

**A MULTIDIMENSIONAL STUDY OF WEAK-FORM EFFICIENCY FOR FINANCE STOCKS IN MALAYSIA**

**KOK SOOK CHING**



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UNIVERSITI MALAYSIA SABAH

**FACULTY OF BUSINESS, ECONOMICS AND  
ACCOUNTANCY  
UNIVERSITI MALAYSIA SABAH  
2017**

**A MULTIDIMENSIONAL STUDY OF WEAK-  
FORM EFFICIENCY FOR FINANCE STOCKS IN  
MALAYSIA**

**KOK SOOK CHING**

**THESIS SUBMITTED IN FULFILLMENT FOR  
THE DEGREE OF DOCTOR OF PHILOSOPHY  
(FINANCIAL ECONOMICS)**



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2017**

**UNIVERSITI MALAYSIA SABAH**

**BORANG PENGESAHAN STATUS THESIS**

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UNTUK SAHAM-SAHAM KEWANGAN DI MALAYSIA**

**IJAZAH: DOCTOR OF PHILOSOPHY (FINANCIAL ECONOMICS)**

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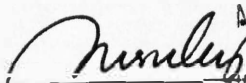
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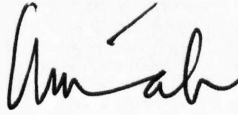
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**Prof. Madya Dr Qaiser Munir**  
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**Prof. Dr Arsiah Bahron**  
Penyelia Bersama

**DR. HJH. ARSIAH HJ. BAHRON**  
PROFESOR  
FAKULTI PERNIAGAAN, EKONOMI DAN PERAKAUNAN  
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## DECLARATION

I hereby declare that the material in this thesis is my own except for quotations, excerpts, equations, summaries and references, which have been duly acknowledged.

10 March 2017



---

Kok Sook Ching

DB1311003T



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## CERTIFICATION

NAME : **KOK SOOK CHING**  
MATRIC NO : **DB1311003T**  
TITLE : **A MULTIDIMENSIONAL STUDY OF WEAK-FORM  
EFFICIENCY FOR FINANCE STOCKS IN  
MALAYSIA**  
DEGREE : **DOCTOR OF PHILOSOPHY (FINANCIAL  
ECONOMICS)**  
VIVA DATE : **12<sup>th</sup> FEBRUARY 2017**

**DECLARED BY;**

**1. MAIN SUPERVISOR**

Associate Professor Dr Qaiser Munir



Signature

A handwritten signature in black ink, appearing to read 'Qaiser Munir', written over a horizontal line.

**DR. QAISER MUNIR**

Associate Professor

Faculty of Business, Economics and Accounting  
Universiti Malaysia Sabah

**2. CO-SUPERVISOR**

Professor Dr Arsiah Bahron

A handwritten signature in black ink, appearing to read 'Arsiah Bahron', written over a horizontal line.

**DR. HJH. ARSIAH HJ. BAHRON**

PROFESOR

FAKULTI PERNIAGAAN, EKONOMI DAN PERAKAUNAN  
UNIVERSITI MALAYSIA SABAH.

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Foremost, I am thankful for God's blessings which give me strength to overcome many obstacles throughout my study.

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Kok Sook Ching  
13 March 2017

## ABSTRACT

Finance sector plays a vital role in financial system. Nevertheless, it is exposed to systematic default risk, bank run, and shocks emanating from financial system. This thesis primarily aims to determine the weak-form efficiency for finance stocks in Malaysia, covering financial holding companies, commercial banks, investment banks, insurance companies, capital market intermediaries, and finance companies. The specific objectives of this study are: to examine the random walk properties for finance stock prices in Malaysia based on a random walk model that incorporates cross-sectional dependence (CD) and structural breaks; to examine nonlinearity and threshold effect of finance stock prices in Malaysia through a two-regime threshold autoregressive (TAR) approach, allowing for evaluating the random walk properties in separate regimes; to investigate the existence of calendar anomalies in the market of finance stocks in Malaysia by focusing on the day-of-the-week effect, month-of-the-year effect, turn-of-the-month (TOM) effect, and holiday effect; and to investigate the presence of short-term momentum effect and return reversal in the market of finance stocks in Malaysia. This study shows the following findings: 1) The prices of all finance stocks follow a random walk process hence weak-form efficiency is validated; 2) There is strong CD among the cross-sectional units of financial firms in Malaysia; 3) Each finance stock price series displays several structural changes throughout the study period; 4) The prices of all finance stocks are nonlinear and showing the threshold effect, thus reflecting basic human psychological influence that causes tension threshold and changing behaviour of efficiency across different regimes in the finance stock prices. The finance stocks are either fully or partially complying with the random walk properties and weak-form efficiency; 5) Calendar anomalies occur in the market of finance stocks; 6) Short-term momentum effect and return reversal exist in the market of finance stocks, in which they are unexplainable within the efficient market paradigm; 7) As calendar anomalies, short-term momentum effect and return reversals are evident, the weak-form efficiency in short-term is invalid. The above findings suggest that the selected finance stocks in Malaysia are efficient in the weak-form sense based on a random walk model that incorporates CD and structural breaks, but inefficient in short-term. In addition, finance stock efficiency may change during times of extreme sentiment as finance stock prices reflect the effect of tension threshold.

## **ABSTRAK**

### **SATU KAJIAN MULTIDIMENSI KECEKAPAN BENTUK-LEMAH UNTUK SAHAM-SAHAM KEWANGAN DI MALAYSIA**

Sektor kewangan memainkan peranan penting dalam sistem kewangan. Namun, ia terdedah kepada risiko kegagalan sistematik, larian bank dan kejutan yang berpunca daripada sistem kewangan. Tujuan utama tesis ini adalah untuk menentukan kecekapan bentuk-lemah bagi saham-saham kewangan di Malaysia, yang meliputi syarikat pemegangan kewangan, bank perdagangan, bank pelaburan, syarikat insurans, pengantara pasaran modal, dan syarikat kewangan. Objektif-objektif khusus kajian ini adalah: untuk menguji ciri-ciri perjalanan rawak untuk harga saham kewangan di Malaysia berdasarkan model perjalanan rawak yang menggabungkan kebergantungan keratan rentas (CD) dan perubahan struktur; untuk memeriksa ketaklinearan dan kesan ambang harga saham kewangan di Malaysia melalui satu pendekatan autoregresif ambang dua-rejim (TAR), yang membolehkan penilaian ciri-ciri perjalanan rawak dalam rejim berasingan; untuk menyiasat kewujudan anomali kalendar dalam pasaran saham kewangan di Malaysia dengan memberi tumpuan kepada kesan "day-of-the-week", kesan "month-of-the-year", kesan "turn-of-the-month" (TOM), dan kesan percutian; dan untuk menyiasat kehadiran kesan momentum dan pembalikan pulangan jangka pendek dalam pasaran saham kewangan di Malaysia. Kajian ini menunjukkan penemuan-penemuan yang berikut: 1) Harga kesemua saham kewangan mengikuti proses perjalanan rawak, dengan itu kecekapan bentuk-lemah disahkan; 2) Terdapat CD yang kuat di kalangan unit-unit keratan rentas firma kewangan di Malaysia; 3) Setiap siri harga saham kewangan memaparkan beberapa perubahan struktur di sepanjang tempoh kajian; 4) Harga kesemua saham kewangan adalah tak linear dan menunjukkan kesan ambang, dengan itu mencerminkan pengaruh asas psikologi manusia yang menyebabkan ambang ketegangan dan perubahan tingkah laku kecekapan di rejim yang berbeza dalam harga saham kewangan. Saham-saham kewangan adalah sama ada mematuhi sepenuhnya atau sebahagian ciri-ciri perjalanan rawak dan kecekapan bentuk-lemah; 5) Kalendar anomali berlaku dalam pasaran saham kewangan; 6) Kesan momentum dan pulangan pembalikan jangka pendek wujud dalam pasaran saham kewangan, di mana ianya tidak dapat dijelaskan dalam paradigma pasaran yang cekap; 7) Disebabkan anomali kalendar, kesan momentum dan pulangan pembalikan jangka pendek adalah jelas, kecekapan bentuk-lemah dalam jangka pendek adalah tidak sah. Penemuan-penemuan di atas menunjukkan bahawa saham-saham kewangan terpilih di Malaysia adalah cekap secara bentuk-lemah berdasarkan model perjalanan rawak yang menggabungkan CD dan perubahan struktur, tetapi tidak cekap dalam jangka pendek. Di samping itu, kecekapan saham kewangan boleh berubah ketika berlaku sentimen melampau kerana harga saham kewangan mencerminkan kesan ambang ketegangan.



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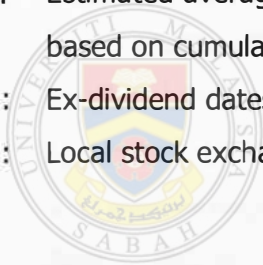
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## LIST OF ABBREVIATIONS

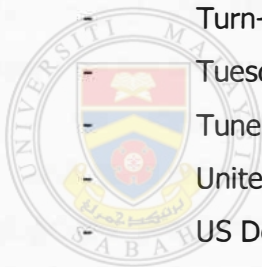
<b>ADF</b>	-	Augmented Dickey Fuller
<b>AEON</b>	-	AEON Credit Service (M) Berhad
<b>AFFIN</b>	-	Affin Holdings Berhad
<b>AFGX</b>	-	Affarsvarldens General Index
<b>AFG</b>	-	Alliance Financial Group Bhd
<b>AIC</b>	-	Akaike Information Criterion
<b>ALLIANZ</b>	-	Allianz Malaysia Bhd
<b>AMEX</b>	-	American Stock Exchange Composite
<b>AMH</b>	-	Adaptive Market Hypothesis
<b>AMMB</b>	-	AMMB Holdings Berhad
<b>ANZAC</b>	-	Australian and New Zealand Army Corps
<b>APEX</b>	-	Apex Equity Holdings Berhad
<b>APR</b>	-	April
<b>ASEAN</b>	-	Association of Southeast Asian Nations
<b>ASX</b>	-	Australian Securities Exchange
<b>AUGUST</b>	-	August
<b>BAFIA</b>	-	Banking and Financial Institutions Act
<b>BDS</b>	-	Brock, Dechert and Scheinkman
<b>BIMB</b>	-	BIMB Holdings Bhd
<b>BURSA</b>	-	Bursa Malaysia Berhad
<b>CAPM</b>	-	Capital Asset Pricing Model
<b>CCR</b>	-	Cumulative Continuous Returns
<b>CIMB</b>	-	CIMB Group Holdings Berhad
<b>CLNY</b>	-	Chinese Lunar New Year
<b>CMP</b>	-	Capital Market Masterplan
<b>CRSP</b>	-	Center for Research in Security Prices
<b>CD</b>	-	Cross-sectional Dependence
<b>CSMAR</b>	-	China Stock Market & Accounting Research Database
<b>DCF</b>	-	Discount Cash Flow Model

<b>DEA</b>	-	Data Envelopment Analysis
<b>DEC</b>	-	December
<b>DFA</b>	-	Dimensional Fund Advisors
<b>DFIs</b>	-	Development Financial Institutions
<b>DJIA</b>	-	Dow Jones Industrial Average
<b>DOW</b>	-	Dow-Jones 30 Industrials Index
<b>ECM</b>	-	ECM Libra Financial Grp Bhd
<b>EGARCH</b>	-	Exponential Generalized Autoregressive Conditional Heteroskedasticity
<b>ELKDESA</b>	-	ELK-Desa Resources Berhad
<b>EMH</b>	-	Efficient Market Hypothesis
<b>EPF</b>	-	Employees' Provident Fund
<b>EU</b>	-	European Union
<b>FBM KLCI</b>	-	Financial Times Stock Exchange Bursa Malaysia Kuala Lumpur Composite Index
<b>FBMMES</b>	-	FTSE Bursa Malaysia MESDAQ Index
<b>FEB</b>	-	February
<b>FRI</b>	-	Friday
<b>FSMP</b>	-	Financial Sector Masterplan
<b>HLFG</b>	-	Hong Leong Financial Group Bhd
<b>IFC-EMDB</b>	-	International Finance Corporation Emerging Market Database
<b>GARCH</b>	-	Generalized Autoregressive Conditional Heteroskedasticity
<b>GARCH-M</b>	-	Generalized Autoregressive Conditional Heteroskedasticity-in-Mean
<b>GDP</b>	-	Gross Domestic Product
<b>GST</b>	-	Government Service Tax
<b>G7</b>	-	Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States
<b>HLBANK</b>	-	Hong Leong Bank Berhad
<b>HLCAP</b>	-	Hong Leong Capital Berhad

<b>HOSE</b>	-	Ho Chi Minh Stock Exchange
<b>HWANG</b>	-	Hwang Capital (Malaysia) Berhad
<b>ICB</b>	-	Industrial Classification Benchmark
<b>IMF</b>	-	International Monetary Fund
<b>INSAS</b>	-	Insas Berhad
<b>IPS</b>	-	Im, Pesaran and Shin
<b>JAN</b>	-	January
<b>JOHAN</b>	-	Johan Holdings Berhad
<b>KAF</b>	-	Kaf-Seagroatt & Campbell Bhd
<b>KENANGA</b>	-	K & N Kenanga Holdings Berhad
<b>KLSE</b>	-	Kuala Lumpur Stock Exchange
<b>KPSS</b>	-	Kwiatkowski, Phillips, Schmidt and Shin
<b>KSS</b>	-	Kapetanios, Shin and Snell
<b>LLC</b>	-	Levin, Lin and Chu
<b>LM</b>	-	Lagrange Multiplier
<b>LPI</b>	-	LPI Capital Bhd
<b>LSPD</b>	-	London Business School Share Price Database
<b>JUN</b>	-	June
<b>JUL</b>	-	July
<b>MAA</b>	-	MAA Group Berhad
<b>MANULFE</b>	-	Manulife Holdings Berhad
<b>MAR</b>	-	March
<b>MAYBANK</b>	-	Malayan Banking Berhad
<b>MAS</b>	-	Malaysia Airlines
<b>MBSB</b>	-	Malaysia Building Society Berhad
<b>MDH</b>	-	Martingale Difference Hypothesis
<b>MNRB</b>	-	MNRB Holdings Berhad
<b>MON</b>	-	Monday
<b>MPHBCAP</b>	-	MPHB Capital Berhad
<b>MSCI</b>	-	Morgan Stanley Capital International
<b>MVR</b>	-	Multiple Variance Ratio

<b>NASDAQ</b>	-	National Association of Securities Dealers Automated Quotations
<b>NBER</b>	-	National Bureau of Economic Research
<b>NBFIs</b>	-	Non-bank Financial Institutions
<b>NOV</b>	-	November
<b>NPL</b>	-	Non-performing Loan
<b>NYSE</b>	-	New York Stock Exchange
<b>NYSE-AMEX</b>	-	NYSE Amex Composite Index
<b>OCT</b>	-	October
<b>OLS</b>	-	Ordinary Least Squares
<b>OSK</b>	-	OSK Holdings Berhad
<b>PBBANK</b>	-	Public Bank Berhad
<b>PESTAR</b>	-	Panel Exponential Smooth Transition Autoregressive Process
<b>P/BV</b>	-	Price-to-book Value
<b>P/CF</b>	-	Price-to-cash Flow
<b>P/S</b>	-	Price-sales
<b>PP</b>	-	Phillips-Perron
<b>P &amp; O</b>	-	Pacific & Orient Berhad
<b>Pre_CHRIS</b>	-	Pre-Christmas
<b>Pre_CLNY</b>	-	Pre-CLNY
<b>Pre_NY</b>	-	Pre-New Year
<b>Pre_RAYA</b>	-	Pre-Raya
<b>Post_CHRIS</b>	-	Post-Christmas
<b>Post_CLNY</b>	-	Post-CLNY
<b>Post_NY</b>	-	Post-New Year
<b>Post_RAYA</b>	-	Post-Raya
<b>RCECAP</b>	-	RCE Capital Bhd
<b>REITs</b>	-	Real Estate Investment Trusts
<b>RHBCAP</b>	-	RHB Capital Bhd
<b>RI</b>	-	Residual Income Valuation Model
<b>RM</b>	-	Ringgit Malaysia

<b>ROA</b>	-	Return on Assets
<b>ROE</b>	-	Return on Equity
<b>SIC</b>	-	Schwarz Information Criterion
<b>S &amp; P</b>	-	Standard & Poor's
<b>SEPT</b>	-	September
<b>SES</b>	-	Stock Exchange of Singapore
<b>SSEC</b>	-	Shanghai Stock Exchange Composite
<b>SSR</b>	-	Sum of Squared Residuals
<b>TA</b>	-	TA Enterprise Berhad
<b>TAKAFUL</b>	-	Syarikat Takaful Malaysia Berhad
<b>TAR</b>	-	Threshold Autoregressive
<b>TGARCH</b>	-	Threshold Generalized Autoregressive Conditional Heteroskedasticity
<b>THU</b>	-	Thursday
<b>TOM</b>	-	Turn-of-the-month
<b>TUE</b>	-	Tuesday
<b>TUNEINS</b>	-	Tuneins holdings Berhad
<b>U.S.</b>	-	United States
<b>USD</b>	-	US Dollar
<b>WED</b>	-	Wednesday
<b>WS</b>	-	Weighted Symmetric



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# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

The term “efficiency” denotes broad definitions in economics and finance. It could mean allocation efficiency, informational efficiency, operational efficiency, or technical efficiency.<sup>1</sup> This thesis only concentrates on the domain of informational efficiency and other types of efficiency are beyond the scope of the study. As stated by Howell and Bain (2005: 540), informational efficiency means security prices are based on the best information available. Such efficiency is interpreted by Zou (2011) as the effectiveness of market information. According to Latham (1986), the most general implicit definition of this term is security prices will not change if all private information is publicized. Hereinafter, the discussion will be centred on stock price informational efficiency.

In accordance with the meaning of informational efficiency, efficient market as it is generally understood and practiced is a market where investors are unable to earn consistent excess profits from trading securities. A priori assumption of efficient market as articulated by Fama (1965b) is that, the market should contain sufficiently large numbers of rational participants and provide almost free access to all relevant information. The competition among participants in the market will cause stock prices to immediately incorporate all available information. Concisely, as stated by Fama (1970), efficient market is a market where available information

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<sup>1</sup> Allocation efficiency means the resources being allocated were going to their most productive use. Operation efficiency indicates trading is carried out quickly, reliably, and at minimum cost (Howells and Bain, 2005: 540). Technical efficiency reflects firm’s success in producing maximum output from a given set of inputs (Farrell, 1957).