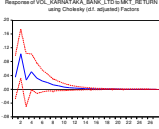
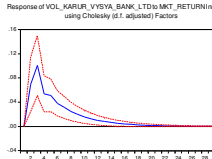
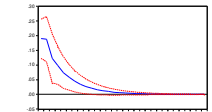
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
65	INDIACEM	No Effect					No Effect
66	IOB	No Effect		No Effect			No Effect
67	IGL	No Effect		No Effect	No Effect	No Effect	No Effect
68	INGERRAND	No Effect			No Effect		No Effect
69	INOXLEISUR	No Effect		No Effect		No Effect	No Effect

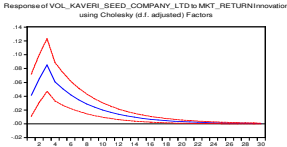
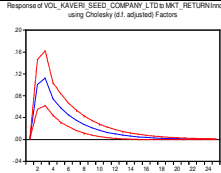
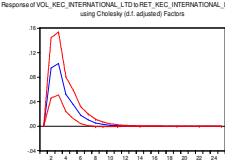
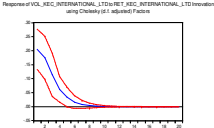
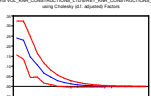
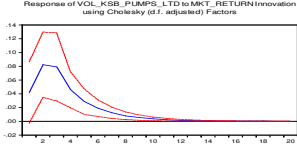
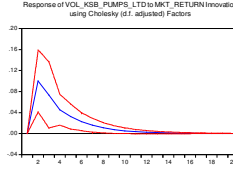
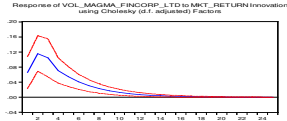
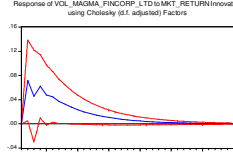
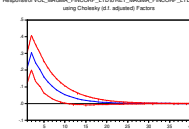
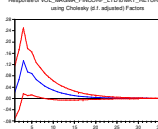
CXC

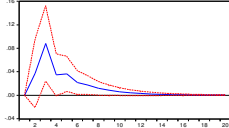
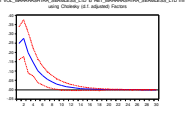
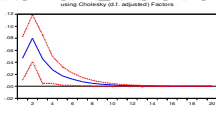
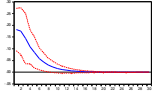
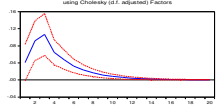
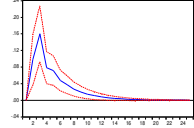
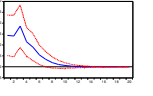
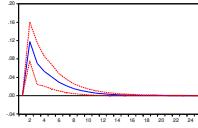
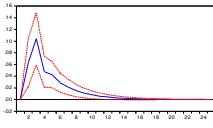
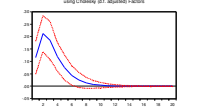
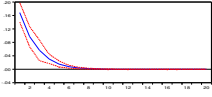
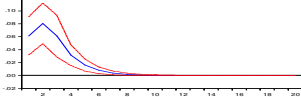
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
70	IPCALAB			No Effect		No Effect	No Effect
71	ITD	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
72	JKIL	No Effect	No Effect				No Effect
73	JBCHEPHARM					No Effect	No Effect
74	JINDALSAW			No Effect	No Effect		

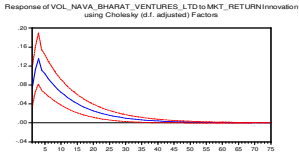
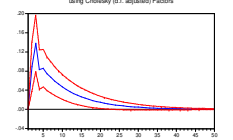
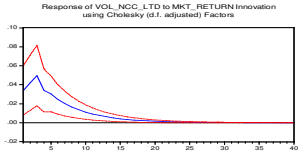
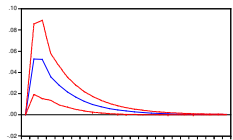
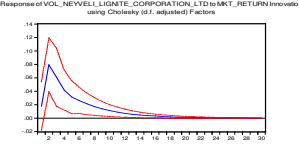
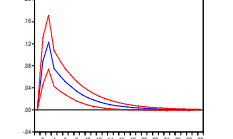
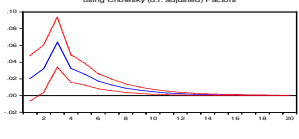
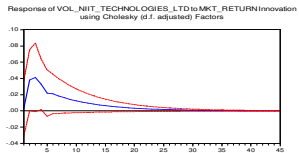
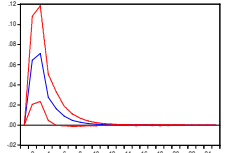
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
75	JSL	No Effect	No Effect	Response of VOL_JINDAL_STAINLESS_LTD to RET_JINDAL_STAINLESS_LTD innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_JINDAL_STAINLESS_LTD to RET_JINDAL_STAINLESS_LTD innovation using Cholesky (d.f. adjusted) Factors 	No Effect
76	JKCEMENT	No Effect	Response of VOL_JK_CEMENT_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No Effect	No Effect	No Effect
77	JKLAKSHMI	No Effect	Response of VOL_JK_LAKSHMI_CEMENT_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JK_LAKSHMI_CEMENT_LTD to RET_JK_LAKSHMI_CEMENT_LTD innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_JK_LAKSHMI_CEMENT_LTD to RET_JK_LAKSHMI_CEMENT_LTD innovation using Cholesky (d.f. adjusted) Factors 	No Effect
78	JKTYRE	No Effect	Response of VOL_JK_TYRE_INDUSTRIES_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_JK_TYRE_INDUSTRIES_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JK_TYRE_INDUSTRIES_LTD to RET_JK_TYRE_INDUSTRIES_LTD innovation using Cholesky (d.f. adjusted) Factors 	No Effect
79	JMFINANCIL	No Effect	Response of VOL_JM_FINANCIAL_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_JM_FINANCIAL_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No Effect

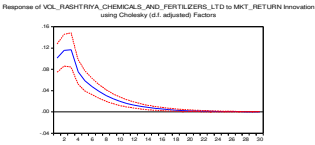
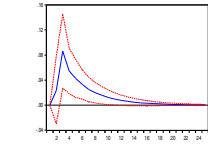
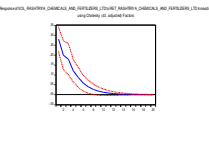
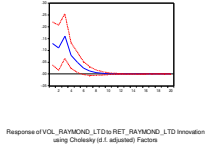
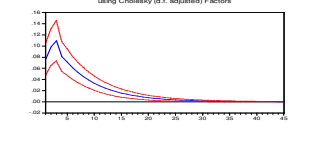
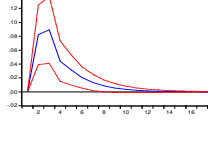
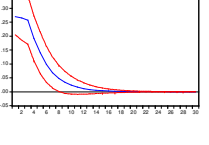
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
80	JSWHL	No Effect		No Effect	No Effect		No Effect
81	JPPOWER	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
82	JUBILANTPHARMA	No Effect					No Effect
83	JUSTDIAL	No Effect		No Effect	No Effect	No Effect	No Effect
84	JYOTHYLAB	No Effect		No effect			No Effect
85	KPRMILL	No Effect	No Effect	No Effect	No effect	No Effect	No Effect

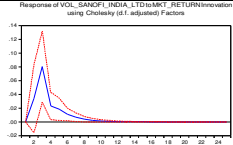
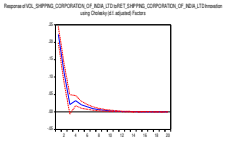
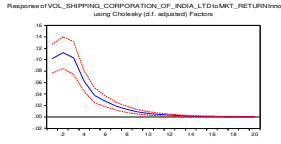
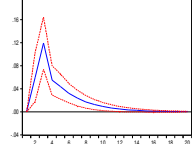
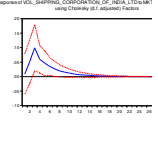
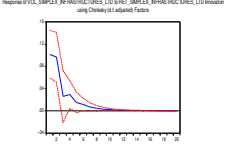
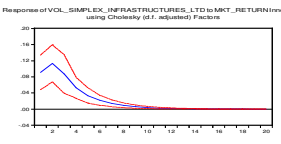
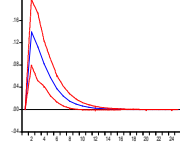
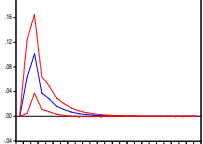
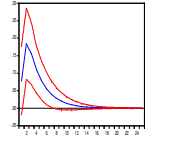
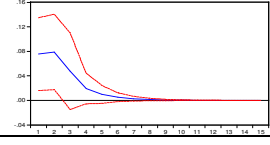
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
86	KAJARIACER	No Effect	No Effect	No Effect	No Effect		No Effect
87	KPIL			No effect		No Effect	
88	KANSAINER	No Effect	No Effect	No effect	No effect		No Effect
89	KTKBANK			No effect			
90	KARURVYSYA	No Effect	No Effect	No effect			No Effect

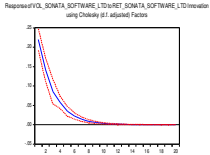
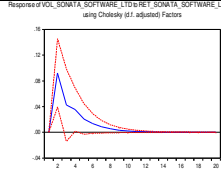
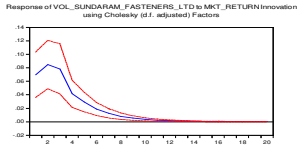
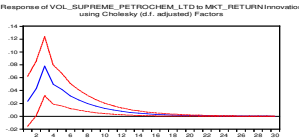
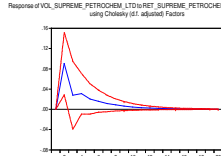
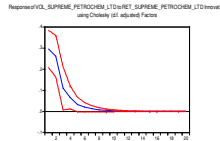
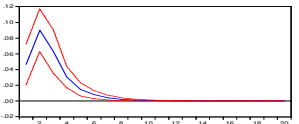
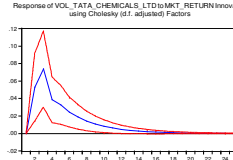
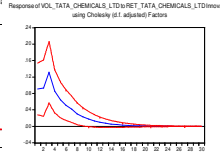
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
9 1	KSCL	No Effect		No effect		No Effect	No Effect
9 2	KEC	No Effect	No Effect		No Effect		No Effect
9 3	KNRCON	No Effect	No Effect	No effect	No effect		No Effect
9 4	KSB	No Effect		No effect		No Effect	No Effect
9 5	LMW	No Effect	No Effect	No effect	No effect	No Effect	No Effect
9 6	POONAWALLA	No Effect		No effect			

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
97	MAHSEAMLS	No Effect	No Effect	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MAHARASHTRA_SEAMLESS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect
98	MHRIL	No Effect	Response of VOL_MAHARASHTRA_HOLIDAYS_RESORTS_INDIA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	Response of VOL_MAHARASHTRA_HOLIDAYS_RESORTS_INDIA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect
99	MAHLIFE	No Effect	Response of VOL_MAHARASHTRA_LIFESPACES_DEVELOPERS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MAHARASHTRA_LIFESPACES_DEVELOPERS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MAHARASHTRA_LIFESPACES_DEVELOPERS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect
100	MARKSANS	No Effect	No Effect	Response of VOL_MARKSANS_PHARMA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MARKSANS_PHARMA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MARKSANS_PHARMA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect
101	PGHL	Response of VOL_MERCK_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_MERCK_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	No Effect	No Effect

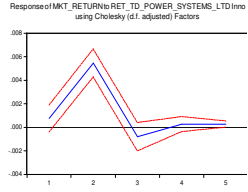
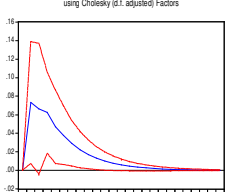
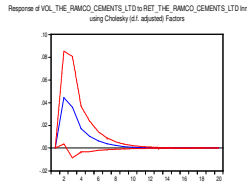
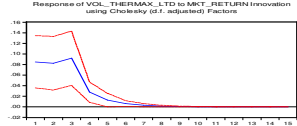
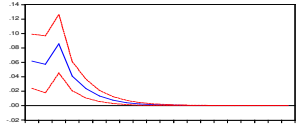
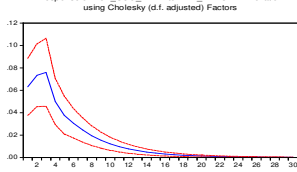
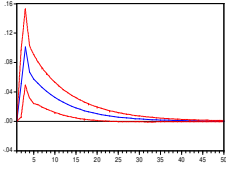
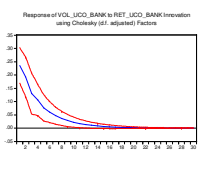
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
102	NAVA	No Effect		No effect		No Effect	No Effect
103	NCC	No Effect		No effect		No Effect	No Effect
104	NCL	No Effect		No effect		No Effect	No Effect
105	NHPC	No Effect		No effect	No effect	No Effect	No Effect
106	NIITLTD	No Effect		No Effect		No Effect	No Effect

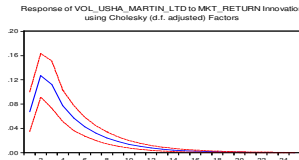
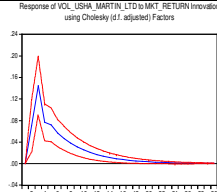
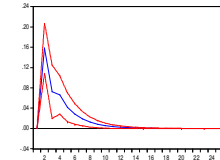
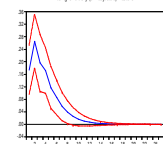
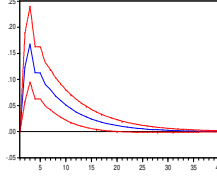
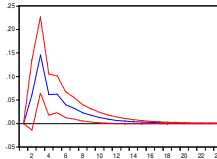
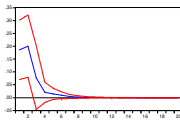
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
107	NMDC	No Effect	No Effect	No effect	No effect	No Effect	No Effect
108	RCF	No Effect		No effect			No Effect
109	RATNAMANI	No Effect	No Effect	No effect	No Effect		No Effect
110	RAYMOND	No Effect		No Effect			No Effect
111	REDINGTON	No Effect	No Effect	No effect	No effect	No Effect	No Effect

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
112	SANOFI	No Effect	No Effect	No effect		No Effect	No Effect
113	SCI			No effect		No Effect	
114	SRTRANS	No Effect	No Effect	No effect	No effect	No Effect	No Effect
115	SIMPLEXINF						No Effect
116	SKFINDIA	No Effect		No effect	No effect	No Effect	No Effect

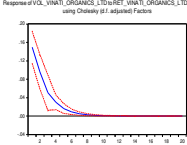
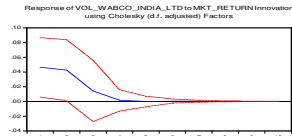
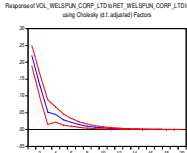
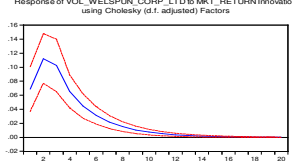
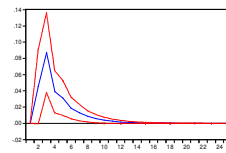
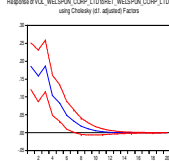
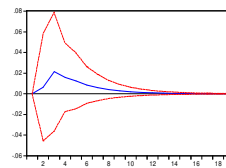
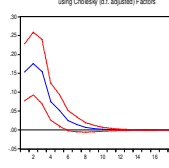
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
117	SONATASOFT W		No Effect		No effect	No Effect	No Effect
118	SUNTV	No Effect	No Effect	No effect	No effect	No Effect	No Effect
119	SUNDRMFAS T	No Effect		No effect	No effect	No Effect	No Effect
120	SPLPETRO	No Effect			No effect		No Effect
121	TATACHEM	No Effect		No effect			No Effect

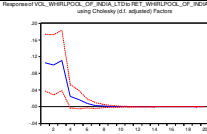
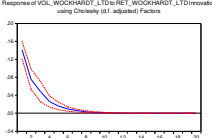
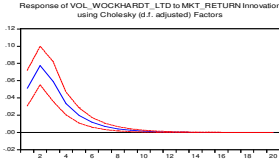
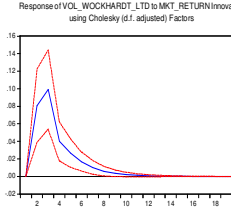
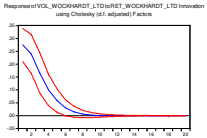
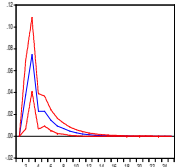
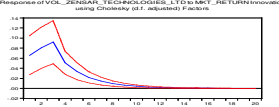
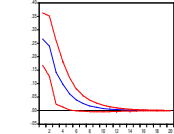
CC

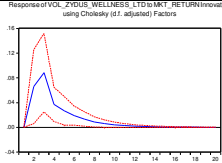
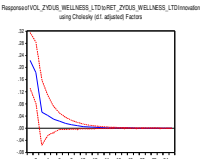
Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
122	TDPOWERSYS	No Effect	No Effect			No Effect	No Effect
123	RAMCOCEM	No Effect	No Effect		No effect	No Effect	No Effect
124	THERMAX	No Effect		No effect	No effect	No Effect	No Effect
125	TTKPRESTIG	No Effect		No effect	No effect	No Effect	No Effect
126	UCOBANK	No Effect		No effect			No Effect

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
127	USHAMART	No Effect		No effect		No Effect	No Effect
128	WABAG	No Effect	No Effect		No effect		No Effect
129	VTL	No Effect	No Effect	No effect		No Effect	No Effect
130	VESUVIUS	No Effect	No Effect	No effect			No Effect

ccii

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
131	VINATIORGA		No Effect	No effect	No effect	No Effect	No Effect
132	VSTIND	No Effect	No Effect	No effect	No effect	No Effect	No Effect
133	WABCO	No Effect		No effect	No effect	No Effect	No Effect
134	WELCORP			No effect			No Effect
135	WELSPUNLIV	No Effect	No Effect	No effect			No Effect

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
136	WHIRLPOOL	No Effect	No Effect	No effect	No effect		No Effect
137	WOCKPHAR MA			No effect			No Effect
138	ZEEL	No Effect	No Effect	No effect		No Effect	No Effect
139	ZENSARTECH	No Effect		No effect	No effect		No Effect

Sl.No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
140	ZYDUSWELL	No Effect	No Effect	No effect			No Effect
Total		27	89	54	47	73	9

Source: Computed data

Appendix IX

IRF Statistics of OC and DE in Mid-Cap Stocks Over White Swan, Grey Swan, and Black Swan Phases

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration
1	AJANTAPHARM	-	-	-	-	2	8.6	2	29	1	17.9	1	15	-	-	-	-	1	19.6	1	11	-	-	-	-
2	AKZOINDIA	-	-	-	-	3	1.21	3	15	1	12.3	1	9	-	-	-	-	-	-	-	-	-	-	-	-
3	APLLTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	ARE&M	-	-	-	-	2	6	2	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	AMBUJACEM	-	-	-	-	-	-	-	-	2	7.6	2	18	-	-	-	-	-	-	-	-	-	-	-	-
6	ANANTRAJ	1	19.5	1	30	3	10.8	3	37	1	20.9	1	29	-	-	-	-	1	21.5	1	20	-	-	-	-
7	ASAHINDIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	ASHOKA	-	-	-	-	2	8	2	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	BANKINDIA	-	-	-	-	2	3.9	2	20	1	19.4	1	24	-	-	-	-	1	19.3	1	17	-	-	-	-
10	BASF	-	-	-	-	2	8.1	2	12	1	23	1	10	-	-	-	-	1	28.3	1	13	-	-	-	-
11	BEML	-	-	-	-	3	7.2	3	40	1	28.4	1	15	-	-	-	-	1	30	1	15	-	-	-	-
12	BFUTILITIE	1	24.7	1	22	2	14	2	26	1	25.9	1	15	-	-	-	-	-	-	-	-	-	-	-	-
13	BIRLACORPN	-	-	-	-	2	9.6	2	40	1	19.2	1	20	-	-	-	-	2	24	2	25	-	-	-	-
14	BLUEDART	-	-	-	-	2	9.2	2	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	BPTC	1	24.8	1	20	2	13.3	2	23	1	25.4	1	18	-	-	-	-	1	29	1	25	-	-	-	-
16	BRIGADE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	CANFINHOME	-	-	-	-	2	9.9	2	79	1	24.7	1	17	-	-	-	-	1	31	1	11	-	-	-	-
18	CARBORUNIV	-	-	-	-	-	-	-	-	3	15.9	3	18	3	7.6	3	19	-	-	-	-	-	-	-	-
19	CASTROL	-	-	-	-	2	5.7	2	36	1	12.8	1	14	-	-	-	-	-	-	-	-	-	-	-	-
20	CENTRALBK	-	-	-	-	1	8.4	1	18	1	20.8	1	54	-	-	-	-	2	17.9	2	42	3	7.9	3	40
21	CENTURYPLY	-	-	-	-	2	10.5	2	16	1	24.5	1	15	-	-	-	-	1	29	1	13	-	-	-	-
22	ABREL	1	8.2	1	15	3	4.9	3	17	3	13	3	30	-	-	-	-	1	19.9	1	15	-	-	-	-
23	CESC	-	-	-	-	2	4.8	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	CHAMBLFERT	1	21.6	1	16	2	10.1	2	18	-	-	-	-	-	-	-	-	-	-	-	-	3	9.9	3	20
25	CUB	-	-	-	-	-	-	-	-	1	11.9	1	13	-	-	-	-	3	12	3	14	-	-	-	-
26	CROMPTON	-	-	-	-	3	6.8	3	19	3	10.8	3	19	-	-	-	-	3	31	3	21	-	-	-	-
27	CYIENT	-	-	-	-	-	-	-	-	1	23.3	1	23	-	-	-	-	-	-	-	-	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration
28	DBREALTY	1	20.9	1	15	-	-	-	-	2	24.6	2	38	-	-	-	-	2	24.9	2	36	-	-	-	-
29	DCMSRHIRAM	-	-	-	-	2	9.4	2	20	-	-	-	-	-	-	-	-	1	25.7	1	17	-	-	-	-
30	DEEPAKFERT	-	-	-	-	3	14.1	3	18	1	26.9	1	16	-	-	-	-	-	-	-	-	-	-	-	-
31	ECLERX	-	-	-	-	3	7.4	3	14	1	25.3	1	20	-	-	-	-	1	30	1	25	-	-	-	-
32	EDELWEISS	1	15	1	19	-	-	-	-	1	19.2	1	20	-	-	-	-	2	19.5	2	16	-	-	-	-
33	EIDPARRY	-	-	-	-	2	10.1	2	16	1	29.3	1	20	-	-	-	-	1	29	1	28	-	-	-	-
34	EIH LTD	1	16.8	1	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	ELECTROSL	-	-	-	-	3	9.5	3	28	1	26.6	1	29	-	-	-	-	-	-	-	-	-	-	-	-
36	ELGIEQUIP	1	18.3	1	10	3	8.2	3	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	EMAMILTD	-	-	-	-	-	-	-	-	2	12.3	2	14	-	-	-	-	2	16.5	2	16	-	-	-	-
38	ENGINEERSIN	-	-	-	-	2	7.4	2	35	1	12.9	1	22	-	-	-	-	-	-	-	-	-	-	-	-
39	ESABINDIA	1	16.1	1	16	-	-	-	-	1	25.4	1	15	-	-	-	-	2	24.9	2	16	-	-	-	-
40	EPL	-	-	-	-	-	-	-	-	1	11.7	1	19	-	-	-	-	2	15.2	2	16	-	-	-	-
41	FDCLTD	1	18.9	1	14	2	11.4	2	15	1	25.3	1	17	-	-	-	-	-	-	-	-	-	-	-	-
42	FINCABLES	-	-	-	-	2	8.3	2	17	-	-	-	-	-	-	-	-	1	19.2	1	27	-	-	-	-
43	FINPIPE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	17	1	14	-	-	-	-
44	GABRIEL	-	-	-	-	2	9.7	2	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	GHCL LTD	1	19.1	1	22	3	9	3	24	1	20.9	1	17	-	-	-	-	1	18.3	1	15	-	-	-	-
46	GODREJIND	-	-	-	-	-	-	-	-	1	22.9	1	20	-	-	-	-	-	-	-	-	-	-	-	-
47	GRAPHITE	-	-	-	-	2	8.7	2	48	1	23.6	1	17	-	-	-	-	1	20	1	16	-	-	-	-
48	GESHIPING	-	-	-	-	3	8.3	3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	GUJALKALI	-	-	-	-	2	12.7	2	25	1	33	1	27	-	-	-	-	1	30	1	14	-	-	-	-
50	FLUOROCHEM	-	-	-	-	3	9	3	14	1	19.1	1	14	-	-	-	-	2	15.4	2	10	2	10.7	2	11
51	GIPCL	-	-	-	-	2	10.4	2	18	-	-	-	-	3	13.3	3	34	1	30	1	17	-	-	-	-
52	GMDCLTD	-	-	-	-	2	10.5	2	22	-	-	-	-	3	14.6	3	30	1	27.1	1	49	-	-	-	-
53	GPPL	-	-	-	-	3	8.7	3	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	GSFC	1	17.2	1	32	3	10	3	34	-	-	-	-	-	-	-	-	1	21	1	16	-	-	-	-
55	GULFOILLUB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	HEG	-	-	-	-	3	9.8	3	50	-	-	-	-	3	10.3	3	20	-	-	-	-	-	-	-	-
57	HIMACHLFUT	1	19	1	17	-	-	-	-	2	6.5	2	27	-	-	-	-	2	16.8	2	24	-	-	-	-
58	HCC	-	-	-	-	-	-	-	-	2	10.4	2	19	-	-	-	-	1	18.7	1	27	3	12.2	3	22
59	HINDCOPPER	-	-	-	-	2	13.8	2	50	-	-	-	-	3	21.1	3	55	1	32	1	20	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration	Peak	Rate	Diminish	Duration
60	ICRA	-	-	-	-	-	-	-	-	-	-	-	-	3	10.1	3	17	2	24	2	15	-	-	-	-
61	IDEA	3	4.3	3	24	-	-	-	-	2	4.9	2	8	3	5	2	11	1	12.7	1	13	-	-	-	-
62	IFBIND	1	20.3	1	21	3	10.3	3	24	-	-	-	-	3	12.1	3	18	1	28.8	1	20	-	-	-	-
63	IFCI	-	-	-	-	3	5.3	3	28	-	-	-	-	3	8.2	3	21	2	12.8	2	18	-	-	-	-
64	IIFL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	INDIACEM	-	-	-	-	2	5.8	2	21	2	9.6	2	11	2	7.5	3	11	1	20.1	1	11	-	-	-	-
66	IOB	-	-	-	-	2	7.5	2	19	-	-	-	-	3	13.2	3	37	2	26.2	2	30	-	-	-	-
67	IGL	-	-	-	-	2	4.9	2	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	INGERRAND	-	-	-	-	3	8.2	3	15	2	10.2	2	8	-	-	-	-	2	14.7	2	18	-	-	-	-
69	INOXLEISUR	-	-	-	-	2	10.1	2	13	-	-	-	-	3	9.5	3	14	-	-	-	-	-	-	-	-
70	IPCALAB	1	7.2	1	10	2	6.7	2	12	-	-	-	-	2	5.4	2	13	-	-	-	-	-	-	-	-
71	ITD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	JKIL	-	-	-	-	-	-	-	-	3	8.1	3	12	3	8.3	3	13	3	19.7	3	14	-	-	-	-
73	JBCHEPHARM	1	20	1	12	3	10	3	15	2	8.7	2	13	3	9.7	3	16	-	-	-	-	-	-	-	-
74	JINDALSAW	1	19.2	1	18	2	7.6	2	18	-	-	-	-	-	-	-	-	1	23.5	1	23	3	14.5	3	26
75	JSL	-	-	-	-	-	-	-	-	2	7.3	2	4	-	-	-	-	1	19.1	1	11	-	-	-	-
76	JKCEMENT	-	-	-	-	2	11.9	2	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	JKLAKSHMI	-	-	-	-	3	10.8	3	17	2	11.8	2	19	-	-	-	-	1	23.3	1	26	-	-	-	-
78	JKTYRE	-	-	-	-	2	11.3	2	21	-	-	-	-	3	13.9	3	25	1	29	1	19	-	-	-	-
79	JMFINANCIL	-	-	-	-	2	11.1	2	18	-	-	-	-	2	9.8	2	19	-	-	-	-	-	-	-	-
80	JSWHL	-	-	-	-	3	3.3	3	30	-	-	-	-	-	-	-	-	2	22.3	2	14	-	-	-	-
81	JPPOWER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	JUBILANTPHARMA	-	-	-	-	3	10.8	3	20	2	7.5	2	17	3	9.8	3	18	1	21.5	1	18	-	-	-	-
83	JUSTDIAL	-	-	-	-	3	4.6	3	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	JYOTHYLAB	-	-	-	-	2	7.8	2	12	-	-	-	-	2	9.7	2	13	1	19.1	1	21	-	-	-	-
85	KPRMILL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	KAJARIACER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	24.3	1	13	-	-	-	-
87	KPIL	1	18.6	1	12	3	12.2	3	14	-	-	-	-	3	13.7	3	17	-	-	-	-	3	8	3	33
88	KANSAINER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	7.4	3	8	-	-	-	-
89	KTKBANK	1	7.9	1	15	2	6.1	2	17	-	-	-	-	3	10.1	3	17	1	21.1	1	22	2	10.3	2	21
90	KARURVYSYA	-	-	-	-	-	-	-	-	-	-	-	-	3	10.1	3	26	1	19	1	27	-	-	-	-
91	KSCL	-	-	-	-	3	8.5	3	30	-	-	-	-	3	11.2	3	25	-	-	-	-	-	-	-	-

[illegible]

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Dura-tion	Peak	Rate	Dimi-nish	Duration	Peak	Rate	Dimi-nish	Duration	Peak	Rate	Dimi-nish	Duration	Peak	Rate	Dimi-nish	Duration
124	THERMAX	-	-	-	-	3	9.2	3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	TTKPRESTIG	-	-	-	-	3	8.6	3	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
126	UCOBANK	-	-	-	-	3	7.6	3	27	-	-	-	-	3	10	3	46	1	23.5	1	26	-	-	-	-
127	USHAMART	-	-	-	-	2	12.7	2	25	-	-	-	-	3	14.5	3	27	-	-	-	-	-	-	-	-
128	WABAG	-	-	-	-	-	-	-	-	2	15.8	2	16	-	-	-	-	2	26.5	2	22	-	-	-	-
129	VTI	-	-	-	-	-	-	-	-	-	-	-	-	3	16.8	3	39	-	-	-	-	-	-	-	-
130	VESUVIUS	-	-	-	-	-	-	-	-	-	-	-	-	3	14.5	3	21	2	20	2	14	-	-	-	-
131	VINATORGA	1	15	1	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
132	VSTIND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
133	WABCO	-	-	-	-	1	4.6	1	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
134	WELCORP	1	21.9	1	17	2	11.2	2	19	-	-	-	-	3	8.7	3	16	3	18.7	3	18	-	-	-	-
135	WELSPUNLIV	-	-	-	-	-	-	-	-	-	-	-	-	3	2.1	3	15	2	17.6	2	15	-	-	-	-
136	WHIRLPOOL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	11.1	3	12	-	-	-	-
137	WOCKPHARMA	1	14.1	1	14	2	7.8	2	15	-	-	-	-	3	9.9	3	13	1	27.5	1	17	-	-	-	-
138	ZEEL	-	-	-	-	-	-	-	-	-	-	-	-	3	7.5	3	17	-	-	-	-	-	-	-	-
139	ZENSARTECH	-	-	-	-	3	9.2	3	13	-	-	-	-	-	-	-	-	1	26.6	1	18	-	-	-	-
140	ZYDUSWELL	-	-	-	-	-	-	-	-	-	-	-	-	3	8.8	3	17	1	22.4	1	21	-	-	-	-
Average		1.071	17.142	1.071	16.964	1.071	8.808	2.391	22.852	1.574	16.570	1.574	18.240	2.829	10.238	2.851	21.957	1.527	22.148	1.527	19.418	2.778	10.767	2.778	25.778

Source: Computed data

Appendix X

VAR Results of OC and DE in Small-cap Stocks Over White Swan, Grey Swan, and Black Swan Phases

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
ABAN	1	1.304	2.881	6.300	3.695	4.593	5.957	0.686	0.422	5.361	5.522	1.273	0.733
	2	-1.890	-4.484	3.413	2.010	-1.055	-1.36	1.306	0.801	-0.269	-0.267	3.131	1.811
SUNDROP	1	1.034	0.827	3.268	1.185	2.977	2.187	3.580	1.509	2.644	1.700	1.460	0.550
	2	0.242	0.194	0.616	0.223	-0.241	-0.181	4.799	2.061	2.209	1.466	-1.320	-0.502
ALLCARGO	1	0.266	0.402	6.763	3.024	2.977	2.187	3.580	1.509	2.706	1.602	1.854	0.653
	2	-2.183	-3.364	7.103	3.179	-0.241	-0.181	4.799	2.061	0.299	0.194	1.947	0.706
ANSALPI	1	2.470	4.743	0.435	0.213	0.806	0.762	6.554	3.135	1.814	1.264	4.447	1.551
	2	-0.166	-0.319	3.606	1.767	-1.935	-1.958	5.837	2.852	1.145	0.795	4.887	1.703
AUTOAXLES	1	-1.099	-0.960	9.808	3.207	2.169	1.878	4.051	1.743	3.740	2.250	2.449	0.819
	2	-3.416	-3.026	7.812	2.574	-1.057	-0.992	9.584	4.289	-1.982	-1.305	10.324	3.658
BAJAJCON	1	-0.916	-0.760	6.369	2.485	2.864	3.187	1.604	1.035	3.501	2.784	2.909	1.505
	2	-2.222	-1.847	6.176	2.400	-1.972	-2.211	5.593	3.574	-2.502	-2.011	6.628	3.408
BAJAJELEC	1	2.488	3.346	8.409	4.245	2.282	2.046	8.245	4.088	5.028	2.584	5.151	1.840
	2	-1.744	-2.403	3.990	2.006	-0.218	-0.202	6.219	3.159	-2.489	-1.390	7.573	2.846
BAJAJHIND	1	1.102	2.352	3.334	2.120	2.295	3.464	3.240	1.894	1.079	1.067	3.860	2.167
	2	-1.978	-4.560	6.093	3.976	0.626	0.944	0.862	0.508	0.669	0.669	1.269	0.720
BALMERLAWRIE	1	0.315	0.950	4.706	2.807	1.873	1.891	8.288	4.709	1.404	1.173	8.230	3.823
	2	-0.314	-0.953	3.867	2.307	-1.181	-1.316	7.160	4.083	-0.905	-0.811	6.559	3.025
BALRAMCHIN	1	-0.392	-0.653	7.153	3.794	1.356	1.654	5.317	3.030	2.082	1.568	0.119	0.048
	2	-2.116	-3.730	4.862	2.597	-0.348	-0.449	6.610	3.900	-0.980	-0.779	6.192	2.788
BATAINDIA	1	0.434	0.761	1.271	0.763	1.146	0.859	2.184	1.169	-0.205	-0.118	3.807	1.715
	2	-1.254	-2.210	2.699	1.619	-1.870	-1.431	5.358	2.897	-2.983	-1.742	6.043	2.751
BGREENERGY	1	0.516	0.837	7.738	4.126	2.258	3.355	5.284	2.814	2.820	2.812	5.731	2.451
	2	-3.165	-5.536	10.47	5.641	0.098	0.154	2.945	1.573	-0.142	-0.153	5.983	2.649

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
BLUESTARCO	1	1.491	1.104	8.078	2.900	1.776	1.262	2.793	1.288	0.899	0.430	2.957	0.996
	2	-0.122	-0.091	0.888	0.320	-0.135	-0.095	3.492	1.636	0.723	0.344	2.586	0.883
BOMBAYDYEING	1	0.976	2.516	7.030	4.345	2.646	3.505	1.211	0.886	3.136	2.593	0.683	0.431
	2	-1.055	-2.841	6.011	3.706	-2.224	-3.371	-0.710	-0.517	-2.359	-2.247	-0.819	-0.517
CARERATING	1	-0.482	-0.458	4.949	2.050	0.500	0.518	4.251	2.254	0.832	0.679	1.840	0.764
	2	0.000	0.000	0.423	0.175	-0.196	-0.207	4.239	2.254	-0.239	-0.199	3.398	1.416
CENTENKA	1	1.854	2.364	5.184	2.402	1.033	0.958	6.642	3.413	0.374	0.207	6.669	2.636
	2	-0.361	-0.474	4.657	2.174	-2.911	-2.891	10.23	5.282	-2.013	-1.200	9.529	3.779
CHENNPETRO	1	0.232	0.412	7.090	4.052	0.149	0.177	7.726	4.349	0.343	0.244	8.038	3.434
	2	-2.141	-3.934	7.221	4.140	-1.896	-2.318	8.621	4.915	-1.677	-1.284	8.253	3.572
CIPL	1	0.309	0.327	6.613	3.357	2.445	2.827	1.549	0.895	2.128	1.888	1.570	0.677
	2	-1.398	-1.507	3.830	1.930	-2.041	-2.528	4.751	2.797	-2.668	-2.526	5.045	2.183
DBCORP	1	-3.525	-1.809	11.119	3.159	-0.305	-0.270	5.855	3.108	1.820	0.984	5.862	2.468
	2	-0.559	-0.287	6.141	1.746	-2.076	-1.895	7.931	4.208	2.133	1.153	5.210	2.146
DCBBANK	1	-1.763	-2.822	10.52	6.305	-0.487	-0.542	6.561	3.860	-0.713	-0.578	5.716	2.611
	2	-0.104	-0.166	1.711	1.024	-0.775	-0.873	3.028	1.806	0.035	0.030	1.410	0.663
DELTACORP	1	0.191	0.401	6.706	4.139	1.559	1.982	9.723	5.717	2.012	1.878	11.04	5.578
	2	-1.685	-3.713	6.597	4.091	1.070	1.395	3.428	2.047	3.365	3.236	3.004	1.569
DEN	1	1.577	2.605	4.234	1.678	1.503	1.530	0.261	0.128	3.423	2.377	0.953	0.373
	2	-0.623	-1.046	0.863	0.343	-1.070	-1.122	1.488	0.738	0.421	0.306	2.724	1.074
DHANBANK	1	1.627	2.812	6.794	4.102	3.070	3.598	0.558	0.329	3.660	3.290	-0.564	-0.283
	2	-1.333	-2.392	4.993	3.002	0.509	0.645	1.054	0.626	0.788	0.771	0.689	0.349
DREDGECORP	1	-0.941	-1.278	12.707	6.110	2.690	2.345	2.257	1.147	1.616	0.902	2.144	0.772
	2	-4.868	-7.615	9.949	4.807	-3.351	-3.352	7.156	3.732	-3.692	-2.356	7.363	2.713
DYNAMATECH	1	1.630	2.210	-1.936	-0.801	2.256	2.283	0.990	0.484	3.043	1.831	2.104	0.849
	2	0.483	0.660	2.575	1.065	-1.788	-1.897	-1.415	-0.690	-2.701	-1.688	-1.367	-0.548

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
ENIL	1	2.055	1.340	5.105	1.456	1.121	0.878	4.382	1.592	4.041	1.779	-0.430	-0.105
	2	-0.679	-0.445	5.262	1.501	-2.717	-2.126	7.601	2.743	-2.180	-0.954	5.777	1.394
EROSMEDIA	1	-0.434	-0.961	4.022	2.205	1.927	3.192	-0.060	-0.036	1.821	2.266	-1.699	-0.860
	2	-1.434	-3.221	4.257	2.334	0.230	0.382	1.752	1.073	0.433	0.532	0.628	0.318
FEDERALMOGUL	1	-0.431	-0.353	5.913	1.945	1.745	1.181	1.938	0.702	4.006	1.883	-2.946	-0.747
	2	-2.668	-2.282	3.101	1.029	-4.302	-2.971	10.26	3.749	-1.718	-0.830	7.330	1.875
FMGOETZE	1	1.185	2.593	7.442	4.342	6.186	6.396	2.455	1.169	3.645	3.396	2.267	1.049
	2	-1.449	-3.297	5.717	3.342	1.155	1.246	-2.414	-1.152	-0.070	-0.071	-3.464	-1.625
FLEXITUFF	1	2.336	4.203	0.701	0.286	3.785	3.389	-1.859	-0.673	3.785	3.389	-1.859	-0.673
	2	0.965	1.725	2.409	0.985	0.634	0.557	1.015	0.366	0.634	0.557	1.015	0.366
FCONSUMER	1	3.11E	11.257	-4.32E	-4.471	3.263	3.214	5.313	1.961	1.10	0.362	1.333	0.222
	2	-2.76E	-10.409	4.00E	4.157	-2.424	-0.238	3.393	1.244	-6.533	-2.145	1.272	2.097
FRETAIL	1	0.599	2.077	-0.530	-0.294	1.290	1.297	0.514	0.203	1.564	0.962	4.242	1.287
	2	-0.072	-0.251	3.989	2.217	0.423	0.426	-0.933	-0.364	0.562	0.357	2.121	0.642
GAMMONIND	1	0.683	2.083	-2.335	-1.107	2.148	2.955	3.786	1.482	3.646	4.643	2.437	1.029
	2	-0.100	-0.307	2.539	1.206	1.133	1.571	3.490	1.349	1.519	1.916	2.851	1.205
GATILTD	1	2.173	4.825	1.236	0.822	1.073	1.479	1.743	1.135	1.265	1.169	1.305	0.683
	2	-0.892	-2.080	2.518	1.678	-0.635	-0.942	1.547	1.008	0.958	0.939	0.802	0.420
GDL	1	-0.911	-0.979	7.396	2.928	0.613	0.516	4.414	1.874	3.269	1.732	2.125	0.747
	2	-0.643	-0.697	1.005	0.396	-3.054	-2.621	8.333	3.568	-3.349	-1.786	7.988	2.824
GEOJITHFSL	1	2.280	3.729	0.926	0.531	2.989	3.864	0.926	0.582	3.300	3.148	1.501	0.769
	2	-1.160	-1.928	2.055	1.179	-0.066	-0.090	-0.278	-0.174	1.299	1.283	0.286	0.146
GREAVESCOT	1	0.143	0.142	5.236	2.286	-1.562	-1.634	8.079	3.983	-0.585	-0.311	6.874	2.318
	2	-1.966	-1.982	6.885	3.025	-3.461	-3.870	6.455	3.223	-1.719	-0.930	4.537	1.533
GTLINFRA	1	1.137	3.445	2.278	1.082	-0.226	-0.254	0.057	0.019	-0.226	-0.254	0.057	0.019
	2	-0.347	-1.052	-1.509	-0.716	0.120	0.135	-2.799	-0.941	0.120	0.135	-2.799	-0.941

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
HATHWAY	1	-0.765	-1.667	4.316	1.512	2.806	3.847	1.518	0.705	3.294	3.714	3.971	1.496
	2	-0.755	-1.649	8.098	2.846	-2.023	-3.004	1.766	0.816	-0.671	-0.831	3.945	1.490
HCL-INSYS	1	1.361	2.956	2.935	1.766	3.349	4.688	1.650	1.021	2.341	2.477	0.161	0.093
	2	-2.856	-6.828	7.632	4.658	1.027	1.403	1.284	0.794	1.709	1.755	0.876	0.508
HERITGFOOD	1	0.478	0.772	6.370	3.081	0.031	0.031	8.728	4.137	0.920	0.653	8.441	2.990
	2	-0.694	-1.134	4.356	2.101	-2.376	-2.480	8.999	4.354	-0.440	-0.326	5.632	2.019
HIMATSEIDE	1	0.637	0.741	8.103	2.210	1.642	2.018	5.661	2.769	1.385	1.175	6.678	2.591
	2	-1.970	0.720	6.993	2.216	-0.816	-1.028	6.197	3.0392	-1.061	-0.936	7.627	3.014
HOEC	1	0.958	1.781	7.901	4.674	2.118	2.637	3.523	1.918	3.691	2.958	0.522	0.220
	2	-1.624	-3.361	5.001	3.014	-1.777	-2.321	6.334	3.438	0.027	0.023	3.056	1.277
THELEELA	1	3.051	5.527	1.227	0.668	2.019	3.119	2.865	1.863	1.124	1.105	3.197	1.700
	2	-1.509	-2.865	4.982	2.722	0.184	0.285	0.320	0.208	0.156	0.152	2.131	1.150
HSIL	1	0.972	2.895	-1.491	-0.801	0.542	0.449	-4.037	-2.004	1.015	0.806	-3.934	-1.906
	2	0.407	1.214	-1.010	-0.543	-0.359	-0.325	-0.720	-0.354	-0.440	-0.384	-0.321	-0.154
HTMEDIA	1	1.676	1.882	5.932	2.428	2.204	2.637	1.576	0.740	2.815	2.871	1.789	0.795
	2	-0.254	-0.288	3.713	1.517	-0.898	-1.132	3.737	1.752	0.590	0.609	2.337	1.030
INDIABULLS	1	1.759	4.044	1.547	0.873	-0.459	-0.678	0.904	0.522	0.240	0.281	-0.255	-0.146
	2	0.000	0.001	4.570	2.607	0.973	1.453	-1.556	-0.899	2.162	2.572	-1.692	-0.971
JAGRAN	1	-0.169	-0.120	6.429	2.163	3.754	3.041	3.713	1.864	4.33	2.261	2.277	0.902
	2	-0.070	-0.050	6.169	2.073	-0.859	-0.736	4.305	2.172	2.160	1.153	2.532	0.998
JAICORPLTD	1	1.033	1.862	10.789	6.137	0.789	0.863	5.865	3.241	1.455	0.893	4.025	1.528
	2	-2.309	-4.766	9.140	5.318	-1.809	-2.259	6.157	3.508	-2.842	-2.032	5.814	2.369
JISLDVREQS	1	0.670	1.576	2.622	1.639	1.670	2.651	-1.894	-0.891	1.695	2.523	-2.255	-1.025
	2	-0.176	-0.418	1.312	0.824	1.038	1.696	-2.435	-1.140	1.540	2.382	-0.679	-0.306
JJPINFRATEC	1	0.070	0.179	3.765	1.897	1.722	1.561	-0.856	-0.370	1.025	0.804	-0.863	-0.344
	2	-0.117	-0.300	2.744	1.385	1.043	0.955	-0.474	-0.205	1.097	0.864	0.097	0.039

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
J&KBANK	1	-0.361	-1.526	8.861	4.982	2.354	3.246	4.178	2.501	2.803	2.925	2.932	1.448
	2	-0.052	-0.222	2.826	1.589	-1.028	-1.435	6.597	3.956	-0.336	-0.350	5.195	2.525
JBFIND	1	0.717	2.129	5.670	2.683	4.391	3.790	1.542	0.681	5.173	4.241	2.388	1.026
	2	0.425	1.275	2.267	1.073	1.556	1.346	1.706	0.747	1.522	1.243	2.108	0.905
JYOTISTRUC	1	2.265	4.508	1.547	0.686	-2.072	1.243	5.421	0.931	-0.870	-0.490	6.482	2.038
	2	0.027	0.055	-0.258	-0.114	0.671	0.521	4.523	2.176	-6.775	-4.091	11.15	3.581
KCP	1	0.004	0.007	5.222	2.486	-0.603	-0.547	6.204	2.822	0.548	0.443	-0.341	-0.166
	2	-2.470	-3.678	5.391	2.566	-3.947	-3.808	9.550	4.417	-2.729	-2.649	1.927	0.939
KILPP	1	2.622	5.317	3.306	1.930	0.235	0.283	0.174	0.099	1.693	1.017	9.011	2.887
	2	-1.063	-2.314	-1.356	-0.789	-2.797	-3.758	2.028	1.154	-1.994	-1.272	10.01	3.245
KKCL	1	2.917	1.391	8.374	2.054	0.339	0.706	1.843	0.792	2.525	1.788	3.789	1.589
	2	2.406	1.142	7.024	1.729	0.536	1.108	0.223	0.095	-2.859	-2.166	7.449	3.170
KITEX	1	0.890	1.980	8.210	4.992	2.034	2.399	6.064	3.240	1.693	1.017	9.011	2.887
	2	-1.032	-2.330	6.903	4.182	-2.904	-3.600	7.927	4.314	-1.994	-1.272	10.01	3.245
KOLTEPATIL	1	1.502	2.180	7.334	3.446	-0.986	-0.811	8.931	3.502	-0.260	-0.163	5.180	1.647
	2	-3.753	-5.881	9.756	4.624	-4.365	-3.918	10.18	4.075	-1.921	-1.356	6.256	2.091
LGBBROSLTD	1	1.007	1.852	5.453	2.515	-1.167	-1.028	4.255	1.765	2.435	1.487	5.825	2.196
	2	-0.157	-0.291	4.447	2.044	-3.695	-3.615	6.672	2.923	-2.288	-1.460	10.43	4.040
LAOPALA	1	0.358	0.929	2.250	0.926	0.611	0.517	6.925	3.158	3.455	2.383	1.323	0.508
	2	0.081	0.212	-2.102	-0.866	-2.893	-2.635	9.567	4.465	2.352	1.683	-0.122	-0.049
MAHSCOOTER	1	1.441	1.439	-0.174	-0.068	2.640	2.182	3.574	1.664	-0.656	-0.418	5.682	1.722
	2	0.177	0.178	-0.310	-0.121	1.251	1.053	0.824	0.390	-6.658	-5.044	16.09	5.258
MANGCHEFER	1	1.909	1.935	5.044	1.753	0.906	0.900	4.816	2.341	1.567	0.965	6.821	2.701
	2	-2.214	-2.275	3.255	1.129	1.425	1.416	6.171	3.032	-1.787	-1.171	5.281	2.169
MRPL	1	-0.274	-0.402	6.779	3.507	-0.117	-0.114	9.538	5.046	-0.393	-0.425	5.522	2.616
	2	-3.145	-4.773	6.772	3.508	-2.687	-2.825	7.221	3.951	0.089	0.096	3.708	1.762

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
MAXINDIA	1	1.319	1.758	-0.841	-0.405	-0.150	-0.187	6.465	3.824	0.970	0.691	5.213	1.910
	2	-0.979	-1.312	3.342	1.609	0.347	0.434	2.173	1.281	1.499	1.075	0.101	0.036
MAYURUNIQ	1	1.156	1.111	3.529	1.657	0.361	0.369	6.293	3.005	2.817	2.611	-0.319	-0.154
	2	-0.277	-0.268	1.465	0.691	0.083	0.086	2.186	1.050	0.269	0.249	0.914	0.4441
MBLINFRA	1	1.002	1.962	1.641	0.663	3.461	4.033	0.767	0.407	1.150	2.537	3.225	1.075
	2	-0.519	-1.021	-0.865	-0.349	-0.599	-0.702	1.398	0.746	0.021	0.049	0.519	0.168
MCLEODRESS	1	0.714	1.015	8.659	4.506	1.085	2.679	1.746	0.700	1.056	1.070	2.505	0.835
	2	-0.320	-0.459	4.384	2.273	-0.055	-0.140	-0.107	-0.042	1.772	1.816	3.630	1.211
MERCATOR	1	0.951	1.886	5.030	2.429	-0.900	-1.047	5.933	3.420	-0.014	-0.009	5.868	2.738
	2	-0.231	-0.463	5.415	2.618	-4.310	-5.901	8.505	5.036	-2.058	-1.591	7.210	3.39
MMTC	1	1.193	2.096	7.908	4.758	-0.749	-0.596	9.361	4.789	-1.215	-0.740	10.96	4.688
	2	-2.774	-5.683	7.994	4.888	-2.853	-2.464	6.389	3.343	-1.848	-1.178	6.342	2.762
MOIL	1	-0.165	-0.298	5.921	3.357	3.932	5.365	2.068	1.095	4.969	3.835	2.504	1.107
	2	-1.630	-3.012	1.301	0.733	-0.763	-1.062	0.373	0.198	1.517	1.181	0.979	0.435
MTEDUCARE	1	2.789	4.595	2.263	1.020	1.267	0.999	6.112	2.713	3.542	1.986	3.188	1.063
	2	-1.530	-2.608	-0.022	-0.010	-1.616	-1.347	5.959	2.743	0.387	0.231	3.145	1.120
MUNJALSHOW	1	0.620	0.686	8.009	3.510	1.267	0.999	6.112	2.713	-0.212	-0.209	5.860	3.170
	2	-2.291	-2.601	8.457	3.680	-1.616	-1.347	5.959	2.743	-1.216	-1.251	5.442	3.012
NBCC	1	-0.138	-0.527	6.199	3.686	0.014	0.020	6.353	4.313	0.694	0.431	2.546	1.051
	2	-0.705	-2.697	0.090	0.053	-1.537	-2.256	6.013	4.161	-0.307	-0.197	-0.637	-0.268
NAVNETEDUL	1	3.349	2.910	5.602	2.397	0.157	0.115	3.892	1.775	5.857	3.893	-1.030	-0.454
	2	-1.504	-1.334	3.016	1.282	-2.858	-2.236	3.270	1.528	0.391	0.258	-2.640	-1.168
NDTV	1	2.696	4.794	5.047	2.290	5.228	5.614	-1.312	-0.638	3.115	2.827	-3.104	-1.910
	2	-1.013	-1.830	5.951	2.710	-0.466	-0.504	-1.576	-0.766	0.394	0.384	-0.595	-0.370
NETWORK18	1	0.995	1.844	-1.947	-1.124	1.883	2.569	-2.269	-1.576	3.161	2.172	1.717	0.764
	2	-1.002	-1.929	2.027	1.169	-0.193	-0.289	-1.323	-0.923	0.345	0.244	0.492	0.219

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
NIITLTD	1	2.579	4.793	0.203	0.124	3.272	4.197	1.154	0.688	1.572	1.102	5.171	2.064
	2	-0.942	-1.842	-0.109	-0.067	-1.501	-1.974	0.555	0.331	-2.301	-1.784	5.890	2.457
NOCIL	1	1.129	2.095	6.483	3.904	1.082	1.115	6.145	3.265	3.966	3.119	6.540	2.641
	2	-1.817	-3.665	6.562	4.016	-2.618	-2.904	6.826	3.753	1.148	0.900	3.173	1.267
NOIDATOLL	1	-0.002	-0.003	4.928	2.179	3.522	3.405	5.443	2.464	6.604	2.708	-4.491	-1.400
	2	-0.334	-0.540	-0.935	-0.413	1.433	1.397	2.828	1.268	-4.028	-1.636	2.241	0.702
OMAXE	1	-1.741	-1.480	2.568	1.835	1.438	1.065	-3.749	-1.520	-1.143	-0.682	7.349	0.930
	2	2.830	2.405	-2.726	-1.953	-1.236	-0.921	1.283	0.521	1.818	1.094	3.301	0.462
OPTOCIRCUI	1	1.745	4.487	3.059	1.756	-1.143	-0.682	7.349	0.930	6.124	5.035	0.116	0.047
	2	-0.253	-0.686	2.491	1.431	1.818	1.094	3.301	0.462	1.282	1.034	0.321	0.130
OSWALSEEDS	1	1.747	3.123	2.089	0.976	3.08	4.162	-0.630	-0.325	2.596	3.011	0.996	0.426
	2	-1.203	-2.207	1.779	0.831	-1.436	-2.002	-0.605	-0.311	0.507	0.600	4.880	2.095
PARSVNATH	1	0.943	1.775	5.205	2.251	2.596	3.011	0.996	0.426	2.577	2.891	0.843	0.427
	2	0.173	0.327	6.496	2.812	0.507	0.600	4.880	2.095	-0.386	-0.445	2.487	1.2600
PATELENG	1	3.109	6.304	2.035	1.143	2.027	3.008	1.201	0.657	4.063	4.397	2.614	1.181
	2	-0.958	-2.011	2.348	1.319	-1.997	-3.144	1.156	0.632	2.217	2.341	3.411	1.551
PENINLAND	1	0.719	1.356	7.301	3.652	2.686	4.054	3.400	1.564	2.189	2.464	1.878	1.092
	2	-2.008	-3.907	6.184	3.086	1.478	2.190	2.571	1.192	-0.334	-0.384	1.627	0.943
PENIND	1	1.829	3.416	-2.692	-1.628	1.632	2.428	0.628	0.401	-0.740	-0.504	4.491	1.839
	2	-1.260	-2.455	-0.325	-0.197	-0.789	-1.218	2.870	1.824	-2.465	-1.892	9.128	3.852
PRAJIND	1	0.694	1.161	7.530	4.244	0.411	0.477	4.065	2.213	0.881	1.325	1.020	0.662
	2	-2.081	-3.839	6.298	3.631	-1.884	-2.357	7.831	4.376	0.715	1.037	1.641	1.087
PRAKASH	1	0.032	0.070	7.441	4.057	1.005	1.842	1.046	0.751	2.651	2.213	-1.301	-0.582
	2	-0.796	-1.781	2.572	1.403	-0.063	-0.116	1.319	0.952	1.286	1.097	3.967	1.790
PRISMJOHNSN	1	2.828	3.994	3.618	1.702	2.399	2.531	-0.210	-0.109	2.403	1.812	0.177	0.073
	2	-0.013	-0.020	-4.057	-1.908	0.919	0.986	5.150	2.706	-0.624	-0.502	2.913	1.249

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
PFS	1	1.064	2.111	4.997	3.236	1.278	1.314	5.472	3.335	-0.074	-0.042	4.993	2.238
	2	-1.744	-3.529	5.810	3.750	0.266	0.277	4.852	2.994	-1.580	-0.916	6.124	2.8145
PTC	1	0.200	0.295	5.783	3.313	1.155	1.161	5.683	3.594	2.883	1.841	4.450	1.646
	2	-1.043	-1.549	4.754	2.718	-0.156	-0.162	5.701	3.678	-0.168	-0.114	7.262	2.701
PURVA	1	-0.140	-0.191	11.96	5.116	1.195	1.219	5.540	2.571	1.375	0.959	-1.133	-0.610
	2	-2.421	-3.406	6.952	2.960	-1.774	-1.939	7.437	3.493	-0.653	-0.460	3.605	1.939
RAJESHEXPO	1	1.324	1.974	-0.696	-0.398	1.279	1.071	0.882	0.488	1.673	0.905	4.661	1.598
	2	-2.043	-3.127	1.137	0.652	-2.261	-1.949	3.709	2.053	-4.077	-2.356	11.66	4.099
RALLIS	1	-0.679	-0.713	10.094	4.816	1.546	1.227	6.405	3.141	2.839	1.767	2.128	0.773
	2	-1.630	-1.731	2.627	1.251	-2.863	-2.382	9.676	4.856	0.473	0.291	0.871	0.319
RAMCOIND	1	2.606	4.428	1.417	0.790	2.360	2.074	0.628	0.299	0.308	0.430	-1.832	-0.762
	2	-1.764	-3.243	2.366	1.320	-0.053	-0.047	-0.257	-0.122	0.565	0.790	0.455	0.192
RTNINDIA	1	0.957	2.327	-0.248	-0.150	0.842	1.333	0.293	0.134	3.920	3.866	1.652	0.830
	2	-0.022	-0.055	3.378	2.051	0.501	0.797	2.460	1.118	-1.401	-1.434	2.336	1.175
ORISSAIND	1	4.048	7.584	1.719	1.116	2.881	4.089	1.659	1.078	4.231	4.467	-1.324	-0.597
	2	-0.815	-1.655	-1.988	-1.289	-1.582	-2.370	2.086	1.361	-1.696	-1.770	-0.044	-0.020
RELCAPITAL	1	0.669	2.091	1.983	1.623	4.108	5.069	-0.864	-0.41	0.484	0.522	-3.333	-1.300
	2	-0.514	-1.611	3.599	2.950	-0.865	-1.061	-0.347	-0.166	0.374	0.404	-0.672	-0.262
RCOM	1	0.278	0.896	1.038	0.648	0.854	1.176	-3.46	-1.626	1.354	0.908	3.658	1.560
	2	-0.525	-1.689	5.002	3.149	0.508	0.699	0.061	0.028	-2.596	-1.971	5.068	2.277
RELIANCE	1	0.342	0.484	10.808	6.308	0.494	0.596	5.925	3.516	3.956	3.955	1.987	0.937
	2	-2.750	-4.546	8.347	5.016	-2.238	-3.049	5.749	3.510	-0.098	-0.099	-1.335	-0.643
RELINFRA	1	-0.014	-0.044	1.940	1.514	2.791	4.601	2.032	1.181	2.278	1.965	0.323	0.138
	2	0.019	0.060	1.683	1.313	0.961	1.578	-1.437	-0.840	-1.642	-1.449	-1.950	-0.826
RPOWER	1	0.290	0.965	4.658	3.691	2.500	3.211	0.737	0.374	4.636	2.976	2.797	0.940
	2	-0.328	-1.083	3.968	3.165	0.930	1.205	-2.515	-1.272	0.109	0.069	5.369	1.842

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
RELIGARE	1	0.213	0.228	8.528	2.612	1.758	2.039	2.967	1.401	3.230	2.488	4.181	1.694
	2	-2.448	-2.628	2.784	0.852	-2.080	-2.450	5.736	2.716	2.821	2.286	0.125	0.052
REPCOHOM	1	-0.294	-0.315	5.835	2.387	1.808	2.153	5.767	3.142	2.695	2.503	0.396	0.144
	2	-1.731	-1.868	0.429	0.175	1.539	1.889	2.014	1.118	1.532	1.392	-0.059	-0.021
ROLTA	1	0.779	1.498	5.325	2.577	2.695	2.503	0.396	0.144	2.789	2.711	2.783	1.080
	2	-0.995	-1.958	1.302	0.629	1.532	1.392	-0.059	-0.021	0.193	0.195	7.488	2.929
SADBHAV	1	2.364	2.289	3.897	1.311	2.431	3.667	1.219	0.687	-0.312	-0.144	-1.314	-0.280
	2	0.030	0.029	-0.020	-0.007	0.002	0.003	5.691	3.205	-2.340	-1.091	2.374	0.507
SEINVEST	1	3.535	3.482	3.872	1.071	-0.303	-0.226	-0.011	-0.003	2.934	1.490	8.815	2.642
	2	-0.362	-0.359	-0.184	-0.050	-3.049	-2.287	2.634	0.798	-6.61	-3.775	10.87	3.359
SHANTIGEAR	1	3.300	3.247	3.790	1.445	1.500	1.128	8.155	3.207	2.282	1.082	7.880	2.186
	2	-3.696	-3.843	9.094	3.466	-6.466	-5.388	10.021	4.002	-1.348	-0.651	10.349	2.876
SHOPPERSTOP	1	0.040	0.031	-2.619	-0.865	2.335	1.874	9.191	3.603	2.742	2.734	1.727	0.928
	2	-0.038	-0.029	3.334	1.100	-2.148	-1.782	11.08	4.363	1.165	1.161	3.503	1.889
RENUKA	1	1.162	2.101	2.780	1.581	3.562	4.949	2.049	1.083	2.918	2.319	4.292	1.857
	2	-2.461	-4.759	6.944	4.023	0.897	1.27	3.228	1.704	0.826	0.648	3.282	1.433
SOBHA	1	0.127	0.150	9.937	4.383	1.761	2.057	3.811	1.998	1.925	1.415	-2.087	-0.758
	2	-3.561	-4.307	5.200	2.276	-0.013	-0.016	4.297	2.281	-2.340	-1.885	5.910	2.158
JTEKT	1	0.590	0.773	2.287	0.979	1.066	1.022	1.627	0.740	0.537	0.562	4.843	2.933
	2	-2.657	-3.588	5.404	2.325	-2.676	-2.770	7.602	3.521	-0.298	-0.320	2.765	1.680
SOUTHBANK	1	-0.157	-0.247	5.137	3.192	1.460	2.093	4.127	3.136	3.693	4.108	4.454	2.178
	2	-0.740	-1.165	1.183	0.732	-1.034	-1.519	4.459	3.44	2.081	2.248	2.434	1.210
SREINFRA	1	0.303	0.655	6.475	3.508	1.340	2.395	6.773	3.429	3.334	3.369	-0.968	-0.591
	2	-1.150	-2.544	4.700	2.541	-0.671	-1.200	5.734	2.945	0.834	0.911	1.178	0.724
STLTECH	1	1.765	4.183	-0.996	-0.685	3.51	4.661	-0.551	-0.371	-0.045	-0.030	8.528	3.306
	2	-1.059	-2.574	-0.956	-0.658	-0.864	-1.218	0.382	0.258	-1.470	-1.068	7.118	2.856

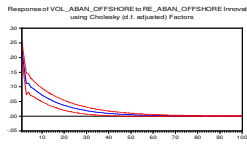
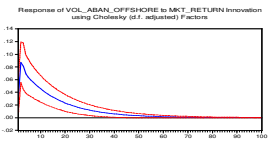
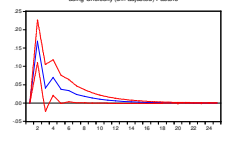
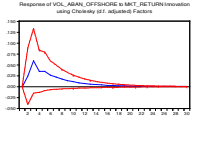
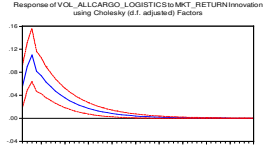
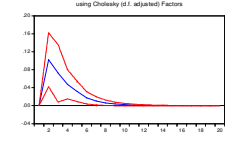
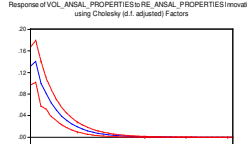
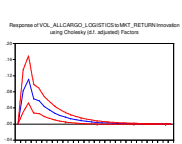
Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
SPARC	1	1.973	3.488	6.923	4.111	0.665	0.678	9.235	4.818	0.267	0.205	4.706	1.923
	2	-1.410	-2.621	5.682	3.396	-2.360	-2.648	7.851	4.245	-1.510	-1.201	6.066	2.571
SUNTECH	1	-0.061	-0.106	4.555	2.311	-0.951	-3.976	0.453	0.273	-0.988	-3.416	0.660	0.284
	2	-1.117	-1.956	3.954	2.010	-0.271	-1.147	-1.109	-0.669	-0.179	-0.620	-1.154	-0.498
SUVEN	1	2.180	3.976	4.704	2.982	1.442	1.443	1.335	0.791	-0.401	-0.354	1.304	0.832
	2	-1.242	-2.407	7.220	4.643	-1.487	-1.639	3.462	2.076	-1.761	-1.707	2.092	1.340
SWANCORP	1	0.532	1.092	-1.126	-0.819	1.355	0.984	3.021	1.595	-0.179	-0.620	-1.154	-0.498
	2	-0.041	-0.086	1.369	0.990	-1.358	-1.020	3.232	1.708	-0.401	-0.354	1.304	0.832
SWARAJENG	1	-0.773	-0.619	4.645	1.891	2.074	1.616	5.204	2.574	3.128	1.764	3.428	1.468
	2	-1.671	-1.349	2.786	1.129	-0.816	-0.674	4.330	2.183	-1.363	-0.808	3.428	1.468
TNPL	1	1.253	1.525	6.440	3.143	0.129	0.103	6.071	3.005	1.562	0.724	4.917	1.680
	2	-1.158	-1.434	4.579	2.226	-4.799	-4.327	9.435	4.909	0.951	0.459	0.386	0.134
TATACOFFEE	1	0.206	0.997	5.812	3.824	0.509	0.591	6.543	3.562	2.687	1.343	2.290	0.882
	2	0.008	0.039	3.703	2.446	-0.334	-0.405	2.583	1.440	-2.635	-1.440	6.225	2.523
TATASTLLP	1	1.122	1.555	8.325	4.230	3.57	5.060	2.084	1.259	-0.614	-0.458799	8.180	3.454840
	2	-3.770	-5.863	6.543	3.379	0.659	0.937	3.665	2.214	0.123	0.099650	3.086	1.367922
THOMASCOOK	1	1.634	2.716	7.325	3.567	2.007	1.792	2.981	1.295	3.371	3.400	3.752	1.750
	2	-1.187	-1.982	4.398	2.140	0.352	0.320	-0.589	-0.256	1.135	1.156	4.527	2.108
TREEHOUSE	1	1.312	2.408	0.954	0.411	2.262	2.211	3.499	1.520	2.007	1.792	2.981	1.295
	2	-0.285	-0.528	1.291	0.557	-4.195	-4.490	9.367	4.169	0.352	0.320	-0.589	-0.256
TBZ	1	1.336	1.829	11.994	5.186	3.868	5.460	3.690	2.213	2.070	1.179	3.372	1.029
	2	-2.422	-3.560	10.755	4.640	-0.787	-1.118	4.597	2.849	-4.599	-2.816	9.599	3.036
TRIDENT	1	-0.354	-1.552	6.425	3.690	1.662	2.781	2.993	2.121	2.968	3.465	3.613	2.303
	2	-0.329	-1.442	1.075	0.618	-1.057	-1.905	2.031	1.440	-0.347	-0.432	4.240	2.874
TV18BRDCST	1	1.672	3.538	1.390	0.979	-0.976	-0.796	8.379	3.748	2.869	3.671	5.839	3.503
	2	-0.589	-1.272	1.334	0.941	-2.823	-2.366	8.817	3.937	0.049	0.064	3.217	1.9258

Symbol	Lag	WHITE SWAN				GREY SWAN				BLACK SWAN			
		DE		OC		DE		OC		DE		OC	
		Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat	Coeff	T stat
TVTODAY	1	0.182	0.267	4.911	2.344	0.908	0.714	5.338	2.439	-4.792	-2.610	12.909	4.482
	2	-2.166	-3.292	7.797	3.757	-2.064	-1.767	8.113	3.879	-3.782	-2.146	10.141	3.442
UFLEX	1	0.496	0.710	6.828	3.528	1.437	1.713	3.667	2.145	0.798	0.350	4.739	1.443
	2	-2.996	-4.442	8.560	4.423	-1.092	-1.374	9.581	5.618	-1.849	-0.877	6.440	2.084
UNICHEMLAB	1	2.243	2.471	5.313	2.429	3.617	3.271	3.515	1.232	1.730	1.318	2.648	1.085
	2	-2.716	-3.052	4.376	1.998	1.498	1.371	-0.136	-0.047	-1.075	-0.871	9.956	4.086
UTTAMSTL	1	2.666	4.533	3.688	1.567	0.015	0.035	-1.297	-0.627	3.617	3.271	3.515	1.232
	2	-1.087	-1.962	5.841	2.485	0.027	0.065	-1.086	-0.526	1.498	1.371	-0.136	-0.047
VAIBHAVGBL	1	2.399	2.425	-1.021	-0.358	1.028	1.483	1.981	1.292	2.233	1.577	-0.261	-0.102
	2	-1.232	-1.244	4.693	1.649	-0.590	-0.857	1.768	1.158	0.443	0.314	-0.675	-0.267
VAKRANGEE	1	0.959	2.588	-0.522	-0.248	1.028	1.483	1.981	1.292	1.895	1.846	2.502	1.324
	2	-0.965	-2.599	1.897	0.903	-0.590	-0.857	1.768	1.158	0.951	0.928	1.273	0.677
VIPIND	1	2.590	3.741	8.105	4.427	1.749	1.571	8.734	4.529	0.549	0.342	7.439	3.01
	2	-2.982	-4.582	7.756	4.268	-0.819	-0.799	5.810	3.033	0.457	0.314	3.629	1.496
WHEELSINDIA LTD	1	1.133	1.572	4.163	1.726	1.725	1.365	8.777	3.702	2.529	1.366	8.528	2.702
	2	-2.448	-3.542	7.584	3.147	-3.894	-3.155	6.790	2.849	-3.562	-1.973	6.516	2.053

Source: Computed data

Appendix XI

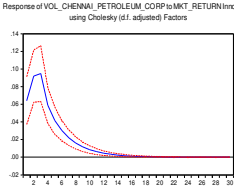
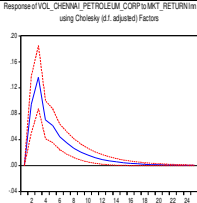
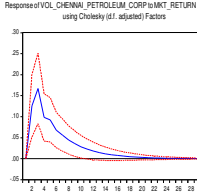
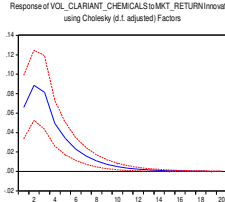
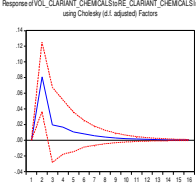
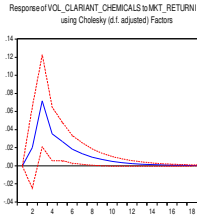
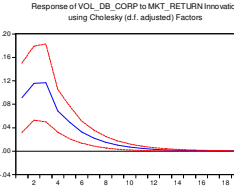
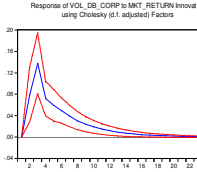
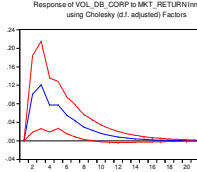
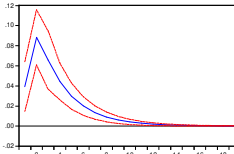
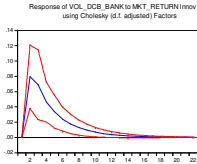
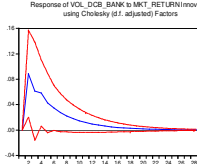
IRF Figures of OC and DE in Small-cap Stocks Over White Swan, Grey Swan, and Black Swan Phases

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
1	ABAN				No effect	No effect	
2	SUNDROP	No Effect	No Effect	No effect	No effect	No effect	No effect
3	ALLCARGO	No Effect			No effect	No effect	No effect
4	ANSALPI		No Effect	No effect		No effect	No effect

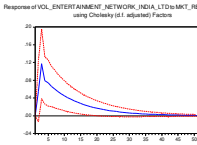
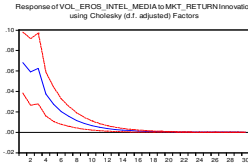
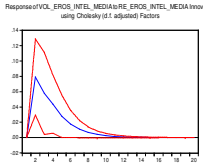
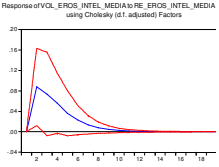
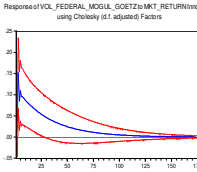
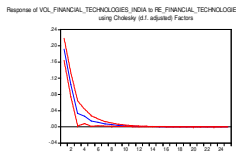
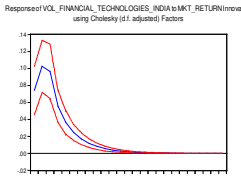
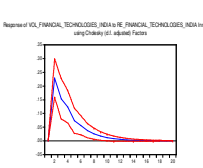
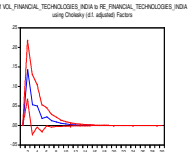
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
5	AUTOAXLES	No Effect		No effect			
6	BAJAJCON	No Effect					
7	BAJAJELEC			No effect			
8	BAJAJHIND				No effect	No effect	No effect

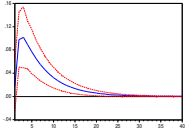
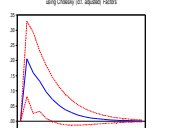
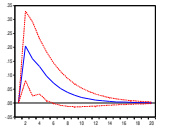
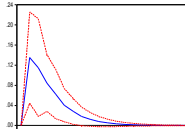
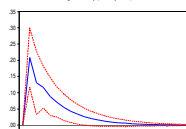
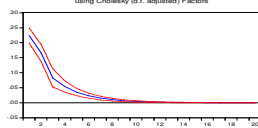
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
9	BALMERLA WRIE	No Effect	Response of VOL_BALMER_LAWRIE_... COMPANY_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BALMER_LAWRIE_... COMPANY_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BALMER_LAWRIE_... COMPANY_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors
10	BALRAMCHI N	No Effect	Response of VOL_BALRAMPUR_CHIN_MILLS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BALRAMPUR_CHIN_MILLS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BALRAMPUR_CHIN_MILLS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors
11	BATAINDIA	No Effect	No Effect	No effect	Response of VOL_BATA_INDIA to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BATA_INDIA to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors
12	BGREENERGY	No Effect	Response of VOL_BGR_ENERGY_SYSTEM to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_BGR_ENERGY_SYSTEM to RE_BGR_ENERGY_SYSTEM innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_BGR_ENERGY_SYSTEM to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_BGR_ENERGY_SYSTEM to RE_BGR_ENERGY_SYSTEM innovation using Cholesky (d.f. adjusted) Factors	No effect

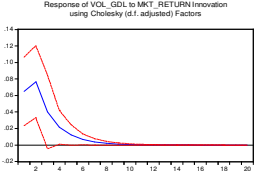
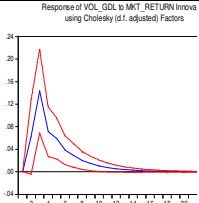
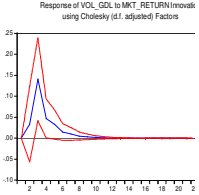
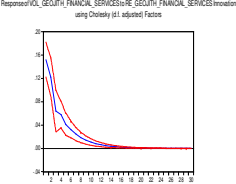
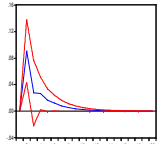
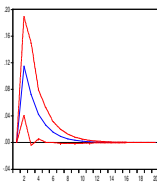
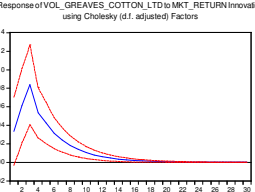
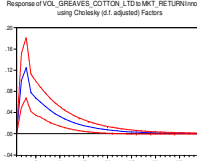
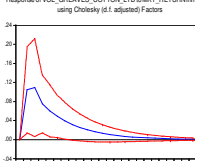
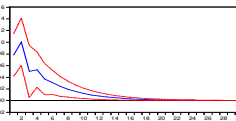
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
13	BLUESTARC O	No Effect	Response of VOL_BLUE_STAR_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect	No effect	No effect
14	BOMBAYDY EING	Response of VOL_BOMBAY_DYEING to RE_BOMBAY_DYEING Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_BOMBAY_DYEING to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_BOMBAY_DYEING to RE_BOMBAY_DYEING Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_BOMBAY_DYEING to RE_BOMBAY_DYEING Innovation using Cholesky (d.f. adjusted) Factors	No effect
15	CARERATIN G	No Effect	Response of VOL_CARE_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_CARE_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect
16	CENTENKA	Response of VOL_CENTURY_ENKA_LTD to RE_CENTURY_ENKA_LTD Innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_CENTURY_ENKA_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_CENTURY_ENKA_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_CENTURY_ENKA_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
17	CHENNPETRO	No Effect		No effect		No effect	
18	CIPL	No Effect				No effect	No effect
19	DBCORP	No Effect		No effect		No effect	
20	DCBBANK	No Effect		No effect		No effect	

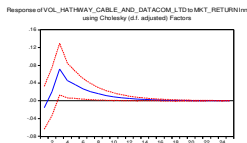
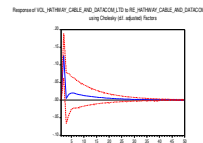
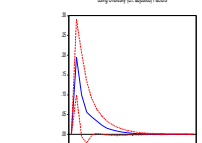
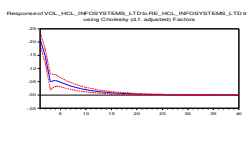
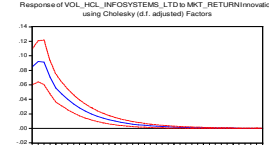
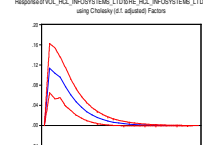
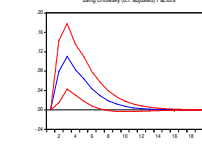
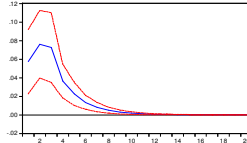
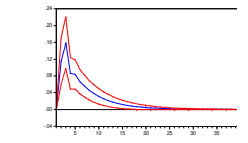
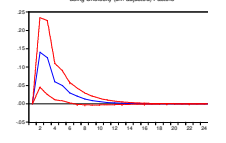
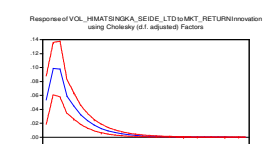
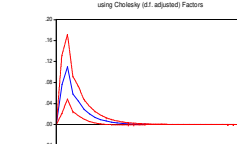
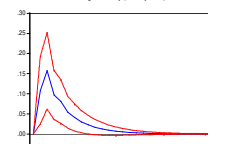
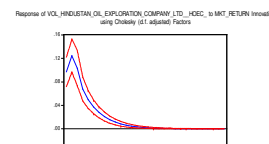
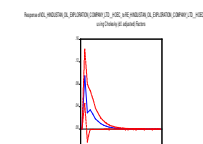
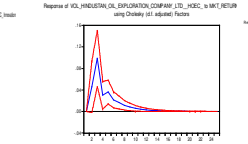
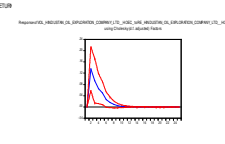
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
21	DELTACORP	No Effect	Response of VOL_DELTA_CORP to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_DELTA_CORP to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_DELTA_CORP to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors
22	DEN	No Effect	No Effect	No effect	No Effect	Response of VOL_DEN_NETWORKS to RE_NETWORKS Innoval using Cholesky (d.f. adjusted) Factors	No effect
23	DHANBANK	Response of VOL_DHANALAKSHMI_BANK to RE_DHANALAKSHMI_BANK Innoval using Cholesky (d.f. adjusted) Factors	Response of VOL_DHANALAKSHMI_BANK to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors	Response of VOL_DHANALAKSHMI_BANK to RE_DHANALAKSHMI_BANK Innoval using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_DHANALAKSHMI_BANK to RE_DHANALAKSHMI_BANK Innoval using Cholesky (d.f. adjusted) Factors	No effect
24	DREDGECORP	No Effect	Response of VOL_DREDGING_CORPO_OF_INDIA to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors	Response of VOL_DREDGING_CORPO_OF_INDIA to RE_DREDGING_CORPO_OF_INDIA Innoval using Cholesky (d.f. adjusted) Factors	Response of VOL_DREDGING_CORPO_OF_INDIA to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_DREDGING_CORPO_OF_INDIA to MKT_RETURN Innoval using Cholesky (d.f. adjusted) Factors

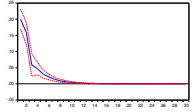
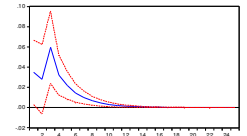
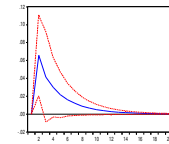
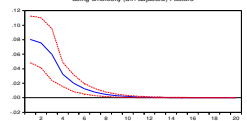
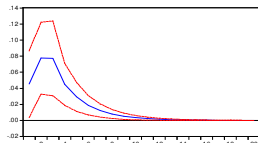
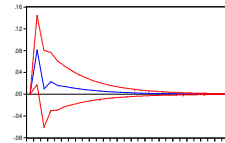
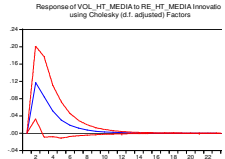
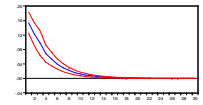
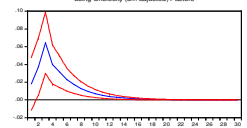
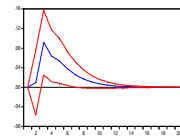
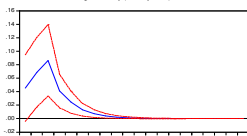
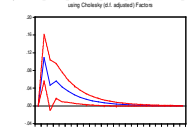
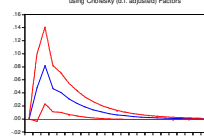
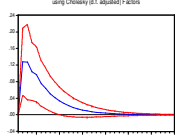
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
25	DYNAMATE CH	No Effect	No Effect	No effect	No Effect	No effect	No effect
26	ENIL	No Effect	No Effect	No effect		No effect	No effect
27	EROSMEDIA	No Effect			No effect		No effect
28	FEDERALMO GUL	No Effect	No Effect	No effect		No effect	No effect
29	FMGOETZE				No effect		No effect

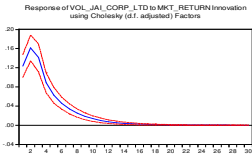
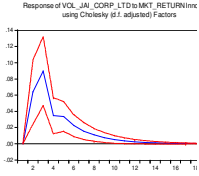
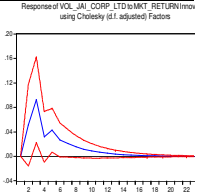
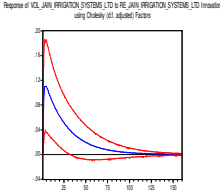
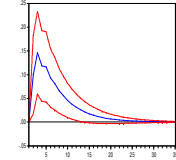
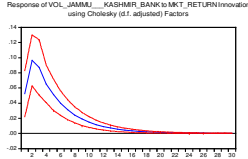
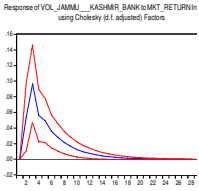
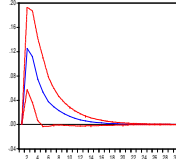
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
30	FLEXITUFF	Response of VOL_FLEXITUFF_INTERMEDIATEAL_LTD to RE_FLEXITUFF_INTERMEDIATEAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_FLEXITUFF_INTERMEDIATEAL_LTD to RE_FLEXITUFF_INTERMEDIATEAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_FLEXITUFF_INTERMEDIATEAL_LTD to RE_FLEXITUFF_INTERMEDIATEAL_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
31	FCONSUMER	No Effect	No Effect	No effect	No effect	No effect	No effect
32	FRETAIL	No Effect	No Effect	No effect	No effect	No effect	no effect
33	GAMMONIN D	No Effect	No Effect	Response of VOL_GAMMONIN_INFRA_LTD to RE_GAMMONIN_INFRA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	Response of VOL_GAMMONIN_INFRA_LTD to RE_GAMMONIN_INFRA_LTD Innovation using Cholesky (d.f. adjusted) Factors 
34	GATILTD	Response of VOL_GATILTD to RE_GATILTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	No effect	No effect	No effect

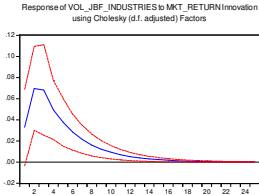
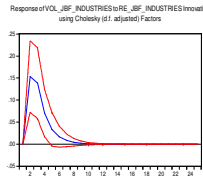
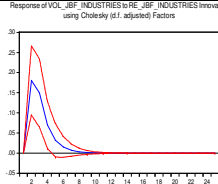
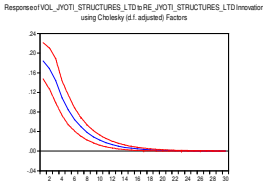
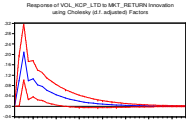
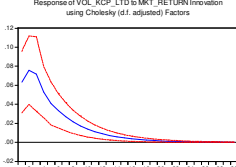
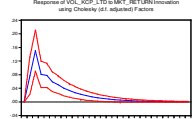
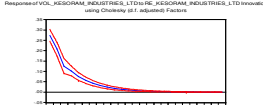
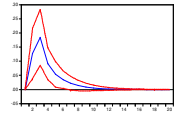
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
35	GDL	No Effect		No effect		No effect	
36	GEOJITHFSL		No Effect		No effect		No effect
37	GREAVESCO T	No Effect		No effect		No effect	
38	GTLINFRA		No Effect	No effect	No effect	No effect	No effect

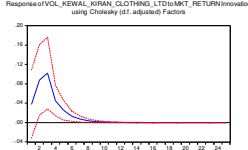
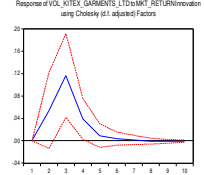
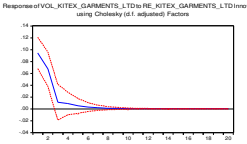
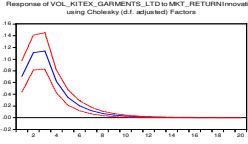
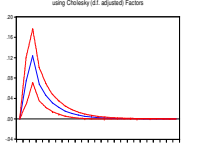
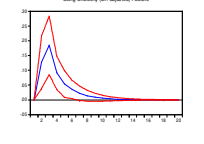
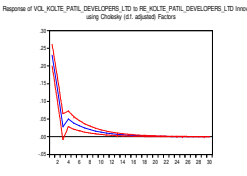
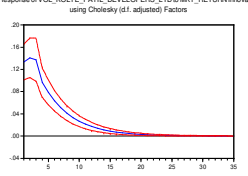
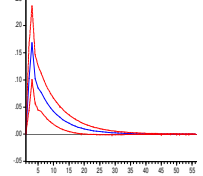
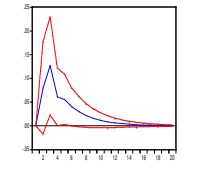
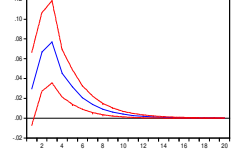
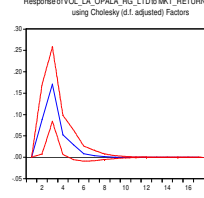
CCXXX

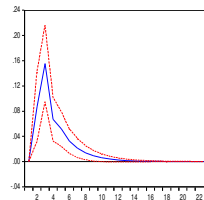
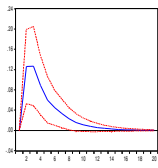
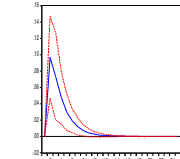
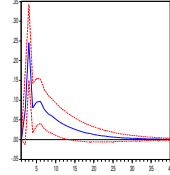
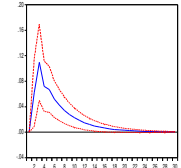
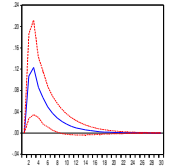
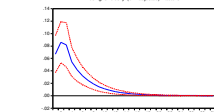
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
39	HATHWAY	Response of VOL_HATHWAY_CABLE_AND_DATACOM_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_HATHWAY_CABLE_AND_DATACOM_LTD to HATHWAY_CABLE_AND_DATACOM_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HATHWAY_CABLE_AND_DATACOM_LTD to HATHWAY_CABLE_AND_DATACOM_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect
40	HCL-INSYS	Response of VOL_HCL_INFOSYSTEMS_LTD to HCL_INFOSYSTEMS_LTD innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HCL_INFOSYSTEMS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HCL_INFOSYSTEMS_LTD to HCL_INFOSYSTEMS_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HCL_INFOSYSTEMS_LTD to HCL_INFOSYSTEMS_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect
41	HERITGFOOD	Response of VOL_HERITAGE_FOODS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	Response of VOL_HERITAGE_FOODS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HERITAGE_FOODS_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 
42	HIMATSEIDE	No Effect	Response of VOL_HIMATSONGKA_SEIDE_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HIMATSONGKA_SEIDE_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HIMATSONGKA_SEIDE_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 
43	HOEC	No Effect	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HINDUSTAN_OIL_EXPLORATION_COMPANY_LTD_HOEC to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect

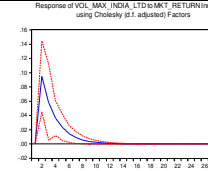
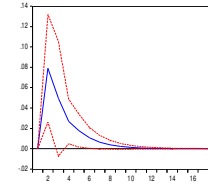
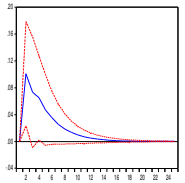
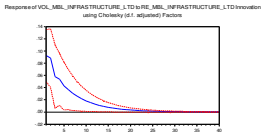
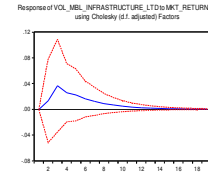
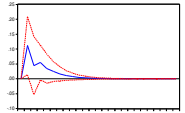
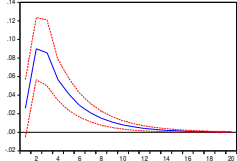
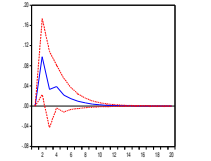
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
44	THELEELA	Response of VOL_HOTEL_LEELA_VENTURE_LTD to RE_HOTEL_LEELA_VENTURE_LTD innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HOTEL_LEELA_VENTURE_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HOTEL_LEELA_VENTURE_LTD to RE_HOTEL_LEELA_VENTURE_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	No effect
45	HSIL	Response of VOL_HSIL_SMALL_CAP to RE_HSIL_SMALL_CAP innovation using Cholesky (d.f. adjusted) Factors 	No Effect	No effect	No effect	No effect	No effect
46	HTMEDIA	No Effect	Response of VOL_HT_MEDIA to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_HT_MEDIA to RE_HT_MEDIA innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_HT_MEDIA to RE_HT_MEDIA innovation using Cholesky (d.f. adjusted) Factors 	No effect
47	INDIABULLS	Response of VOL_INDIABULLS_VENTURES_LTD to RE_INDIABULLS_VENTURES_LTD innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_INDIABULLS_VENTURES_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	Response of VOL_INDIABULLS_VENTURES_LTD to RE_INDIABULLS_VENTURES_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect
48	JAGRAN	No Effect	Response of VOL_JAGRAN_PRAKASHAN_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JAGRAN_PRAKASHAN_LTD to RE_JAGRAN_PRAKASHAN_LTD innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JAGRAN_PRAKASHAN_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_JAGRAN_PRAKASHAN_LTD to RE_JAGRAN_PRAKASHAN_LTD innovation using Cholesky (d.f. adjusted) Factors 	No effect

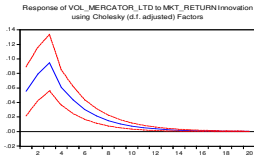
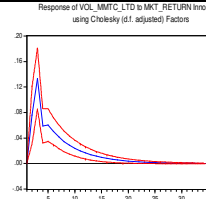
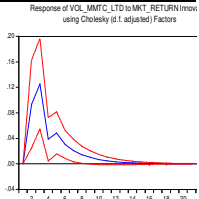
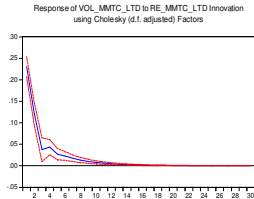
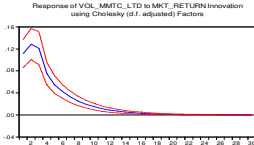
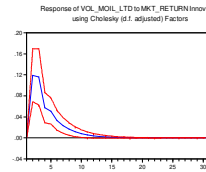
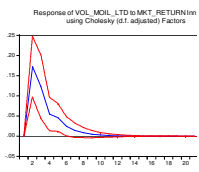
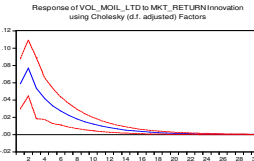
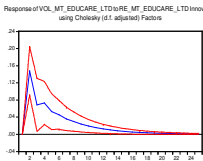
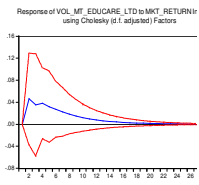
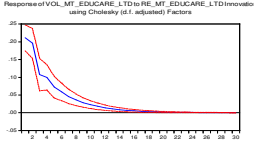
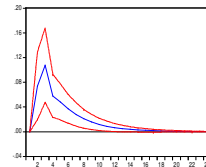
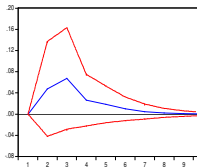
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
49	JAICORPLTD	No Effect		No effect		No effect	
50	JISLDVREQS	No Effect	No Effect		No effect		No effect
51	JPINFRATEC	No Effect	No Effect	No effect	No effect	No effect	No effect
52	J&KBANK	No Effect		No effect			No effect

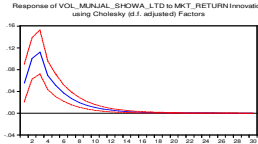
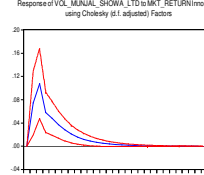
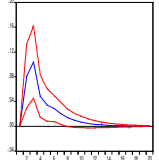
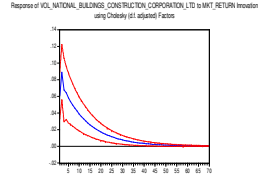
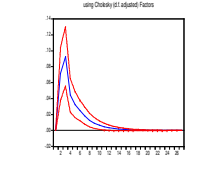
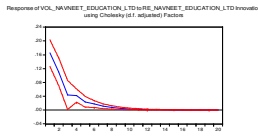
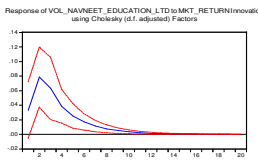
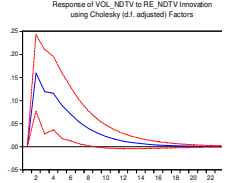
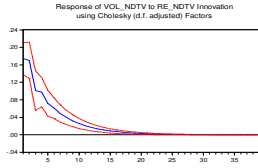
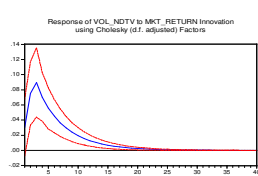
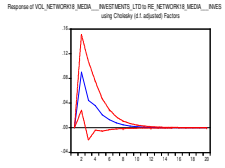
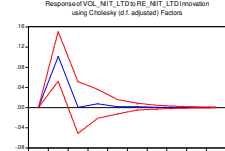
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
53	JBFIND	No Effect			No effect		No effect
54	JYOTISTRUC	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
55	KCP		No Effect	No effect	No effect	No effect	
56	KILPP	No Effect		No effect		No effect	No effect
57	KKCL		No Effect	No effect	No effect	No effect	

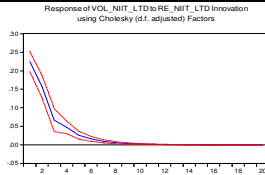
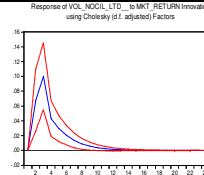
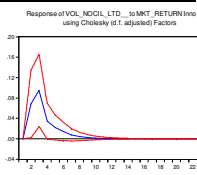
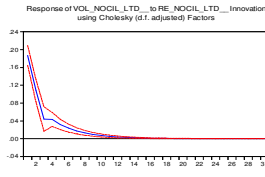
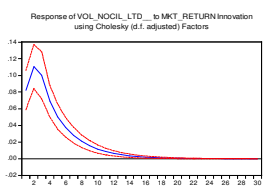
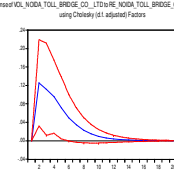
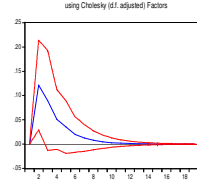
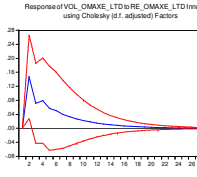
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
58	KITEX	No Effect		No effect	No effect	No effect	
59	KOLTEPATIL			No effect		No effect	
60	LGBBROSLT D			No effect		No effect	
61	LAOPALA	No Effect		No effect	No effect	No effect	

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
62	MAHSCOOTE R	No Effect	No Effect	No effect	Response of VOL_LA_OPALA_RG_LTD to MKT_RETURN using Cholesky (d.f. adjusted) Factors 	Response of VOL_MAHARASHTRA_SCOTTERS_LTD to RE_MAHARASHTRA_SCOTTERS_LTD Inno using Cholesky (d.f. adjusted) Factors 	No effect
63	MANGCHEFE R	No Effect	No Effect		Response of VOL_MAHARASHTRA_SCOTTERS_LTD to RE_MAHARASHTRA_SCOTTERS_LTD Inno using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MANGALORE_CHEMICALS_AND_FERTILIZERS_LTD to MKT_RET using Cholesky (d.f. adjusted) Factors 
64	MRPL	No Effect	No Effect	No effect	Response of VOL_MANGALORE_CHEMICALS_AND_FERTILIZERS_LTD to MKT_RET using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_MANGALORE_REFINERY_AND_PETROCHEMICALS_LTD to MKT_RET using Cholesky (d.f. adjusted) Factors 
65	MAXINDIA	No Effect		No effect	Response of VOL_MANGALORE_REFINERY_AND_PETROCHEMICALS_LTD to MKT_RET using Cholesky (d.f. adjusted) Factors 	No effect	No effect

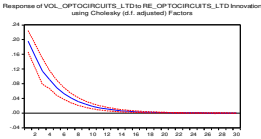
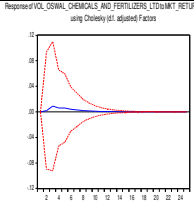
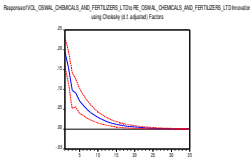
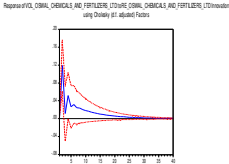
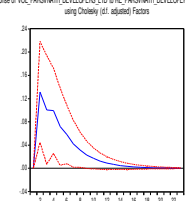
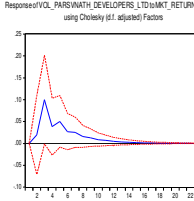
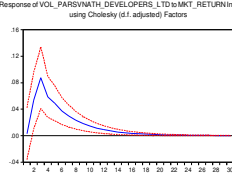
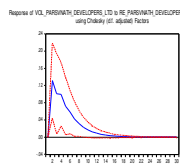
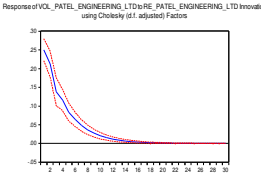
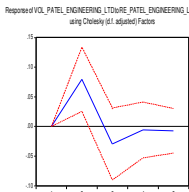
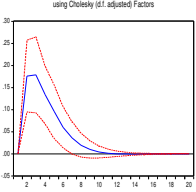
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
66	MAYURUNIQ	No Effect	No Effect	No effect		No effect	No effect
67	MBLINFRA	No Effect	No Effect	No effect	 	No effect	No effect
68	MCLEODRES S		No Effect	No effect	 	No effect	No effect
69	MERCATOR	No Effect			No effect	No effect	No effect

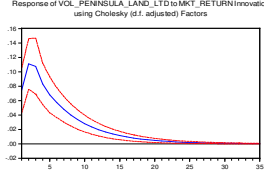
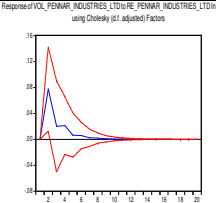
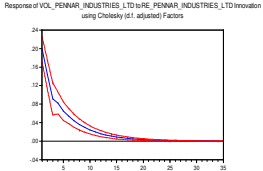
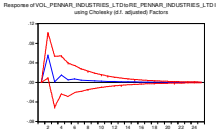
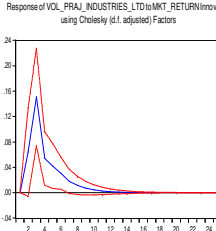
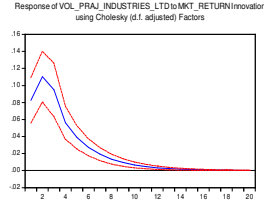
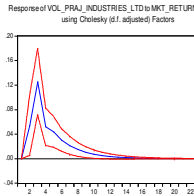
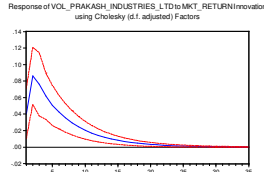
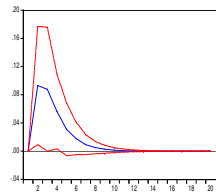
Sl. No	Symbol	White swan		Grey swan		Black swan		
		DE	OC	DE	OC	DE	OC	
70	MMTC	No Effect		No effect		No effect		
71	MOIL			No effect		No effect		
72	MTEDUCARE	No Effect			No effect	No effect	No effect	
73	MUNJALSHOW	No Effect		No effect		No effect		

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
74	NBCC	No Effect		No effect		No effect	
75	NAVNETEDU L	No Effect		No effect		No effect	No effect
76	NDTV			No effect	No effect		No effect
77	NETWORK18			No effect	No effect		No effect
78	NIITLTD	No Effect	No Effect		No effect	No effect	No effect

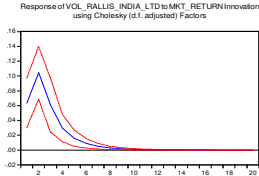
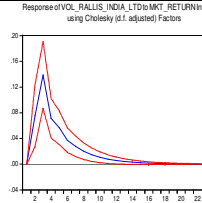
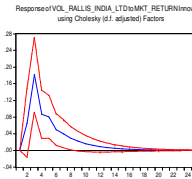
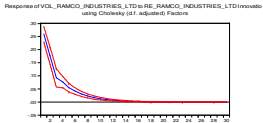
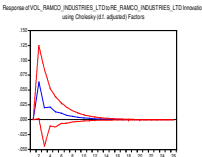
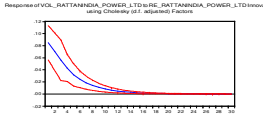
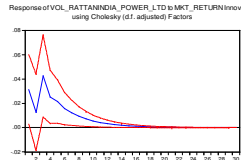
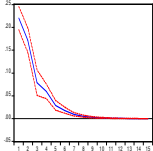
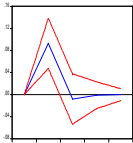
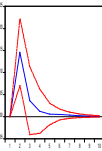
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
79	NOCIL		No Effect	No effect		No effect	
80	NOIDATOLL			No effect	No effect		
81	OMAXE	No Effect	No Effect	No effect	No effect		
82	OPTOCIRCUI	No Effect	No Effect	No effect	No effect	No effect	No effect

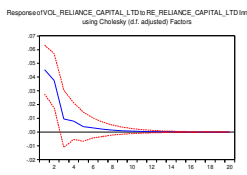
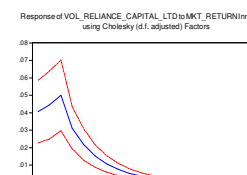
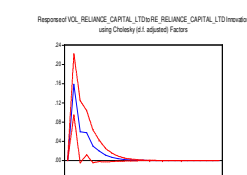
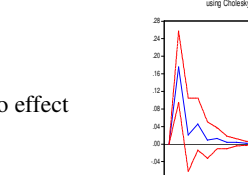
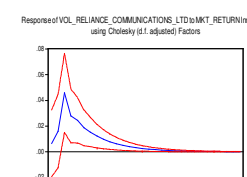
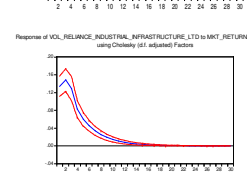
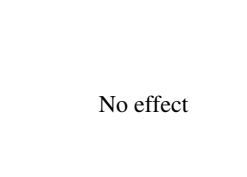
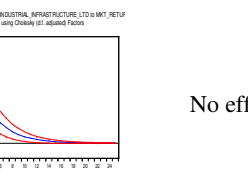
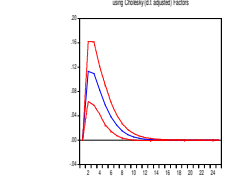
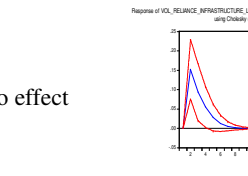
ccxl

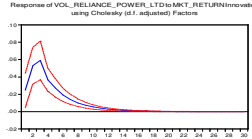
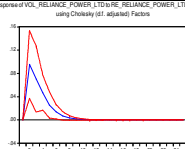
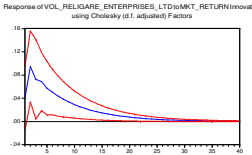
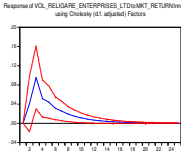
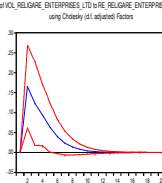
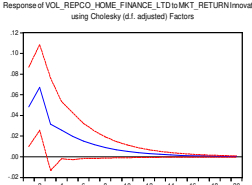
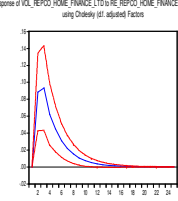
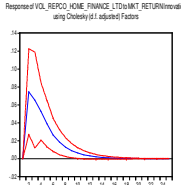
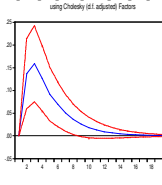
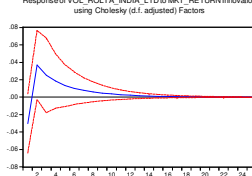
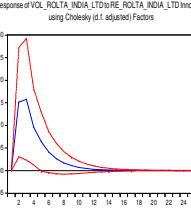
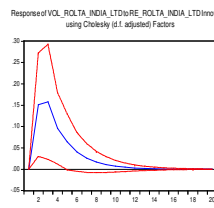
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
83	OSWALSEED S		No Effect	No effect	No effect	No effect	
84	PARSVNATH		No Effect		No effect		
85	PATELENG	No Effect			No effect	No effect	No effect
86	PENINLAND		No Effect		No effect		No effect

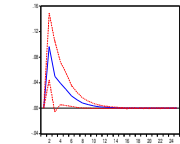
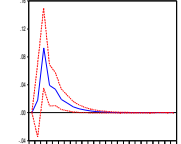
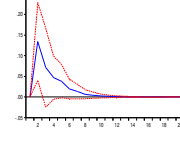
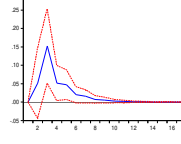
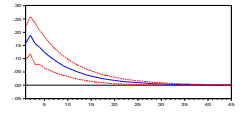
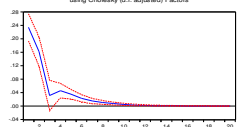
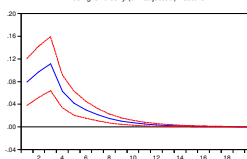
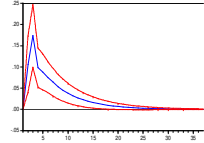
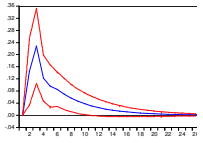
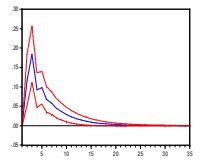
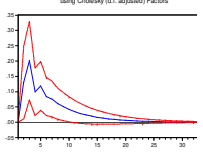
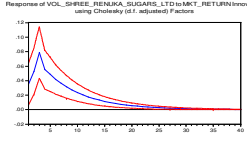
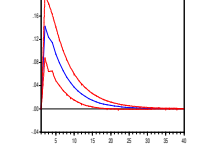
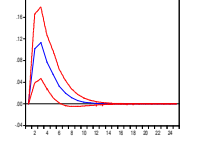
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
87	PENIND	No Effect		No effect	No effect		No effect
88	PRAJIND		No Effect		No effect		No effect
89	PRAKASH	No Effect		No effect		No effect	No effect
90	PRISMJOHNS N	No Effect		No effect	No effect		No effect

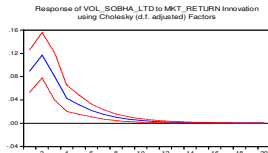
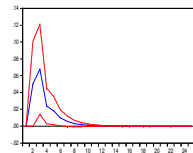
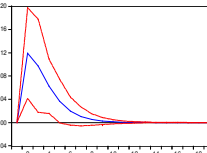
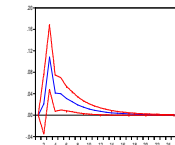
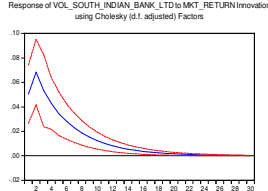
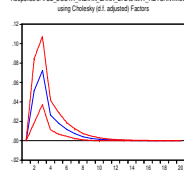
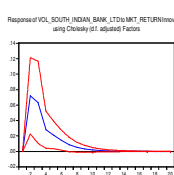
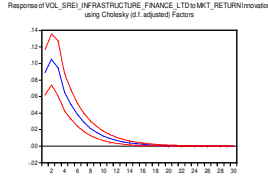
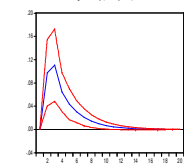
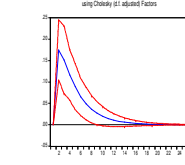
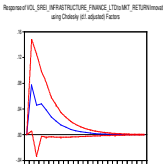
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
91	PFS	Response of VOL_PFSM_CEMENT_LTD to RE_PFSM_CEMENT_LTD innovation using Cholesky (d.f. adjusted) Factors	No Effect	Response of VOL_PFSM_CEMENT_LTD to RE_PFSM_CEMENT_LTD innovation using Cholesky (d.f. adjusted) Factors	No effect	No effect	No effect
92	PTC	Response of VOL_PTC_INDIA_FINANCIAL_SERVICES_LTD to RE_PTC_INDIA_FINANCIAL_SERVICES_LTD innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PTC_INDIA_FINANCIAL_SERVICES_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PTC_INDIA_FINANCIAL_SERVICES_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	Response of VOL_PTC_INDIA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_PTC_INDIA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors
93	PURVA	No Effect	Response of VOL_PURAVANKARA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_PURAVANKARA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors	No effect	Response of VOL_PURAVANKARA_LTD to MKT_RETURN innovation using Cholesky (d.f. adjusted) Factors
94	RAJESHEXPO	Response of VOL_RAJESH_EXPORTS_LTD to RE_RAJESH_EXPORTS_LTD innovation using Cholesky (d.f. adjusted) Factors	No Effect	No effect	No effect	No effect	No effect

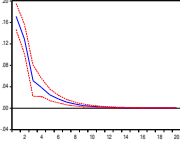
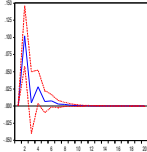
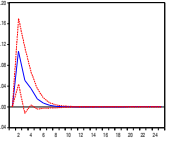
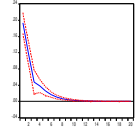
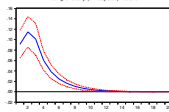
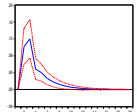
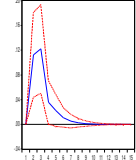
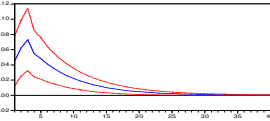
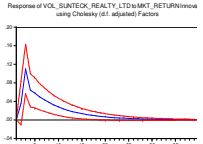
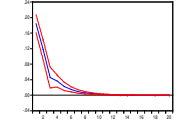
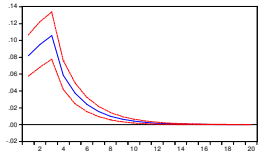
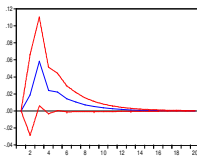
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
95	RALLIS	No Effect		No effect		No effect	
96	RAMCOIND		No Effect		No effect	No effect	No effect
97	RTNINDIA			No effect	No effect	No effect	No effect
98	ORISSAIND		No Effect		No effect		No effect

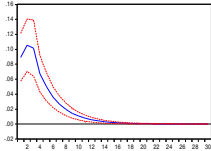
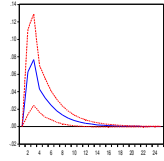
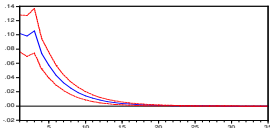
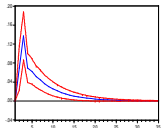
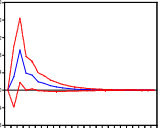
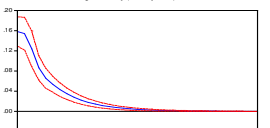
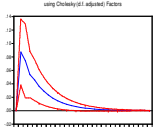
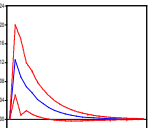
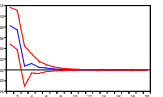
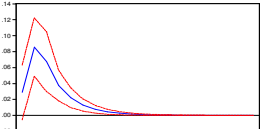
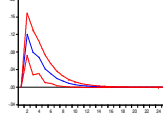
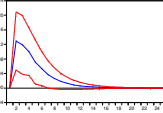
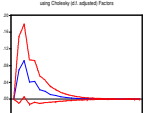
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
99	RELCAPITAL				No effect		No effect
100	RCOM	No Effect		No effect	No effect	No effect	No effect
101	RELIANCE	No Effect		No effect		No effect	
102	RELINFRA	No Effect	No Effect		No effect		No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
103	RPOWER	No Effect			No effect	No effect	No effect
104	RELIGARE	No Effect		No effect			No effect
105	REPCOHOME	No Effect					No effect
106	ROLTA	No Effect			No effect		No effect

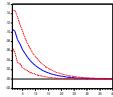
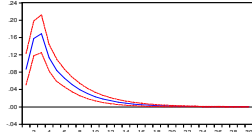
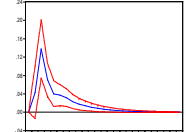
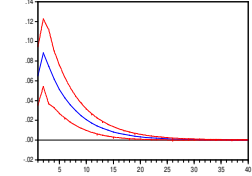
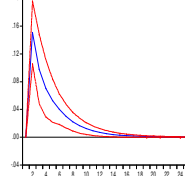
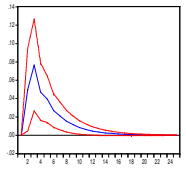
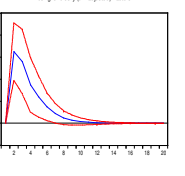
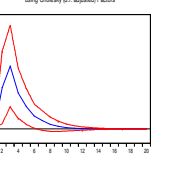
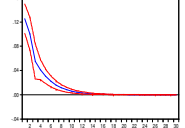
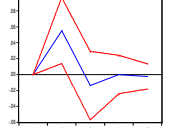
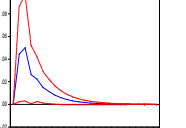
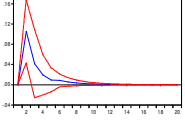
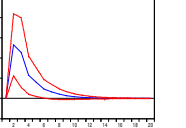
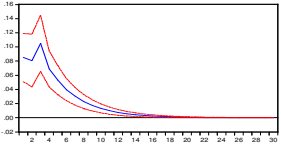
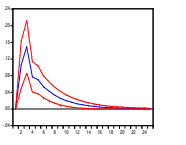
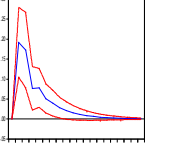
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
107	SADBHAV	No Effect	No Effect				
108	SEINVEST		No Effect	No effect	No effect	No effect	No effect
109	SHANTIGEAR			No effect		No effect	
110	SHOPPERSTOP	No Effect	No Effect	No effect		No effect	
111	RENUKA	No Effect			No effect		No effect

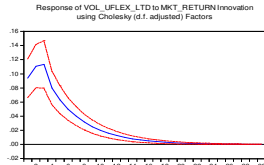
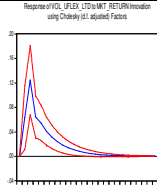
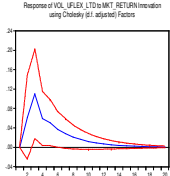
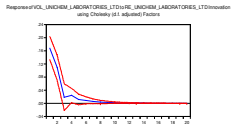
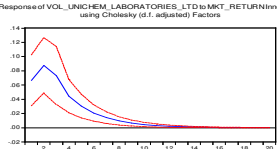
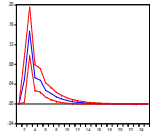
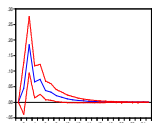
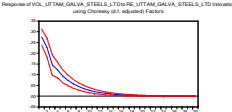
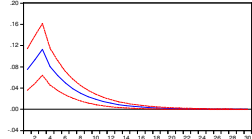
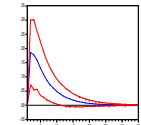
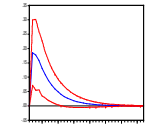
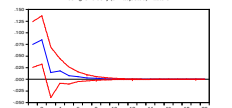
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
112	SOBHA	No Effect		No effect	 	No effect	
113	JTEKT	No Effect	No Effect	No effect		No effect	No effect
114	SOUTHBANK	No Effect		No effect	 	No effect	
115	SREINFRA	No Effect		No effect	  		

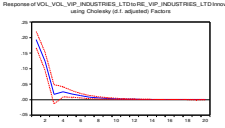
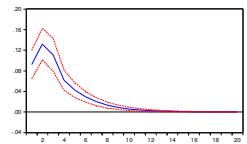
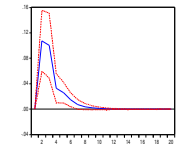
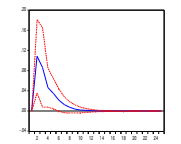
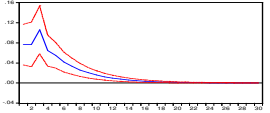
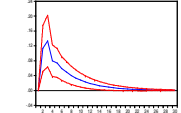
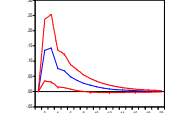
Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
116	STLTECH	Response of VOL_STLTECH_TECHNOLOGIES_LTD to PE_STLTECH_TECHNOLOGIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No Effect	Response of VOL_STLTECH_TECHNOLOGIES_LTD to PE_STLTECH_TECHNOLOGIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_STLTECH_TECHNOLOGIES_LTD to PE_STLTECH_TECHNOLOGIES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect
117	SPARC	Response of VOL_SPARC_Pharma_ADVANCED_RESEARCH_COMPANY_LTD to PE_SPARC_Pharma_ADVANCED_RESEARCH_COMPANY_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SPARC_Pharma_ADVANCED_RESEARCH_COMPANY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_SPARC_Pharma_ADVANCED_RESEARCH_COMPANY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_SPARC_Pharma_ADVANCED_RESEARCH_COMPANY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 
118	SUNTECH	No Effect	Response of VOL_SUNTECK_REALTY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_SUNTECK_REALTY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
119	SUVEN	Response of VOL_SUVEN_LIFE_SCIENCES_LTD to PE_SUVEN_LIFE_SCIENCES_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_SUVEN_LIFE_SCIENCES_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect	No effect	No effect
120	SWANCORP	No Effect	No Effect	No effect	Response of VOL_SWAN_ENERGY_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
121	SWARAJENG	No Effect	No Effect	No effect	No effect	No effect	No effect
122	TNPL	No Effect	Response of VOL_TAMIL_NADU_NEWSPRINT__PAPERS_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TAMIL_NADU_NEWSPRINT__PAPERS_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	No effect
123	TATACOFFEE	No Effect	Response of VOL_TATA_COFFEE_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_COFFEE_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_COFFEE_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 
124	TATASTLLP	No Effect	Response of VOL_TATA_SPONGE_IRON_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_SPONGE_IRON_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_TATA_SPONGE_IRON_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 
125	THOMASCOOK	Response of VOL_THOMAS_COOK_INDIA_LTD to RE_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to RE_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	No effect	Response of VOL_THOMAS_COOK_INDIA_LTD to RE_THOMAS_COOK_INDIA_LTD Innovation using Cholesky (d.f. adjusted) Factors 	Response of VOL_THOMAS_COOK_INDIA_LTD to MKT_RETURN Innovation using Cholesky (d.f. adjusted) Factors 

ccl

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
126	TREEHOUSE		No Effect	No effect	No effect	No effect	No effect
127	TBZ	No Effect		No effect		No effect	No effect
128	TRIDENT	No Effect					
129	TV18BRDCST		No Effect				
130	TVTODAY	No Effect		No effect		No effect	

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
131	UFLEX	No Effect		No effect		No effect	
132	UNICHEMLA B			No effect		No effect	
133	UTTAMSTL			No effect			
134	VAIBHAVGB L		No Effect	No effect	No effect	No effect	No effect
135	VAKRANGEE	No Effect	No Effect	No effect	No effect	No effect	No effect

Sl. No	Symbol	White swan		Grey swan		Black swan	
		DE	OC	DE	OC	DE	OC
136	VIPIND			No effect		No effect	
137	WHEELS	No Effect		No effect		No effect	
Total		51	86	44	72	46	57

Source: Computed data

Appendix XII

IRF Statistics of OC and DE in Small-cap Stocks Over White Swan, Grey Swan, and Black Swan Phases

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
1	ABAN	1	22.9	1	84	2	8.7	2	94	2	16.8	2	22	-	-	-	-	-	-	-	-	3	5.9	3	27
2	SUNDROP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	ALLCARGO	-	-	-	-	3	11	3	40	2	10.2	2	14	-	-	-	-	-	-	-	-	-	-	-	-
4	ANSALPI	2	14.1	2	27	-	-	-	-	-	-	-	-	3	11.1	3	26	-	-	-	-	-	-	-	-
5	AUTOAXLES	-	-	-	-	3	10.4	3	28	-	-	-	-	3	13.3	3	15	2	15.4	2	15	3	14.9	3	14
6	BAJAJCON	-	-	-	-	3	7.6	3	17	2	6.4	2	3	3	9.5	3	19	2	8.6	2	3	3	14.8	3	25
7	BAJAJELEC	1	17.7	1	15	2	12.7	2	17	-	-	-	-	2	10.9	3	13	2	18.2	2	12	3	13.6	3	13
8	BAJAJHIND	1	19.7	1	25	3	7.2	-	26	2	9.6	2	20	-	-	-	-	-	-	-	-	-	-	-	-
9	BALMERLAWRIE	-	-	-	-	3	8.5	3	36	-	-	-	-	3	13	3	19	-	-	-	-	21	4.2	2	13
10	BALRAMCHIN	-	-	-	-	2	8.1	2	37	-	-	-	-	3	10	3	18	-	-	-	-	3	8.5	3	18
11	BATAINDIA	-	-	-	-	-	-	-	-	-	-	-	-	3	6.1	3	12	-	-	-	-	3	8.9	3	11
12	BGREENERGY	-	-	-	-	3	12.3	3	25	2	11.2	2	15	2	7.5	2	18	2	15.8	2	13	-	-	-	-
13	BLUESTARCO	-	-	-	-	2	9	2	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	BOMBAYDYEING	1	20.1	1	21	3	11.3	3	24	2	6.9	2	3	-	-	-	-	2	7.3	2	3	-	-	-	-
15	CARERATING	-	-	-	-	2	5.2	2	13	-	-	-	-	3	7.8	3	19	-	-	-	-	-	-	-	-
16	CENTENKA	1	15.9	1	14	2	10.1	2	16	-	-	-	-	3	17	3	19	-	-	-	-	3	19.6	3	17
17	CHENNPETRO	-	-	-	-	3	9.5	3	22	-	-	-	-	3	13	3	24	-	-	-	-	3	16.7	3	28
18	CIPL	-	-	-	-	2	8.8	2	19	2	8.1	2	15	3	7.2	3	18	-	-	-	-	-	-	-	-
19	DBCORP	-	-	-	-	3	11.6	3	18	-	-	-	-	3	13.8	3	25	-	-	-	-	3	12.1	3	19
20	DCBBANK	-	-	-	-	2	8.8	2	18	-	-	-	-	2	7.9	2	21	-	-	-	-	2	8.9	2	28
21	DELTACORP	-	-	-	-	2	9.9	2	21	-	-	-	-	2	12.2	2	19	-	-	-	-	2	7.4	2	9
22	DEN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	11.3	2	26	-	-	-	-
23	DHANBANK	1	15.1	1	17	2	9.8	2	21	2	8.9	2	16	-	-	-	-	2	11.5	2	13	-	-	-	-
24	DREDGECORP	-	-	-	-	2	16.2	2	30	2	8.5	2	13	3	9	3	15	-	-	-	-	3	10.6	3	17

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
25	DYNAMATECH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	ENIL	-	-	-	-	-	-	-	-	-	-	-	-	3	11.7	3	55	-	-	-	-	-	-	-	-
27	EROSMEDIA	-	-	-	-	1	6.8	1	24	2	7.9	2	15	-	-	-	-	2	8.8	2	13	-	-	-	-
28	FEDERALMOGUL	-	-	-	-	-	-	-	-	-	-	-	-	3	15	3	167	-	-	-	-	-	-	-	-
29	FMGOETZE	1	19.1	1	16	2	10.2	2	19	2	22.9	2	17	-	-	-	-	2	14.3	2	15	-	-	-	-
30	FLEXITUFF	3	10.2	3	39	-	-	-	-	2	20.5	2	20	-	-	-	-	2	20.5	2	20	-	-	-	-
31	FCONSUMER	?	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	FRETAIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	GAMMONIND	-	-	-	-	-	-	-	-	2	13.5	2	16	-	-	-	-	2	20.9	2	24	-	-	-	-
34	GATILTD	1	22.4	1	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	GDL	-	-	-	-	2	7.7	2	13	-	-	-	-	3	14.3	3	17	-	-	-	-	3	14	3	11
36	GEOJITHFSL	1	15.2	1	23	-	-	-	-	2	9.1	2	15	-	-	-	-	2	11.5	2	13	-	-	-	-
37	GREAVESCOT	-	-	-	-	3	8.4	3	26	-	-	-	-	3	12.4	3	38	-	-	-	-	2	10.4	2	24
38	GTLINEFRA	2	10.1	2	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	HATHWAY	-	-	-	-	3	7.1	3	23	2	12.6	2	44	-	-	-	-	2	19.5	2	17	-	-	-	-
40	HCL-INSYS	1	21.2	1	34	2	9.2	2	40	2	10.9	2	20	-	-	-	-	3	11	3	16	-	-	-	-
41	HERITGFOOD	-	-	-	-	2	7.6	2	14	-	-	-	-	3	15.9	3	51	-	-	-	-	2	14	2	16
42	HIMATSEIDE	-	-	-	-	2	9.9	2	22	-	-	-	-	3	11	3	17	-	-	-	-	3	15.7	3	20
43	HOEC	-	-	-	-	2	12.5	2	23	2	9.4	2	16	3	9.9	3	19	2	136	2	11	-	-	-	-
44	THELEELA	1	20	1	17	3	6	3	17	2	6.6	2	22	-	-	-	-	-	-	-	-	-	-	-	-
45	HSIL	1	8.1	1	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	HTMEDIA	-	-	-	-	2	7.8	2	17	2	8.1	2	27	-	-	-	-	2	11.7	2	13	-	-	-	-
47	INDIABULLS	1	15.4	1	22	3	6.4	3	22	-	-	-	-	-	-	-	-	3	9.1	3	15	-	-	-	-
48	JAGRAN	-	-	-	-	3	8.7	3	14	2	10.9	2	21	3	8.2	3	22	2	12.8	2	29	-	-	-	-
49	JAICORPLTD	-	-	-	-	2	16.1	2	21	-	-	-	-	3	9	3	19	-	-	-	-	3	9.2	3	21
50	JISLDVREQS	-	-	-	-	-	-	-	-	3	11	5	137	-	-	-	-	3	14.6	3	31	-	-	-	-
51	JPINFRATEC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	J&KBANK	-	-	-	-	2	9.6	2	26	-	-	-	-	3	9.7	3	23	2	12.5	2	21	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
53	JBFIND	-	-	-	-	2	7	2	24	2	15.3	2	11	-	-	-	-	2	18	2	10	-	-	-	-
54	JYOTISTRUC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	KCP	1	18.4	1	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	20.9	3	33
56	KILPP	-	-	-	-	2	7.6	2	29	-	-	-	-	3	15	3	28	-	-	-	-	-	-	-	-
57	KKCL	1	27.4	1	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	18.5	3	15
58	KITEX	-	-	-	-	3	10.2	3	12	-	-	-	-	-	-	-	-	-	-	-	-	3	11.7	3	8
59	KOLTEPATIL	1	9.4	1	11	3	11.4	3	15	-	-	-	-	3	12.4	3	14	-	-	-	-	3	18.5	3	15
60	LGBBROSLTD	1	23	1	28	2	14.1	2	32	-	-	-	-	3	16.8	3	38	-	-	-	-	3	12.7	3	20
61	LAOPALA	-	-	-	-	3	7.7	3	18	-	-	-	-	-	-	-	-	-	-	-	-	3	17.1	3	8
62	MAHSCOOTER	-	-	-	-	-	-	-	-	-	-	-	-	3	15.6	3	15	2	12.6	3	18	-	-	-	-
63	MANGCHEFER	-	-	-	-	-	-	-	-	2	9.7	2	14	-	-	-	-	-	-	-	-	3	24.8	3	36
64	MRPL	-	-	-	-	-	-	-	-	-	-	-	-	3	10.9	3	28	-	-	-	-	3	12.3	3	23
65	MAXINDIA	-	-	-	-	2	8.6	2	25	-	-	-	-	3	14.2	3	28	-	-	-	-	-	-	-	-
66	MAYURUNIQ	-	-	-	-	-	-	-	-	-	-	-	-	2	9.5	2	13	-	-	-	-	-	-	-	-
67	MBLINFRA	-	-	-	-	-	-	-	-	-	-	-	-	2	7.9	2	14	2	10.1	2	19	-	-	-	-
68	MCLEODRESS	1	9.3	1	37	-	-	-	-	-	-	-	-	3	3.7	3	18	2	11.2	2	15	-	-	-	-
69	MERCATOR	-	-	-	-	2	9	2	20	2	9.8	2	13	-	-	-	-	-	-	-	-	-	-	-	-
70	MMTC	-	-	-	-	3	9.5	3	20	-	-	-	-	3	13.3	3	31	-	-	-	-	3	12.5	3	18
71	MOIL	1	23.1	1	21	2	12.9	2	25	-	-	-	-	2	11.9	2	17	-	-	-	-	2	7.2	2	14
72	MTEDUCARE	-	-	-	-	2	7.7	2	29	2	14.8	2	28	-	-	-	-	-	-	-	-	2	4.6	2	27
73	MUNJALSHOW	1	21.1	1	28	-	-	-	-	-	-	-	-	3	10.8	3	23	-	-	-	-	3	6.7	3	9
74	NBCC	-	-	-	-	3	11.2	3	22	-	-	-	-	3	10.8	3	23	-	-	-	-	3	10.4	3	17
75	NAVNETEDUL	-	-	-	-	2	8.9	2	69	-	-	-	-	3	9.3	3	18	-	-	-	-	-	-	-	-
76	NDTV	1	16.5	1	15	2	7.9	2	17	-	-	-	-	-	-	-	-	2	16	2	23	-	-	-	-
77	NETWORK18	1	17.4	1	30	3	9	3	32	-	-	-	-	-	-	-	-	2	9	2	13	-	-	-	-
78	NIITLTD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
79	NOCIL	1	22.5	1	13	-	-	-	-	2	10	2	9	-	-	-	-	-	-	-	-	3	9.5	3	15
80	NOIDATOLL	1	18.7	1	20	2	11.1	2	23	-	-	-	-	3	10	3	15	2	12.4	2	17	2	12.1	2	14

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
81	OMAXE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	14.7	2	27
82	OPTOCIRCUI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	OSWALSEEDS	1	19.6	1	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	9	3	13
84	PARSVNATH	1	19.5	1	33	-	-	-	-	2	11.9	2	40	-	-	-	-	2	13.2	2	31	3	10	3	19
85	PATELENG	-	-	-	-	3	8.7	3	27	2	13.2	2	21	-	-	-	-	-	-	-	-	-	-	-	-
86	PENINLAND	1	25.1	1	22	-	-	-	-	2	8	2	3	-	-	-	-	3	17.9	3	11	-	-	-	-
87	PENIND	-	-	-	-	2	11.1	2	34	-	-	-	-	-	-	-	-	2	7.7	2	10	-	-	-	-
88	PRAJIND	1	19.8	1	28	-	-	-	-	2	5.6	2	21	-	-	-	-	3	15	3	14	-	-	-	-
89	PRAKASH	-	-	-	-	2	11	2	19	-	-	-	-	3	12.5	3	19	-	-	-	-	-	-	-	-
90	PRISMJOHNSN	-	-	-	-	2	8.6	2	34	-	-	-	-	-	-	-	-	2	9.3	2	11	-	-	-	-
91	PFS	1	19.7	1	17	-	-	-	-	2	7.1	2	13	-	-	-	-	-	-	-	-	-	-	-	-
92	PTC	1	9.1	1	29	3	8.5	3	35	-	-	-	-	3	8.7	3	16	-	-	-	-	3	11.2	3	30
93	PURVA	-	-	-	-	2	7.2	2	19	-	-	-	-	3	9.3	3	21	-	-	-	-	3	13.9	3	17
94	RAJESHEXPO	-	-	-	-	2	13.8	2	22	-	-	-	-	3	12.3	3	21	-	-	-	-	-	-	-	-
95	RALLIS	1	16.9	1	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	18.2	3	22
96	RAMCOIND	-	-	-	-	2	10.4	2	13	-	-	-	-	3	13.9	3	20	-	-	-	-	-	-	-	-
97	RTNINDIA	1	25.9	1	23	-	-	-	-	2	6.3	2	16	-	-	-	-	-	-	-	-	-	-	-	-
98	ORISSAIND	1	8.5	1	23	3	4.3	3	25	-	-	-	-	-	-	-	-	2	14.6	2	9	-	-	-	-
99	RELCAPITAL	1	22	1	13	-	-	-	-	2	9.3	2	3	-	-	-	-	2	17.6	2	11	-	-	-	-
100	RCOM	1	4.6	1	14	3	5	3	18	2	15.8	2	13	-	-	-	-	-	-	-	-	-	-	-	-
101	RELIANCE	-	-	-	-	3	4.6	3	26	-	-	-	-	-	-	-	-	-	-	-	-	3	8.5	3	20
102	RELINFRA	-	-	-	-	2	14.8	2	22	-	-	-	-	3	8.9	3	22	2	15.2	2	9	-	-	-	-
103	RPOWER	-	-	-	-	-	-	-	-	2	11.3	2	14	-	-	-	-	-	-	-	-	-	-	-	-
104	RELIGARE	-	-	-	-	3	5.9	3	20	2	9.5	2	11	-	-	-	-	2	16.5	2	13	-	-	-	-
105	REPCOHME	-	-	-	-	2	9.5	2	40	-	-	-	-	3	9.5	3	23	3	15.9	3	20	-	-	-	-
106	ROLTA	-	-	-	-	2	6.7	2	20	3	9.3	3	17	2	7.5	2	19	3	15.8	3	15	-	-	-	-
107	SADBHAV	-	-	-	-	2	3.7	2	23	2	15.1	2	15	-	-	-	-	2	13.4	2	13	3	15.3	3	13
108	SEINVEST	-	-	-	-	-	-	-	-	2	9.7	2	15	3	9.3	3	15	-	-	-	-	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
109	SHANTIGEAR	2	18.8	2	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	22.8	3	27
110	SHOPPERSTOP	1	23.4	1	17	3	11.2	3	19	-	-	-	-	3	17.3	3	33	-	-	-	-	3	20	3	31
111	RENUKA	-	-	-	-	-	-	-	-	-	-	-	-	3	18.4	3	17	3	11.3	3	13	-	-	-	-
112	SOBHA	-	-	-	-	3	7.9	3	39	2	14.2	2	32	-	-	-	-	2	11.9	2	12	-	-	-	-
113	JTEKT	-	-	-	-	2	11.7	2	17	-	-	-	-	3	6.8	3	13	-	-	-	-	-	-	-	-
114	SOUTHBANK	-	-	-	-	-	-	-	-	-	-	-	-	3	10.8	3	28	-	-	-	-	2	7.2	2	14
115	SREINFRA	-	-	-	-	2	6.8	2	30	-	-	-	-	3	7.2	3	13	2	17.5	2	21	2	7.7	2	20
116	STLTECH	-	-	-	-	2	10.5	2	24	-	-	-	-	3	11	3	17	2	10.7	2	9	-	-	-	-
117	SPARC	1	17.1	1	16	-	-	-	-	2	10.2	2	11	-	-	-	-	-	-	-	-	3	12.2	3	10
118	SUNTECH	1	19.3	1	16	2	11.5	2	17	-	-	-	-	3	12	3	16	-	-	-	-	-	-	-	-
119	SUVEN	-	-	-	-	3	7.3	3	40	-	-	-	-	3	10.9	3	38	-	-	-	-	-	-	-	-
120	SWANCORP	1	18.4	1	14	3	10.6	3	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
121	SWARAJENG	-	-	-	-	-	-	-	-	-	-	-	-	3	5.8	3	18	-	-	-	-	-	-	-	-
122	TNPL	-	-	-	-	2	10.5	2	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
123	TATACOFFEE	-	-	-	-	3	10.6	3	26	-	-	-	-	3	7.7	3	21	-	-	-	-	3	9.1	3	16
124	TATASTLLP	-	-	-	-	1	15.8	1	28	-	-	-	-	3	13.7	3	32	-	-	-	-	2	12.6	2	21
125	THOMASCOOK	1	8.2	1	13	2	8.6	2	14	-	-	-	-	2	8.7	2	29	2	12.9	2	19	3	9.2	3	17
126	TREEHOUSE	1	10.7	1	40	-	-	-	-	2	12	2	17	-	-	-	-	-	-	-	-	-	-	-	-
127	TBZ	-	-	-	-	3	16.9	3	26	-	-	-	-	-	-	-	-	-	-	-	-	3	16.8	3	15
128	TRIDENT	-	-	-	-	2	8.8	2	36	-	-	-	-	3	13.7	3	23	2	13	2	14	3	8.8	3	13
129	TV18BRDCST	1	12.5	1	20	-	-	-	-	2	15	2	22	3	7.7	3	22	2	10.6	2	13	2	10.6	2	16
130	TVTODAY	-	-	-	-	3	10.5	3	25	2	5.5	2	3	3	5	3	20	-	-	-	-	2	19.2	2	19
131	UFLEX	-	-	-	-	3	11.3	3	29	-	-	-	-	3	14.9	3	21	-	-	-	-	3	11	3	20
132	UNICHEMLAB	1	16.8	1	15	2	8.8	2	19	-	-	-	-	3	12.5	3	23	-	-	-	-	3	18.5	3	20
133	UTTAMSTL	1	27.6	1	24	3	11.3	3	27	-	-	-	-	3	14.7	3	18	2	18.6	2	30	-	-	-	-
134	VAIBHAVGBL	2	84.4	2	17	-	-	-	-	-	-	-	-	2	18.6	2	30	-	-	-	-	-	-	-	-
135	VAKRANGEE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sl. No	Symbol	White Swan								Grey Swan								Black Swan							
		DE				OC				DE				OC				DE				OC			
		Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration	Peak day	Peak point	Diminishing day	Duration
136	VIPIND	1	19.3	1	15	2	13.2	2	17	-	-	-	-	-	-	-	-	-	-	-	-	2	10.9	2	13
137	WHEELS	-	-	-	-	3	10.6	3	27	-	-	-	-	2	10.7	2	11	-	-	-	-	3	14.3	3	20
	Total	1.137	18.537	1.137	23.235	2.386	9.501	2.379	24.909	2.045	10.877	2.091	19.386	2.845	11.147	2.859	23.929	2.170	16.153	2.191	15.659	3.070	12.642	2.736	18.526

Source: Computed data

QUESTIONNAIRE

Demographic Variables

1. Gender:
 - a. Male
 - b. Female
 - c. Others
2. Age: -----
3. Education:
 - a. Up to SSLC
 - b. Secondary
 - c. Diploma
 - d. Graduate
 - e. Postgraduate
 - f. Doctoral
 - g. Illiterate
4. Occupation:
 - a. Student
 - b. Profession
 - c. Business
 - d. Salaried
 - e. Retired
 - f. Homemaker
 - g. Job seeking
5. Annual income:
 - a. Below 2.5 lakhs
 - b. 5 to 5 lakhs
 - c. 5 to 10 lakhs
 - d. Above 10 lakhs
6. How long have you been actively investing in the stock market?
 - a. Less than 3 years
 - b. 4-6 years

-
- c. 7-9 years
 - d. 10 years and above
7. On average, how often do you make stock market transactions (buying/selling)?
- a. Daily
 - b. Weekly
 - c. Bi-weekly
 - d. Monthly
 - e. Rarely
8. What is the primary goal of your stock market investments?
- a. Portfolio Diversification
 - b. Income Generation.
 - c. Long-Term Wealth Preservation
 - d. Speculative Trading
 - e. Socially Responsible Investing
 - f. Retirement Planning
 - g. Risk Mitigation
9. Think about a stock you've sold. What was your primary reason for selling it?
- a. Tax harvesting
 - b. Decrease in dividend policy
 - c. Reaching target price
 - d. Loss of money
 - e. Unfavourable market condition
10. How do you usually gather information for making investment decisions?
(Select all that apply)
- a. Newspapers
 - b. Online media
 - c. Friends
 - d. Brokers/Advisors

Variables measuring OC, DE and Overreaction to private information

11. Show your agreement with the following statements.

(SA- Strongly Agree, A- Agree, N-Neutral, D- Disagree, SD- Strongly Disagree)

	Statements	SD	D	N	A	SA
1.	I believe that beating the market is easy for me.					
2.	I feel that I have a good understanding of the stock market compared to an average person.					
3	I always feel that my own decisions are right regarding my investments.					
4	As I gain more information about a stock or market situation, my confidence in my predictions naturally increases.					
5	My instincts can never be wrong about my investment decisions.					
6	I find it difficult to let go of stocks at a loss even if it makes sense.					
7	I sell shares immediately if there is an increase in their value.					
8	The pain of financial loss is more than the pleasure of financial gain.					
9	I will wait for a long period to increase the value if it is at loss now					
10	I occasionally think about the potential missed gains from selling too early.					
11	I am very much satisfied with the investment decision I have made till now					
12	The rate of return I achieve meets my expectations.					
13	Private information, such as insider trading news, significantly influences my investment decisions.					
14	I give minimal consideration to publicly available information, such as financial reports and news articles, in my investment analysis.					
15	I am more likely to act on private information .					

	Statements	SD	D	N	A	SA
16	I believe that private information is more important than public information in shaping my investment strategy.					
17	I respond quickly to private information.					

STOCK SYMBOLS AND NAME

3MINDIA	3M India Limited
ABAN	Aban Offshore Limited
ABB	ABB India Limited
ACC	ACC Limited
ADANIENT	Adani Enterprises Limited
ADANIPTS	Adani Ports and Special Economic Zone Limited
SUNDROP	Sundrop Brands Limited
AIAENG	AIA Engineering Limited
AJANTAPHARM	Ajanta Pharma Limited
AKZOINDIA	Akzo Nobel India Limited
APLLTD	Alembic Pharmaceuticals Limited
ALLCARGO	Allcargo Logistics Limited
ALSTOM	Alstom India Limited
ALSTOMTD	Alstom T&D India Limited
ARE&M	Amara Raja Energy & Mobility Limited
AMBUJACEM	Ambuja Cements Limited
ANANTRAJ	Anant Raj Limited
ANSALPI	Ansal Properties & Infrastructure Limited
APARIND	Apar Industries Limited
APOLLOHOSP	Apollo Hospitals Enterprise Limited
APOLLOTYRE	Apollo Tyres Limited
AARTIIND	Aarti Industries Limited
ASAHIINDIA	Asahi India Glass Limited
ASHOK	Ashok Leyland Limited
ASHOKA	Ashoka Buildcon Limited
ASIANPAINT	Asian Paints Limited
ASTRAL	Astral Limited
ASTRAZENCA	AstraZeneca Pharma India Limited
ATUL	Atul Limited
AUROBINDO	Aurobindo Pharma Limited
AUTOAXLES	Automotive Axles Limited
AXIS	Axis Bank Limited
JPINFRATEC	Jaypee Infratech Limited
BAJAJ-AUTO	Bajaj Auto Limited
BAJAJCON	Bajaj Consumer Care Limited

BAJAJELEC	Bajaj Electricals Limited
BAJFINANCE	Bajaj Finance Limited
BAJAJFINSV	Bajaj Finserv Limited
BAJAJHIND	Bajaj Hindusthan Sugar Limited
BAJAJHLDNG	Bajaj Holdings & Investment Limited
BALMERLAWRIE	Balmer Lawrie & Co. Limited
BALRAMCHIN	Balrampur Chini Mills Limited
BANKBARODA	Bank of Baroda
BANKINDIA	Bank of India
BASF	BASF India Limited
BATAINDIA	Bata India Limited
BEML	BEML Limited
BERGEPAIN	Berger Paints India Limited
BFUTILITIE	BF Utilities Limited
BGREENERGY	BGR Energy Systems Limited
AIRTELPP	Bharti Airtel Limited Partly Paid Shares
BEL	Bharat Electronics Limited
BHARATFORG	Bharat Forge Limited
INDUSTOWER	Indus Towers Limited
BHEL	Bharat Heavy Electricals Limited
BIOCON	Biocon Limited
BIRLACORPN	Birla Corporation Limited
BLUEDART	Blue Dart Express Limited
BLUESTARCO	Blue Star Limited
BPTC	Bombay PTC India Limited
BOMBAYDYEING	Bombay Dyeing & Manufacturing Company Limited
BOSCH	Bosch Limited
BPCL	Bharat Petroleum Corporation Limited
BRIGADE	Brigade Enterprises Limited
BRITANNIA	Britannia Industries Limited
CANARA	Canara Bank
CANFINHOME	Can Fin Homes Limited
CARBORUNIV	Carborundum Universal Limited
CARERATING	CARE Ratings Limited
CASTROL	Castrol India Limited
CENTRALBK	Central Bank of India
CENTENKA	Century Enka Limited

CENTURYPLY	Century Plyboards (India) Limited
ABREL	Aditya Birla Real Estate Limited
CESC	CESC Limited
CHAMBLFERT	Chambal Fertilisers and Chemicals Limited
CHENNPETRO	Chennai Petroleum Corporation Limited
CHOLAFIN	Cholamandalam Investment and Finance Company Limited
CIPLA	Cipla Limited
CUB	City Union Bank Limited
CIPL	Centuria Industrial
COALINDIA	Coal India Limited
COLGATE	Colgate-Palmolive (India) Limited
CONCOR	Container Corporation of India Limited
COROMANDEL	Coromandel International Limited
CRISIL	CRISIL Limited
CROMPTON	Crompton Greaves Consumer Electricals Limited
CUMMINS	Cummins India Limited
CYIENT	Cyient Limited
DABUR	Dabur India Limited
DBCORP	D B Corp Limited
DBREALTY	DB Realty Limited
DCBBANK	DCB Bank Limited
DCMSRHIRAM	DCM Shriram Limited
DEEPAKFERT	Deepak Fertilisers and Petrochemicals Corporation Limited
DELTACORP	Delta Corp Limited
DEN	DEN Networks Limited
DHANBANK	Dhanlaxmi Bank Limited
DIVIS	Divi's Laboratories Limited
DLF	DLF Limited
DREDGECORP	Dredging Corporation of India Limited
DRREDDY	Dr. Reddy's Laboratories Limited
DYNAMATECH	Dynamatic Technologies Limited
ECLERX	eClerx Services Limited
EDELWEISS	Edelweiss Financial Services Limited
EICHERMOT	Eicher Motors Limited
EIDPARRY	EID Parry (India) Limited
EIHLTD	EIH Limited
ELECTROSL	Electrosteel Castings Limited

ELGIEQUIP	Elgi Equipments Limited
EMAMILTD	Emami Limited
ENGINEERSIN	Engineers India Limited
ENIL	Entertainment Network (India) Limited
EROSMEDIA	Eros International Media Limited
ESABINDIA	ESAB India Limited
ESCORT	Escorts Kubota Limited
EPL	EPL Limited
EXIDE	Exide Industries Limited
SCHAEFFLER	Schaeffler India Limited
FDCLTD	FDC Limited
FEDERALBNK	Federal Bank Limited
FEDERALMOGUL	Federal-Mogul Limited
FMGOETZE	Federal-Mogul Goetze (India) Limited
FINCABLES	Finolex Cables Limited
FINPIPE	Finolex Industries Limited
FSL	Firstsource Solutions Limited
FLEXITUFF	Flexituff Ventures International Limited
FORTIS	Fortis Healthcare Limited
FCONSUMER	Future Consumer Limited
FRETAIL	Future Retail Limited
GABRIEL	Gabriel India Limited
GAIL	GAIL (India) Limited
GAMMONIND	Gammon India Limited
GATILTD	Gati Limited
GDL	Gateway Distriparks Limited
GEOJITHFSL	Geojit Financial Services Limited
GHCLLTD	GHCL Limited
GILLETTE	Gillette India Limited
GSKCONS	GlaxoSmithKline Consumer Healthcare Limited
GLENMARK	Glenmark Pharmaceuticals Limited
GMRINFRA	GMR Airports Infrastructure Limited
GODFRYPHLP	Godfrey Phillips India Limited
GODREJCON	Godrej Consumer Products Limited
GODREJIND	Godrej Industries Limited
GODREJPROP	Godrej Properties Limited
GRAPHITE	Graphite India Limited

GRASSIM	Grasim Industries Limited
GESHIPPING	The Great Eastern Shipping Company Limited
GREAVESCOT	Greaves Cotton Limited
GTLINFRA	GTL Infrastructure Limited
GUJALKALI	Gujarat Alkalies and Chemicals Limited
FLUOROCHEM	Gujarat Fluorochemicals Limited
GIPCL	Gujarat Industries Power Company Limited
GMDCLTD	Gujarat Mineral Development Corporation Limited
GPPL	Gujarat Pipavav Port Limited
GSFC	Gujarat State Fertilizers & Chemicals Limited
GULFOILLUB	Gulf Oil Lubricants India Limited
HATHWAY	Hathway Cable and Datacom Limited
HAVELLS	Havells India Limited
HCL-INSYS	HCL Infosystems Limited
HCLTECH	HCL Technologies Limited
HDFCBANK	HDFC Bank Limited
HEG	HEG Limited
HERITGFOOD	Heritage Foods Limited
HEROMOTO	Hero MotoCorp Limited
HIMACHLFUT	Himachal Futuristic Communications Limited
HIMATSEIDE	Himatsingka Seide Limited
HINDALCO	Hindalco Industries Limited
HINDPETRO	Hindustan Petroleum Corporation Limited
HCC	Hindustan Construction Company Limited
HINDCOPPER	Hindustan Copper Limited
HINDZINC	Hindustan Zinc Limited
HOEC	Hindustan Oil Exploration Company Limited
HONAUT	Honeywell Automation India Limited
THELEELA	Hotel Leelaventure Limited
HSIL	HSIL Limited
HTMEDIA	HT Media Limited
HUL	Hindustan Unilever Limited
ICICI	ICICI Bank Limited
ICRA	ICRA Limited
IDBI	DBI Bank Limited
IDEA	Vodafone Idea Limited
IDFC	IDFC Limited

IFBIND	IFB Industries Limited
IFCI	IFCI Limited
IIFL	IIFL Finance Limited
INDIABULLS	Indiabulls Real Estate Limited
INDIACEM	The India Cements Limited
INDIANB	Indian Bank
IHCL	Indian Hotels Company Limited
IOB	Indian Overseas Bank
IGL	Indraprastha Gas Limited
INDUSINDBK	IndusInd Bank Limited
NAUKRI	Info Edge (India) Limited
INFY	Infosys Limited
INGERRAND	Ingersoll-Rand (India) Limited
INOXLEISUR	INOX Leisure Limited
IOC	Indian Oil Corporation Limited
IPCALAB	IPCA Laboratories Limited
IRB	IRB Infrastructure Developers Limited
ITC	ITC Limited
ITD	ITD Cementation India Limited
JAGRAN	Jagran Prakashan Limited
JAICORPLTD	Jai Corp Limited
JISLDVREQS	Jain Irrigation Systems Limited
JPOWER	Jaiprakash Power Ventures Limited
J&KBANK	Jammu and Kashmir Bank Limited
JBCHEPHARM	JB Chemicals & Pharmaceuticals Limited
JBFIND	JBF Industries Limited
JINDALSAW	Jindal Saw Limited
JSL	Jindal Stainless Limited
JINDALSTEL	Jindal Steel & Power Limited
JKCEMENT	JK Cement Limited
JKLAKSHMI	JK Lakshmi Cement Limited
JKTYRE	JK Tyre & Industries Limited
JKIL	J Kumar Infraprojects Limited
JMFINANCIL	JM Financial Limited
JSWENERGY	JSW Energy Limited
JSWHL	JSW Holdings Limited
JSWSTEEL	JSW Steel Limited

JUBLFOOD	Jubilant FoodWorks Limited
JUBILANTPHARMA	Jubilant Pharmova Limited
JUSTDIAL	Just Dial Limited
JYOTHYLAB	Jyothy Labs Limited
JYOTISTRUC	Jyoti Structures Limited
KAJARIACER	Kajaria Ceramics Limited
KPIL	Kalpataru Projects International Limited
KANSAINER	Kansai Nerolac Paints Limited
KTKBANK	Karnataka Bank Limited
KARURVYSYA	Karur Vysya Bank Limited
KSCL	Kaveri Seed Company Limited
KCP	The KCP Limited
KEC	KEC International Limited
KILPP	Kirloskar Industries Limited
KKCL	Kewal Kiran Clothing Limited
KITEX	Kitex Garments Limited
KNRCON	KNR Constructions Limited
KOLTEPATIL	Kolte-Patil Developers Limited
KOTAKBANK	Kotak Mahindra Bank Limited
KPITTECH	KPIT Technologies Limited
KPRMILL	KPR Mill Limited
KSB	KSB Limited
L&T	Larsen & Toubro Limited
LMW	Lakshmi Machine Works Limited
LAOPALA	La Opala RG Limited
LGBBROSLTD	LG Balakrishnan & Bros Limited
LICHSGFIN	LIC Housing Finance Limited
LINDEINDIA	Linde India Limited
LTF	L&T Finance Limited
LTIM	LTIMindtree Limited
LUPIN	Lupin Limited
M&M	Mahindra & Mahindra Limited
M&MFIN	Mahindra & Mahindra Financial Services Limited
POONAWALLA	Poonawalla Fincorp Limited
MAHSCOOTER	Maharashtra Scooters Limited
MAHSEAMLES	Maharashtra Seamless Limited
MHRIL	Mahindra Holidays & Resorts India Limited

MAHLIFE	Mahindra Lifespace Developers Limited
MANGCHEFER	Mangalore Chemicals & Fertilizers Limited
MRPL	Mangalore Refinery and Petrochemicals Limited
MARICO	Marico Limited
MARKSANS	Marksans Pharma Limited
MARUTI	Maruti Suzuki India Limited
MAXINDIA	Max India Limited
MAYURUNIQ	Mayur Uniquoters Limited
MBLINFRA	MBL Infrastructure Limited
MCDHOLDING	McDowell Holdings Limited
MCLEODRESS	McLeod Russel India Limited
MERCATOR	Mercator Limited
PGHL	Procter & Gamble Health Limited
MMTC	MMTC Limited
MOIL	MOIL Limited
MOTHERSON	Samvardhana Motherson International Limited
MOTILALOFS	Motilal Oswal Financial Services Limited
MPHASIS	Mphasis Limited
MRF	MRF Limited
MTEDUCARE	MT Educare Limited
MUNJALSHOW	Munjal Showa Limited
MUTHOOTFIN	Muthoot Finance Limited
NBCC	NBCC (India) Limited
NATIONALUM	National Aluminium Company Limited
NAVA	Nava Limited
NAVNETEDUL	Navneet Education Limited
NCC	NCC Limited
NDTV	New Delhi Television Limited
NETWORK18	Network18 Media & Investments Limited
NCL	NCL Industries Limited
NHPC	NHPC Limited
NIITLTD	NIIT Limited
NMDC	NMDC Limited
NOCIL	NOCIL Limited
NOIDATOLL	Noida Toll Bridge Company Limited
NTPC	NTPC Limited
OBEROIRLTY	Oberoi Realty Limited

OILINDIA	Oil India Limited
OMAXE	Omaxe Limited
ONGC	Oil and Natural Gas Corporation Limited
OPTOCIRCUI	Opto Circuits (India) Limited
ORACLE	Oracle Financial Services Software Limited
OSWALSEEDS	ShreeOswal Seeds and Chemicals Limited
PAGEIND	Page Industries Limited
PARSVNATH	Parsvnath Developers Limited
PATELENG	Patel Engineering Limited
PEL	Piramal Enterprises Limited
PENINLAND	Peninsula Land Limited
PENIND	Peninsula Industries LTD
PERSISTENT	Persistent Systems Limited
PETRONET	Petronet LNG Limited
PFC	Power Finance Corporation Limited
PFIZER	Pfizer Limited
PGHH	Procter & Gamble Hygiene and Health Care Limited
PHOENIX	The Phoenix Mills Limited
PIDILITE	Pidilite Industries Limited
PIIND	PI Industries Limited
PNB	Punjab National Bank
POWERGRID	Power Grid Corporation of India Limited
PRAJIND	Praj Industries Limited
PRAKASH	Prakash Industries Limited
PRESTIGE	Prestige Estates Projects Limited
PRISMJOHNSN	Prism Johnson Limited
PFS	PTC India Financial Services Limited
PTC	PTC India Limited
PURVA	Puravankara Limited
PVR	PVR Limited
RADICO	Radico Khaitan Limited
RAJESHEXPO	Rajesh Exports Limited
RALLIS	Rallis India Limited
RAMCOIND	Ramco Industries Limited
RCF	Rashtriya Chemicals and Fertilizers Limited
RATNAMANI	Ratnamani Metals & Tubes Limited
RTNINDIA	RattanIndia Enterprises Limited

RAYMOND	Raymond Limited
REC	REC Limited
REDINGTON	Redington Limited
RELIANCE	Reliance Industries Limited
RELCAPITAL	Reliance Capital Limited
RCOM	Reliance Communications Limited
RELINFRA	Reliance Infrastructure Limited
RPOWER	Reliance Power Limited
RELIGARE	Religare Enterprises Limited
REPCOHOME	Repco Home Finance Limited
ROLTA	Rolta India Limited
SADBHAV	Sadbhav Engineering Limited
SAI	Sai Silks (Kalamandir) Limited
SANOFI	Sanofi India Limited
SBI	State Bank of India
SEINVEST	S E Investments Limited
SHANTIGEAR	Shanthi Gears Limited
SCI	Shipping Corporation of India
SHOPPERSTOP	Shoppers Stop Limited
SHREECEM	Shree Cement Limited
RENUKA	Shree Renuka Sugars Limited
SRTRANS	Shriram Transport Finance Company Limited
SIEMENS	Siemens Limited
SIMPLEXINF	Simplex Infrastructures Limited
SKFINDIA	SKF India Limited
SOBHA	Sobha Limited
JTEKT	JTEKT India Limited
SONATASOFTW	Sonata Software Limited
SOUTHBANK	The South Indian Bank Limited
SREINFRA	SREI Infrastructure Finance Limited
SRF	SRF Limited
SRIRAMFIN	Shriram Finance Limited
STLTECH	Sterlite Technologies Limited
SUNDRMFAST	Sundram Fasteners Limited
SUNDARAMFIN	Sundaram Finance Limited
SUNPHARMA	Sun Pharmaceutical Industries Limited
SPARC	Sun Pharma Advanced Research Company Limited

SUNTECH	Sunteck Realty Limited
SUNTV	Sun TV Network Limited
SUPREMEIND	Supreme Industries Limited
SPLPETRO	Supreme Petrochem Limited
SUVEN	Suven Pharmaceuticals Limited
SUZLON	Suzlon Energy Limited
SWANCORP	Swan Energy Limited
SWARAJENG	Swaraj Engines Limited
TNPL	Tamil Nadu Newsprint and Papers Limited
TATACHEM	Tata Chemicals Limited
TATACOFFEE	Tata Coffee Limited
TATACOM	Tata Communications Limited
TATACONSUM	Tata Consumer Products Limited
TATAELXSI	Tata Elxsi Limited
TATAINVEST	Tata Investment Corporation Limited
TATAMOTORS	Tata Motors Limited
TATAPOWER	Tata Power Company Limited
TATASTLLP	Tata Steel Long Products Limited
TATASTEEL	Tata Steel Limited
TCS	Tata Consultancy Services Limited
TDPOWERSYS	TD Power Systems Limited
TECHM	Tech Mahindra Limited
ORISSAIND	The Orissa Minerals Development Company Limited
RAMCOCEM	The Ramco Cements Limited
THERMAX	Thermax Limited
THOMASCOOK	Thomas Cook (India) Limited
TITAN	Titan Company Limited
TORNTPHARM	Torrent Pharmaceuticals Limited
TORNTPOWER	Torrent Power Limited
TREEHOUSE	Tree House Education & Accessories Limited
TRENT	Trent Limited
TBZ	Tribhovandas Bhimji Zaveri Limited
TRIDENT	Trident Limited
TTKPRESTIG	TTK Prestige Limited
TV18BRDCST	TV18 Broadcast Limited
TVSMOTOR	TVS Motor Company Limited
TVTODAY	TV Today Network Limited

UBL	United Breweries Limited
UCOBANK	UCO Bank
UFLEX	Uflex Limited
ULTRACEMCO	UltraTech Cement Limited
UNICHEMLAB	Unichem Laboratories Limited
UNIONBANK	Union Bank of India
UPL	UPL Limited
USHAMART	Usha Martin Limited
UTTAMSTL	Uttam Galva Steels Limited
VAIBHAVGBL	Vaibhav Global Limited
VAKRANGEE	Vakrangee Limited
VTLLTD	Vardhman Textiles Limited
WABAG	VA Tech Wabag Limited
VEDL	Vedanta Limited
VESUVIUS	Vesuvius India Limited
VINATIORGA	Vinati Organics Limited
VIPIND	VIP Industries Limited
VOLTAS	Voltas Limited
VSTIND	VST Industries Limited
WABCO	WABCO India Limited
WELCORP	Welspun Corp Limited
WELSPUNLIV	Welspun Living Limited
WHEELS	Wheels India Limited
WHIRLPOOL	Whirlpool of India Limited
WIPRO	Wipro Limited
WOCKPHARMA	Wockhardt Limited
YESBANK	Yes Bank Limited
ZEEL	Zee Entertainment Enterprises Limited
ZENSARTECH	Zensar Technologies Limited
ZYDUSLIFE	Zydus Lifesciences Limited
ZYDUSWELL	Zydus Wellness Limited