UNIVERSITY OF CALICUT

CERTIFICATE ON PLAGIARISM CHECK

1.	Name of the research scholar	DARSANA SUDHARSAN		
2.	Title of thesis/dissertation	An Analysis of Behavioural Bias and Investment Performance among Equity Mutual Fund Investors in Kerala		
3.	Name of the supervisor	Dr. BIJU JOHN M		
4.	Department/Institution	Research and PG Department of Commerce St. Thomas' College (Autonomous) Thrissur-68001		
5.	Similar content (%)identified	**Introduction/ Review of literature**	**Materials and Methods**	**Result/ Discussion/Summary/ Conclusion**
		0%	**0%**	**0%**
	Acceptable maximum limit (%)	35	25	10
6.	Software used	Ouriginal		
7.	Date of verification	1/2/2023		

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

Checked by (with name, designation & Signature) Dr. VINOD V.M. Assistant Librarian (Sl.Grade) University of Calicut

Name and signature of the Researcher: Darsana Sudharsan

Name & Signature of the Supervisor DR. BIJU JOHN M.

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) 07-02-23

Dr. Martin K. A. Principal-in-Charge St Thomas College (Autonomous) Thrissur - 680 001

ST THOMAS' COLLEGE (AUTONOMOUS), THRISSUR-1

** 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*

Dr. Biju John M.
Dean, Professor and Head
Research Department of Commerce
St Thomas College Autonomous
Thrissur, Kerala-680001
9447448568
drbijujohnm@gmail.com

Member of the Senate
University of Calicut

Certificate

*This is to certify that, the thesis entitled '**An Analysis of Behavioural Bias and Investment Performance among Equity Mutual Fund Investors in Kerala**' is a record of the bonafide research work done by Ms. Darsana Sudharsan, Full-time Research Scholar, under my supervision and guidance.*

The thesis is the outcome of her original work and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or any other similar title and is worth submitting for the award of the Degree of Doctor of Philosophy in Commerce under the Faculty of Commerce and Management Studies, University of Calicut.

Dr. Biju John M

Supervising Teacher

Dr. Biju John M.
Dean, Professor and Head
Research Department of Commerce
St Thomas College Autonomous
Thrissur, Kerala-680001
9447448568
drbijujohnm@gmail.com

Member of the Senate
University of Calicut

Certificate

This is to certify that the adjudicators of the PhD thesis of Ms. Darsana Sudharsan, titled ***'An Analysis of Behavioural Bias and Investment Performance among Equity Mutual Fund Investors in Kerala'*** have not given any directions for corrections or suggestions for change in their reports. The contents of the CD are the same as in the hard copy.

Dr. Biju John M

Supervising Teacher

Declaration

I hereby declare that this thesis entitled *'An Analysis of Behavioural Bias and Investment Performance among Equity Mutual Fund Investors in Kerala*', submitted to the University of Calicut, for the award of the Degree of Doctor of Philosophy in Commerce, is a record of the bonafide research work done by me under the supervision and guidance of Dr. Biju John M, Professor and Head, Research and PG Department of Commerce, St. Thomas' College (Autonomous) Thrissur. I also declare that, this thesis has not been formed the basis for the award of any degree, diploma, associateship, fellowship or any other title of recognition from any university or institution and to the best of my knowledge and belief, it contains no material previously published by any other person, except where due references are made in the text of the thesis.

Darsana Sudharsan

Thrissur

Date

Acknowledgement

Ph.D has been a truly life changing experience for me, and it would not have been possible to do without the support and guidance that I received from many people.

Words fall short in my lexicon to express my heartfelt admiration and gratitude to my research supervisor and mentor, Dr. Biju John M, Professor and Head, Research Department of Commerce, St. Thomas' College (Autonomous), Thrissur, who has offered the inspirational guidance, support and encouragement during my research work. The subject knowledge and experience he possesses, was phenomenally stimulating for me. I feel much fortunate to have pursued my Ph.D under his benign supervision. I am deeply indebted to him for giving me an opportunity to pursue Ph.D under his guidance.

I express my deep gratitude to the University Grants Commission for the financial assistance (JRF/SRF) extended for my research work. I express my sincere thanks to the former Head of the Department, Dr. Thomas Paul Kattookkaran and the entire faculty of the Research Department of Commerce for their valuable support and sincere co-operation throughout the period of my research work. I am extremely grateful to the former Principals, Dr. Joy K L, Dr. Ignatius Antony, Dr. Jenson P.O and the present Principal-in-charge Fr. Dr. Martin K A for arranging all facilities in the college for my research work.

I owe much to Dr. V M Chacko-Research Council Coordinator, Dr. Xavier Joseph, VC Nominee and Associate Professor, Department of Physics, Christ College, Irinjalakkuda and all other doctoral committee members for their constant support.

I am very thankful to Dr. Aparna Sajeev, Expert Member of the Doctoral Committee, Dr. B Johnson, Dean of the Department of Commerce and Management Studies and Dr. M A Joseph, Former Head, Department of Commerce and Management Studies, University of Calicut for the valuable directions and comments given during my research work. A special thanks to Dr. Vinod V. M., Librarian, C.H.M.K., for all the facilities and guidance provided for the plagiarism checking of my thesis. I also thank all other faculties in the Department of Commerce, University of Calicut. I express my gratitude to the Director of Research of University of Calicut and the whole team, for all the facilities provided for undertaking the research.

I am extremely grateful to Dr. Sindhu K P, Principal-in-charge NSS College Parakkulam for her valuable suggestions and being a guiding light in my research. I also thank Dr. Sam Thomas, Professor, Cochin University of Science and Technology for the encouragement and support given during my research.

I would like to specially mention the selfless efforts of Dr. Tom Jacob, Assistant professor, Christ College (Autonomous), Irinjalakuda and Dr. Nishija Unnikrishnan whose guidance and suggestions enhanced the quality of my research work. I wish to extend my sincere thanks to the Librarian Mr. Sanjo Jose and all other administerial staff of St Thomas' College (Autonomous), Thrissur for all the facilities given during my research.

I would like to thank my friends, Dr. Anoop K G, Remya R, Urmila R Menon, Athira J, Harishma C, Choondal Alfred Deepthi and Midhunlal M M for their unconditional support and motivation.

My study would not have been completed without the blessings of my parents Mr. Sudharsan N P and Mrs. Seena V C. I remember with love my sisters Nimisha Sudharsan and Drisya Sudharsan who constantly encouraged me throughout my research. I would like to remember gratefully the love and support of my father in law Mr. Wilson P, mother in law Mrs. Valsa Wilson, brother-in-law Mr. Arun Paul, sister-in-law Mrs. Anisha Vincent E and my loving niece Alaida Paul.

I am extremely thankful to my husband, Mr. Ajith K W, who stood by me during the ups and downs of my journey and without his love, support and tolerance, this work would not have been possible.

Above all, I express my unlimited gratefulness to the Lord Almighty for the endless blessings showered upon me for the successful completion of my research work.

Darsana Sudharsan

LIST OF TABLES

Table No.		Page No.
3.1	Variables Used for the Study	57
3.2	Reliability Analysis	58
3.3	Kolmogorov-Smirnov Test of Nomality	59
3.4	Skewness and Kurtosis Results	60
4.1	ADF Test Results of Sensex and Equity Mutual Funds in India	67
4.2	Optimal Lag Selection of Large-cap Funds and Sensex	68
4.3	Optimal Lag Selection of Large and Mid-cap Funds and Sensex	68
4.4	Optimal Lag Selection of Mid-cap Funds and Sensex	69
4.5	Optimal Lag Selection of Small-cap Funds and Sensex	69
4.6	Johansen's Co-integration Test - Large-cap Funds and Sensex	71
4.7	Johansen's Co-integration Test - Large and Mid-cap Funds and Sensex	71
4.8	Johansen's Co-integration Test - Mid-cap Funds and Sensex	72
4.9	Johansen's Co-integration Test - Small-cap Funds and Sensex	72
4.10	Normalised Co-integrating Coefficients of Sensex and Large-cap Funds	73
4.11	Estimates of Error Correction Term c(1) - Large-cap Funds and Sensex	74
4.12	Normalised Co-integrating Coefficients of Sensex and Large and Mid-cap Funds	74
4.13	Estimates of Error Correction Term c(1) - Large and Mid-cap Funds and Sensex	75
4.14	Normalised Co-integrating Coefficients of Sensex and Mid-cap Funds	76
4.15	Estimates of Error Correction Term c(1) - Mid-cap Funds and Sensex	76
4.16	Normalised Co-integrating Coefficients of Sensex and Small-cap Funds	77
4.17	Estimates of Error Correction Term c(1) - Small-cap Funds and Sensex	77

4.18	Granger Causality Test Results	78
4.19	Variance Decomposition Analysis of Large-cap Funds and Sensex	79
4.20	Variance Decomposition Analysis of Large and Mid-cap Funds and Sensex	80
4.21	Variance Decomposition Analysis of Mid-cap Funds and Sensex	80
4.22	Variance Decomposition Analysis of Small-cap Funds and Sensex	81
5.1	ADF Test Results of Performance of Equity Mutual Funds in India	94
5.2	ARMA Model Selection Criteria of Performance of Large-cap funds	95
5.3	ARMA Maximum Likelihood Estimation of Performance of Large-cap funds	98
5.4	ARMA Model Selection Criteria of Performance of Large and Mid-cap funds	99
5.5	ARMA Maximum Likelihood Estimation of Performance of Large and Mid-cap funds	102
5.6	ARMA Model Selection Criteria of Performance of Mid-cap funds	103
5.7	ARMA Maximum Likelihood Estimation of Performance of Mid-cap funds	106
5.8	ARMA Model Selection Criteria of Performance of Small-cap funds	107
5.9	ARMA Maximum Likelihood Estimation of Performance of Small-cap funds	110
6.1	Gender-wise Classification of Sample Investors	123
6.2	Age-wise Classification of Sample Investors	123
6.3	Place of Domicile-wise Classification of Sample Investors	124
6.4	Marital Status-wise Classification of Sample Investors	124
6.5	Education-wise Classification of Sample Investors	125

6.6	Occupation-wise Classification of Sample Investors	125
6.7	Income-wise Classification of Sample Investors	126
6.8	Mutual fund Investment-wise Classification of Sample Investors	126
6.9	Mutual Fund Investment Mode-wise Classification of Sample Investors	127
6.10	Investment Experience-wise Classification of Sample Investors	128
6.11	Statements of Behavioural Bias	129
6.12	Descriptive Statistics of Different Types of Behavioural Bias	130
6.13	Gender-wise Analysis of Behavioural Bias	131
6.14	Gender-wise Analysis of Types of Behavioural Bias	132
6.15	Age-wise Test of Homogeneity of Variances of Behavioural Bias	133
6.16	Age-wise Analysis of Behavioural Bias	133
6.17	Age-wise Test of Homogeneity of Variances of Types of Behavioural Bias	134
6.18	Age-wise Analysis of Types of Behavioural Bias	135
6.19	Education-wise Test of Homogeneity of Variances of Behavioural Bias	136
6.20	Education-wise Analysis of Behavioural Bias	136
6.21	Education-wise Post Hoc Test – Behavioural Bias	137
6.22	Education-wise Test of Homogeneity of Variances of Types of Behavioural Bias	138
6.23	Education-wise Analysis of Types of Behavioural Bias	138
6.24	Education-wise Post Hoc Test – Belief Perseverance Bias	139
6.25	Education-wise Post Hoc Test – Information Processing Bias	140
6.26	Education-wise Post Hoc Test – Emotional Bias	141
6.27	Occupation-wise Test of Homogeneity of Variances of Behavioural Bias	142
6.28	Occupation-wise Analysis of Behavioural Bias	143
6.29	Occupation-wise Post Hoc Test – Behavioural Bias	143
6.30	Occupation-wise Test of Homogeneity of Variances of Types of	144

	Behavioural Bias	
6.31	Occupation-wise Analysis of Types of Behavioural Bias	145
6.32	Occupation-wise Post Hoc Test – Information Processing Bias	146
6.33	Occupation-wise Post Hoc Test – Emotional Bias	147
6.34	Marital Status-wise Analysis of Behavioural Bias	148
6.35	Marital Status-wise Analysis of Types of Behavioural Bias	149
6.36	Income-wise Test of Homogeneity of Variances of Behavioural Bias	149
6.37	Income-wise Analysis of Behavioural Bias	150
6.38	Income-wise Post Hoc Test – Behavioural Bias	150
6.39	Income-wise Test of Homogeneity of Variances - Types of Behavioural Bias	151
6.40	Income-wise Analysis of Types of Behavioural Bias	152
6.41	Income-wise Post Hoc Test – Information Processing Bias	153
6.42	Income-wise Post Hoc Test – Emotional Bias	154
6.43	Investment Experience-wise Test of Homogeneity of Variances of Behavioural Bias	155
6.44	Investment Experience-wise Analysis of Behavioural Bias	155
6.45	Investment Experience-wise Post Hoc Test – Behavioural Bias	156
6.46	Investment Experience-wise Test of Homogeneity of Variances of Types of Behavioural Bias	157
6.47	Investment Experience-wise Analysis of Types of Behavioural Bias	157
6.48	Investment Experience-wise Post Hoc Test – Belief Perseverance Bias	158
6.49	Investment Experience-wise Post Hoc Test – Information Processing Bias	159
6.50	Descriptive Statistics of Sub-Types of Behavioural Bias	163
6.51	Gender-wise Analysis - Sub-Types of Behavioural Bias	164
6.52	Age-wise Test of Homogeneity of Variances - Sub-Types of Behavioural Bias	167
6.53	Age-wise Analysis - Sub-Types of Behavioural Bias	168

6.54	Education-wise Test of Homogeneity of Variances - Sub-Types of Behavioural Bias	171
6.55	Education-wise Analysis - Sub-Types of Behavioural Bias	171
6.56	Occupation-wise Test of Homogeneity of Variances - Sub-Types of Behavioural Bias	176
6.57	Occupation-wise Analysis - Sub-Types of Behavioural Bias	177
6.58	Marital Status-wise Analysis - Sub-Types of Behavioural Bias	181
6.59	Income-wise Test of Homogeneity of Variances - Sub-Types of Behavioural Bias	184
6.60	Income-wise Analysis - Sub-Types of Behavioural Bias	185
6.61	Investment Experience-wise Test of Homogeneity of Variances - Sub-Types of Behavioural Biases	188
6.62	Investment Experience-wise Analysis - Sub-Types of Behavioural Bias	189
7.1	Statements of Investment Performance	204
7.2	Gender-wise Analysis of Investment Performance	205
7.3	Age-wise Test of Homogeneity of Variances of Investment Performance	206
7.4	Age-wise Analysis of Investment Performance	206
7.5	Education-wise Test of Homogeneity of Variances of Investment Performance	207
7.6	Education-wise Analysis of Investment Performance	207
7.7	Occupation-wise Test of Homogeneity of Variances of Investment Performance	208
7.8	Occupation-wise Analysis of Investment Performance	208
7.9	Marital Status-wise Analysis of Investment Performance	209
7.10	Income-wise Test of Homogeneity of Variances of Investment Performance	210
7.11	Income-wise Analysis of Investment Performance	210
7.12	Investment Experience-wise Test of Homogeneity of Variances of Investment Performance	211

7.13 Investment Experience-wise Analysis of Investment Performance 211
7.14 Multiple Regression Analysis showing Influence of Behavioural Bias on Investment Performance 212

Table No.	LIST OF FIGURES	Page No.
4.1	Impulse Response Analysis - Large-cap Funds and Sensex	82
4.2	Impulse Response Analysis - Large and Mid-cap Funds and Sensex	83
4.3	Impulse Response Analysis - Mid-cap Funds and Sensex	84
4.4	Impulse Response Analysis - Small-cap Funds and Sensex	85
5.1	Mutual fund AUM (as % of GDP)	88
5.2	Scheme-wise composition of Assets	88
5.3	Performance of Equity Mutual Funds during 2011-2021	90
5.4	ARMA Model of Performance of Large-cap funds	96
5.5	Forecast Comparison Graph of Performance of Large-cap funds	97
5.6	ARMA Model of Performance of Large and Mid-cap funds	100
5.7	Forecast Comparison Graph of Performance of Large and Mid-cap funds	101
5.8	ARMA Model of Performance of Mid-cap funds	104
5.9	Forecast Comparison Graph of Performance of Mid-cap funds	105
5.10	ARMA Model of Performance of Small-cap funds	108
5.11	Forecast Comparison Graph of Performance of Small-cap funds	109
5.12	Actual and Fitted Comparison graph of Large-cap funds	111
5.13	Residual Plot of Large-cap funds	111
5.14	Actual and Fitted Comparison graph of Large and Mid-cap funds	112
5.15	Residual Plot of Large and Mid-cap funds	112
5.16	Actual and Fitted Comparison graph of Mid-cap funds	113
5.17	Residual Plot of Mid-cap funds	113
5.18	Actual and Fitted Comparison graph of Small-cap funds	114
5.19	Residual Plot of Small-cap funds	114
5.20	Actual and Forecast graph of Large-cap funds	116
5.21	Actual and Forecast graph of Large and Mid-cap funds	117
5.22	Actual and Forecast graph of Mid-cap funds	118
5.23	Actual and Forecast graph of Small-cap funds	119

Abbreviations

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criterion
AMC	Asset Management Company
AMFI	Association of Mutual Funds in India
ANOVA	Analysis of Variance
ARIMA	Auto Regressive Integrated Moving Average
AUM	Assets Under Management
BIC	Bayesian Information Criterion
BSE	Bombay Stock Exchange
CAGR	Compound Annual Growth Rate
COVID-19	Coronavirus Disease of 2019
CRISIL	Credit Rating Information Services of India Limited
ECM	Error Correction Model
ECT	Error Correction Term
ELSS	Equity Linked Savings Scheme
EMH	Efficient Market Hypothesis
ETF	Exchange Traded Fund
FDI	Foreign Direct Investment
FIIs	Foreign Institutional Investors
FoF	Fund of Fund
GDP	Gross Domestic Product
HQ	Hannan-Quinn's Information Criterion
IDBI	Industrial Development Bank of India
IMF	International Monetary Fund
KMO	Kaiser-Meyer-Olkin
LR	Log Likelihood Ratio
MF	Mutual Fund
MOSPI	Ministry of Statistics and Programme Implementation
NAV	Net Asset Value
NDA	National Democratic Alliance

NPA	Non-Performing Asset
NSE	National Stock Exchange
RBI	Reserve Bank of India
RERA	Real Estate (Regulation and Development) Act
S.E	Standard Error
SBI	State Bank of India
SD	Standard Deviation
SEBI	Securities Exchange Board of India
SIC	Schwarz Information Criteria
SIP	Systematic Investment Plan
SPSS	Statistical Package for Social Science
VAR	Vector Auto Regression
VECM	Vector Error Correction Model
UTI	Unit Trust of India