

MASTER'S THESIS

What determine the information shares in the price discovery process between the index futures and the underlying cash index?

Cheng, Ka Wan

Date of Award:
2008

[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

**What Determine the Information Shares in the Price Discovery
Process Between the Index Futures and the Underlying Cash Index?**

CHENG Ka Wan

A thesis submitted in partial fulfillment of the requirements

for the degree of

Master of Philosophy

Principal Supervisor: Prof. Joseph K.W. FUNG

Hong Kong Baptist University

February 2008

ABSTRACT

This research examines the intraday price discovery process between the Hang Seng Index (HSI) futures contract and the underlying cash index. The study uses high frequency intraday transaction data of the futures, the minute-by-minute reported index value, and the mid-quote index based on synchronous bid and ask quotes of all the component stocks of the index. Hasbrouck's (1995) information share model and the permanent transitory model of Gonzalo and Granger (1995) are adopted in the study. The mid-quote index is used to purge for the potential effects of non-synchronous trading in the reported index. To test for the impact of overall market conditions on the results, the study examines the relatively calm period right before the Asian financial crisis and the financial crisis period.

The results show that futures dominate the cash index in price discovery throughout the sample periods. Both the information share and common factor of futures decrease gradually from the pre-crisis period to the crisis period and revert back to the level in the pre-crisis period after the financial crisis. Decreasing the sampling frequency from once every minute to once every five minutes, the information share of futures decline. However, the common factor measure is less sensitive to changes in sampling frequency. Finally, the paper finds that short-selling activities in index stocks, relative liquidity and the relative volatility between the futures and cash index returns significantly affect the information shares between the two markets.

TABLE OF CONTENTS

Declaration.....	i
Abstract.....	ii
Acknowledgements.....	iii
Table of contents.....	iv
List of Tables.....	vi
List of figures.....	viii
Chapter 1	
Introduction.....	1
Chapter 2	
Literature Review and Hypothesis.....	4
2.1 Hasbrouck’s (1995) information share model and Gonzalo and Granger’s (1995) permanent-transitory model	4
2.2 Factors affecting price discovery process.....	8
2.2.1 Level of index short sale activities.....	8
2.2.2 Market-wide information versus firm-specific information.....	10
2.2.3 Relative liquidity and transaction costs of the markets.....	11
2.2.4 Market Volatility.....	12
2.2.5 Non-synchronous trading in index stocks.....	13
Chapter 3	
Data and Methodology	
3.1 Data.....	15
3.2 Construction of the mid-quote index.....	16
3.3 The sample periods.....	17
3.4 Measure of relative trading volume between the cash and futures markets.....	18
3.5 Computation of index short selling figures.....	19
3.6 Computation of realized volatility of futures, reported index and mid-quote index.....	19

3.7 Computation of Information share and Gonzalo-Granger Common Factor Weights.....	20
3.8 Regression Analysis.....	21
Chapter 4	
Empirical Results and Interpretation	
4.1 Descriptive statistics of market variables.....	23
4.1.1 Relative trading volume between cash and futures markets.....	23
4.1.2 Short selling of index stocks.....	24
4.1.3 Daily realized volatility of index futures, spot index and mid-quote index.....	25
4.2 Information Share and Common factor weights.....	27
4.2.1 Information share of futures in different periods.....	27
4.2.2 Factors affecting information share of futures markets.....	28
4.2.3 Information share versus common factor weights.....	29
4.2.4 Effects of correlation of residuals on information share.....	31
4.2.5 Effects of changes in sampling frequency.....	32
4.2.6 Effects of non-synchronous trading in index stocks.....	33
4.3 Regression Analysis.....	34
Chapter 5	
Conclusion	
5.1 Contribution.....	38
5.2 Suggestion for Future Research.....	41
Appendix	42
References.....	69
Curriculum Vitae.....	72