

## DOCTORAL THESIS

# Stock market overreaction and underreaction: theoretical explanations and empirical evidences

Liu, Taisheng

*Date of Award:*  
2006

[Link to publication](#)

### General rights

Copyright and intellectual property rights for the publications made accessible in HKBU Scholars are retained by the authors and/or other copyright owners. In addition to the restrictions prescribed by the Copyright Ordinance of Hong Kong, all users and readers must also observe the following terms of use:

- Users may download and print one copy of any publication from HKBU Scholars for the purpose of private study or research
- Users cannot further distribute the material or use it for any profit-making activity or commercial gain
- To share publications in HKBU Scholars with others, users are welcome to freely distribute the permanent URL assigned to the publication

Stock Market Overreaction and Underreaction:  
Theoretical Explanations and Empirical Evidences

LIU Taisheng

A thesis submitted in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy

Principal Supervisor: Prof. LAM Kin

Hong Kong Baptist University

August 2006

## Abstract

This dissertation concentrates on two aspects of the studies in stock market underreaction and overreaction. In the first part of the thesis, we construct a theoretical model for investor's representativeness and conservatism heuristics. Our model contributes to the studies in behavioral finance in three aspects: (1) we provide quantitative expressions for investor's conservatism and representativeness heuristics in a single model; (2) Our model provides theoretical supports for the empirical findings about underreaction and overreaction; (3) This model is consistent with a property for the underreaction and overreaction, i.e. the 'magnitude effect' or the second part of the under- overreaction hypothesis. In the second part of the thesis, we provide empirical evidences on the second part of the under- overreaction hypothesis. We use several methods to confirm the second part of under- overreaction hypothesis.

# Table of Contents

Declaration.....	i
Abstract.....	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Tables.....	vii
List of Figures.....	viii
Introduction.....	1
Part One: Alternative Models That Can Explain Market Under- and Overreaction.....	2
1. Introduction.....	2
2. Literature Review.....	8
2.1. An Overview of Underreaction and Overreaction.....	8
2.2. Empirical Findings on Overreaction.....	9
2.3. Empirical Findings on Underreaction.....	12
2.4. Empirical Results on Overreaction and Underreaction After a News Event....	14
2.5. Representativeness, Conservatism Heuristics.....	16
2.6. Explanations for Overreaction and Underreaction.....	21
2.6.1 Explanations within the Efficient Market Paradigm.....	21
2.6.2 Review of Behavioral Models.....	24
3. New Behavioral Models Reflecting Investor's Conservatism and Representativeness Heuristics.....	31
3.1. An Extension of BSV's Model.....	31
3.2. Modeling Behavioral Biases as Incorrect Bayesian Methodology.....	34

3.2.1	The Standard Bayesian Approach.....	37
3.2.2	A Pseudo Bayesian Approach Reflecting Conservatism.....	38
3.2.3	A Pseudo Bayesian Approach Reflecting Representativeness .....	39
3.2.4	A Pseudo Bayesian Approach Reflecting both Conservatism and Representativeness.....	41
3.3.	Measures of Under- and Overreaction.....	44
3.3.1	Under- and Overreaction In Terms of Autocorrelations.....	45
3.3.2	Under- and Overreaction In Terms of Past Earning Shocks.....	46
4.	Over- and Underreaction under the Four Behavioral Models .....	49
4.1.	Some General Expressions .....	49
4.2.	Investor Using a Correct Bayesian Approach.....	59
4.3.	Conservatism .....	64
4.4.	Representativeness.....	69
4.5.	Conservatism and Representativeness .....	75
5.	Theoretical Supports for the Second Part of the Under- and Overreaction .....	84
5.1.	The Second Part of the Under- and Overreaction Hypothesis.....	84
5.2.	A Formal Definition of the Second Part of the Under- and Overreaction Hypothesis .....	88
5.3.	The Magnitude Effect Supported by Behavioral Models .....	89
6.	Conclusion .....	92
Part Two: The Second Part of the Under- and Overreaction Hypothesis .....		96
1.	Introduction.....	96
2.	Data .....	100
3.	Methodology .....	102

3.1.	Rank Correlations Test .....	103
3.2.	Extreme Winner-Loser Portfolio Versus Mild Winner-Loser Portfolio.....	106
3.3.	Ordered Alternative Test .....	108
3.4.	Comparison of the Magnitude-weighted and Equal-weighted Portfolios .....	111
4.	Empirical Results.....	115
4.1.	Rank Correlation Test.....	115
4.2.	Extreme Winner-Loser Portfolio and Mild Winner-Loser Portfolio.....	118
4.3.	Ordered Alternative Test .....	121
4.4.	Equal-Weighted Versus Magnitude-Weighted Portfolios .....	125
5.	Risk-Adjusted Results.....	129
5.1.	Results of Extreme Winner-Loser versus Mild Winner-Loser Portfolios .....	130
5.2.	Results of Ordered Alternative Test .....	132
5.3.	Results of Magnitude-Weighted Portfolio and Equal-Weighted Portfolio.....	133
6.	Conclusion .....	136
	Bibliography: .....	138
	Appendix I .....	148
	A.    Bayesian Inference.....	148
	B.    Lemma 5: .....	152
	Appendix II .....	155
	C.    Uniform distribution and Chi-test.....	155
	CURRICULUM VITAE.....	157