

学校编码：10384 分类号\_\_\_\_\_密级\_\_\_\_\_

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硕 士 学 位 论 文

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Dynamic Co-movement and Integration of Stock Markets

Between Hong Kong and Its Top Trading Partners

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专业名称： Financial Engineering: 金融工程

论文提交日期： 2 0 1 3 年 0 4 月

论文答辩日期： 2 0 1 3 年 0 5 月

学位授予日期： 2 0 1 3 年 月

答辩委员会主席：

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2013年04月

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## 摘要

本文主要研究动态运动建模和香港股市及其主要贸易伙伴之间的相互依存性（中国大陆地区，德国，印度，日本，韩国，新加坡，台湾和美国）。采用月度数据股票的市场价格从1992年12月至2013年1月。总共分为四个阶段：亚洲金融危机前夕，亚洲金融危机期间，介于亚洲金融危机期间之后和全球金融危机之前，全球金融危机。实施的研究方法包括Johansen协整检验，Granger因果关系测试和随时间变化的系数回归分析。该方法分为两部分，第一部分是股票的市场价格，而第二部分是股票的市场回报。

在第一部分中，我们将探讨香港股票的市场价格和其主要贸易伙伴之间的联系和相互依存。在亚洲金融危机之前，香港及其他股市之间的相关性的程度之间的变化呈现了负，低，中，高。危机发生后的相关程度增加，它会变得非常高，即使处于全球金融危机。调查结果显示，香港在亚洲金融危机前与中国和美国股市合作。然而，在全此外，球金融危机前的香港唯一与美国股市合作。另一方面，香港在亚洲金融危机期间，与七个股市协整。此外，香港也在全球金融危机期间共同集成了7个股市。实证结果表明，。误差修正模型的实证研究的结果表明，香港股市和股市，是集成的，尤其是在金融危机期间的一个重要的长期的均衡关系。

在第二部分中，我们分析香港股票收益率和回报，其最大的贸易伙伴之间的动态合作运动。结果表明，返回的合计期间是非常接近0%，根据研究的所有市场。此外，在危机期间的回报为负或接近零的倾向，如果没有出现危机的回报是正面的。一般无股市的可以发挥主导作用，影响整个香港股市。此外，其他股市，香港股市并没有显著的解释力，这个结论是正确的分时段，实施的随时间变化的回归在探索的共同变动的股市回报。实证结果显示，德国，新加坡和美国股市的回报具有较高影响，香港股票市场报酬的。当其他股票市场回流香港股票市场报酬的影响较少。然而，如果任何股市对香港的影响具有很高的回报，这将会随时间减少如果造成的影响是较低，在香港，回报这种影响会增加。这意味着，股市回报和香港股票市场回报之间有收敛。

关键词：股票的市场价格协整；因果关系；随时间变化的回归

## Abstract

This paper investigates the dynamic co-movement and interdependency between Hong Kong stock markets and its top trading partners (Main land China, Germany, India, Japan, Korea, Singapore, Taiwan and USA). Monthly data on stock market price from December 1992 through January 2013 are employed. The aggregate period is divided into four sub-periods; before the Asian financial crisis, during Asian financial crisis, After the Asian financial crisis but before the global financial crisis and the last period is during the global financial crisis. The research methodology implemented includes Johansen Co-integration test, Granger Causality tests and time-varying coefficient regressions. The methodology divided into two parts; first part related to stock market price while the second one related to stock market return.

In the first part, we examine the linkage and interdependency among Hong Kong stock market price and its top trading partners. Before the Asian financial crisis, the degree of correlation between Hong Kong and the other stock markets varies between negative, low, moderate and high. After the crisis the degree of correlation increased and it becomes very high even during the global financial crisis. The findings show that before the Asian financial crisis Hong Kong is co-integrated only with China and USA stock markets. However, before the global financial crisis Hong Kong is co-integrated only with USA stock market. In the other hand, during the Asian financial crisis Hong Kong is co-integrated with seven stock markets. Moreover, during the global financial crisis Hong Kong is co-integrated also with seven stock markets.. The result of Error Correction Model shows that there is a significant long-run equilibrium relationship between Hong Kong stock market and the stock markets that co-integrated with it, especially during the crisis.

In the second part, we analyze the dynamic co-movement and causality between Hong Kong stock return and the return of its top trading partners. The results show that the return of the aggregate period is very close to 0% for all markets under the study. Furthermore, during the crisis the returns tends to be negative or close to zero, but if there is no crisis the return is positive. The empirical results indicate that in general no stock market return can play a dominant role in influencing Hong Kong stock market return. Furthermore, Hong Kong stock market return has no significant explanatory power on other stock markets return, but Hong Kong stock market return to some extent can influence India and Korea

stock markets return. The time-varying regression is implemented to explore the co-movement of the stock markets return over the time. The empirical results indicate that Germany, Singapore and USA stock markets return have a high impact on Hong Kong stock market return. While the other stock markets return have less impact on Hong Kong stock market return. However, if any stock market has high impact on Hong Kong return this impact will decrease over the time and if the impact is low on Hong Kong return this impact will increase. That means there is convergence between stock markets return and Hong Kong stock market return.

Key words: stock market price; co-integration; causality; time-varying regression

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厦门大学博硕士学位论文摘要库

# Chapter 1 Introduction

## 1.1. Motivation

Due to globalization, deregulation, advances in information technology, economics integration and other factors all those contributed to have more integration between stock markets. Nowadays we live in a dynamic economic environment and we can see that the linkage and interdependency among the world stock markets have been increased. Investors, policymakers and portfolio managers are concern about the financial linkage and interdependency between stock markets, so it is important to have knowledge about the international stock market structure, progress and development. Also it is essential to know the direction and degree of co-movements among world stock markets. Moreover, many financial theories suggest that the integration between regional stock markets will be more efficient than the individual stock market.

As we said earlier the integration between different stock markets will affect the decision of Investors, policymakers and portfolio managers. From the point of view of investors, the decision to invest in different stock markets will depends on the degree of correlation between these stock markets. Also having knowledge about stock markets linkage will help investors to decide whether to sell or buy stocks. Policy makers should know the progress and development of stock markets integration, because that will help them to maintain the stability of the financial and economic system. In another words, policy makers should understand the nature and issues involved in stock markets integration so they can prevent or mange the harmful effects and negative shocks for transmission to their country. Portfolio managers want to design a well-diversified portfolio and this requires a proper understanding of stock markets linkage and correlation. Any changes in co-movement between stock markets needs for an adjustment of portfolios. In the other hand, portfolio managers need to know the degree of stock markets integration because if there is a high degree of integration and correlation there is no benefit from diversification. In this case portfolio managers should change their portfolio management strategies, for example they can invest in commodity and real state.

It is important to study the stock markets integration and linkage because it has many implications for assets pricing, market liquidity, market efficiency, investment decision and portfolio strategies.

## 1.2. Overview of Stock Market in Hong Kong

Hong Kong formal Security Trading activities has a long and rich history that can be traced back to nearly the end of 19<sup>th</sup> century, specifically in 1891. That year witnessed the establishment of the Association of Stockbrokers in Hong Kong. It was renamed later in 1914 as “The Hong Kong Stock Exchange”. In 1921, another stock exchange was found which was entitled as “The Hong Kong stockbrokers Association”. This stock exchange was unified with “The Hong Kong Stock Exchange” and they form “The Hong Kong Stock Exchange Ltd” in 1947.

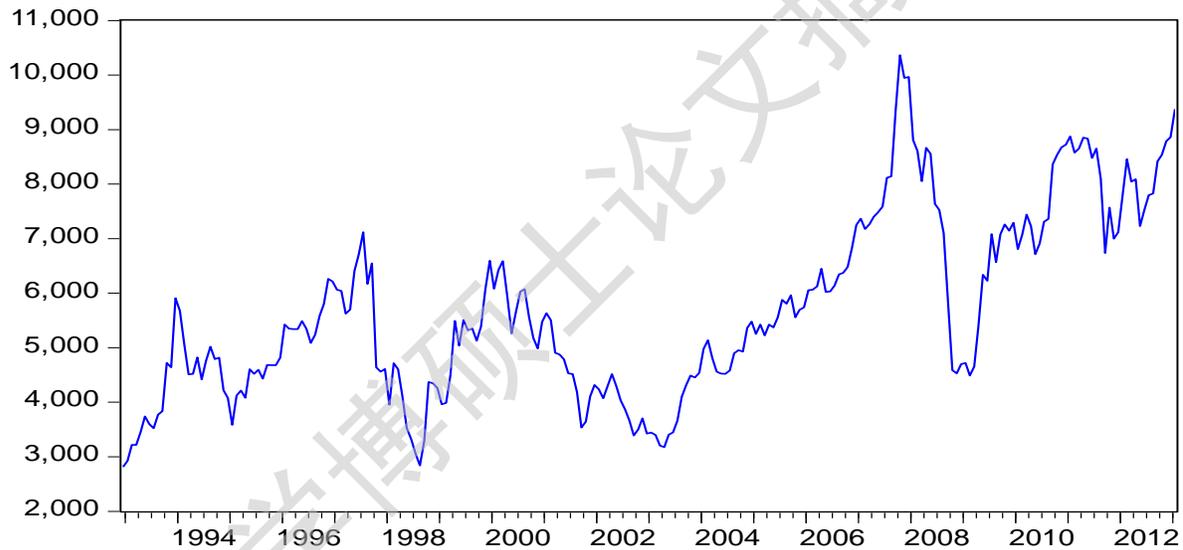
Moreover, in 1969, a second stock exchange was built up” The Far East Stock Exchange”. That was followed by another two stock exchanges, that were established subsequently in 1971 and 1972, namely “Kam Ngan Stock Exchange” and “Kowloon Stock Exchange”, respectively. By 1986, these four stock exchanges were merged and produce the current stock exchange known as “Stock Exchange of Hong Kong”, or shortly (SEHK). This merged was the beginning of a new era of security trading in Hong Kong. Yet, SEHK has gone through a series of reforms, especially after the market crash in 1987. The reforms include the establishment of executive management team and a stronger council in order to protect the public interest as well as further develop the market.

By the end of 2009, there were around 1145 companies listed in SEHK compared with 658 companies listed in 1998. Hong Kong is the sixth stock market in the world. Hong Kong’s market capitalization was US\$ 2.97 trillion in 2009 compared with US\$ 343,000 in 1998. It has become the third in the Global Financial Centres Index, right behind London and New York.

In 1997, British returned Hong Kong to Mainland China. Consequently, the Securities and Futures Commission (SFC) is now supervising SEHK. SFC chairman is chosen by the highest authority in Hong Kong” The Hong Kong Administrative Region”. Among its responsibilities, SFC has to keeps an eye on all operations that take place in the securities clearing house, the Hong Kong Futures Exchange, as well as all financial intermediaries other than members of exchange. Along with that, SFC must write two

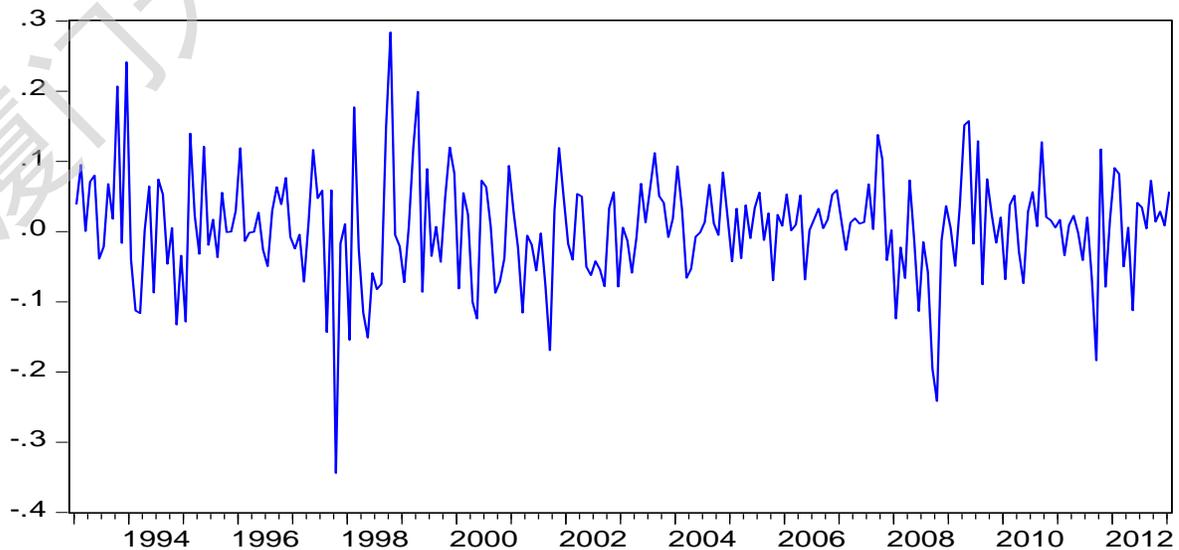
different reports, one to the Financial Secretary in Mainland China and another to the Financial Secretary and Legislative council which is required to be sent annually.

The trade value between Chinese mainland and Hong Kong reached 25.31 billion U.S. dollars in January and February, up 24.6 percent from last year, according to the latest statistics released by the Ministry of Commerce (MOFCOM). In the first two months of this year, the Chinese mainland reaped nearly 23.8 billion U.S. dollars from its trade with Hong Kong, up 22.9 percent from the previous year, while the latter reaped approximately 1.5 billion U.S. dollars from its trade with the Chinese Mainland.



Source: [www.MSCI.com](http://www.MSCI.com)

**Figure 1: Hong Kong Stock Market Index**



**Figure 2: Hong Kong Stock Market return**

Hong Kong has experienced a fascinating growth in its stock index since it was established (see Figure (1)). The graph here shows that it has been increasing in the whole sample period (from 1993 until now). Yet, that growth that Hong Kong's stock market was enjoying was not stable; rather it was influenced during the 1990s and 2000s especially as it faced two financial crises (Asian Financial Crises and World Financial Crises).

The maximum was the end of 2007 before the crises blew up. On the other hand, the minimum was during the crises in August 1998. In spite of the fact that Hong Kong stock market was affected by the current crises, it is clear that it is recovering now. However, figure (2) shows that the average returns of Hong Kong stock market almost equal to zero. Moreover, the fluctuation is higher during the crisis which indicates that there is more risk during the crisis.

### **1.3. Importance of the study**

In recent years, the financial integration and linkage among world stock markets have been increased. This increased has grasped the attention of many parties such as, Investors, portfolio managers and policy-makers. From the point of view of investors, they want to know the correlation between stock markets and if there is any market play dominant role to influence the other markets. In the other hand, portfolio managers want to design a well-diversified portfolio and this requires understanding the interdependency and co-movement among stock markets. Policy-makers want to prevent negative shocks and financial crisis transfer to their countries. Also, they want to maintain the financial and economic stability. This paper aim to provide the different parties information related to co-integration, causality and the dynamic co-movement between Hong Kong stock market and its top trading partners. Many empirical studies have investigated in general the stock markets co-integration and stock markets co-movement. This paper is the first paper focus on the co-integration and co-movement between Hong Kong stock market and its top trading partners.

### **1.4. Objectives**

The main objective of this paper is to investigate the co-integration and the dynamic co-movement between Hong Kong stock market and its top trading partners. As mentioned earlier in the motivation and literature review, having knowledge about the degree of correlation, co-integration, causality and the dynamic co-movements between stock markets will be useful to Investors, portfolio managers and policy-makers. Using prices of stock markets indices of countries under study, this paper implemented different tests and models such as, unit root test, Johansen co-integration test, Granger causality test, error correction model and time-varying regression.

In general, the paper tries to provide answers to the following three questions:

- 1) Is Hong Kong stock market co-integrated with its top trading partner's stock markets?
- 2) Which stock market return influence Hong Kong stock market return and which stock market return influenced by Hong Kong stock market return?
- 3) Who Hong Kong stock market return dynamically co-moved with other stock markets?

## **1.5. Structure of the Paper**

The paper is presented as follows:

### **Chapter 1: Introduction**

This chapter contains the motivation, the importance and the objectives of the study. After that there is an overview of Hong Kong stock market.

### **Chapter 2: Literature Review**

After chapter one, chapter two present some previous literature review.

### **Chapter 3: Data and Methodology**

The chapter outlines the data and methodology used in the study. The chapter gives brief summary about selection of the data and the criteria of dividing the aggregate period into four sub-periods. After that there is description of the methodology. The methodology includes, correlation, unit root test, Johansen Co-integration test, Granger Causality tests and time-varying coefficient regressions

### **Chapter 4: Empirical Results**

The empirical results of the study are presented in this chapter. Some results such as co-integration, error correction model are related to stock market price. The other results such as causality and time-varying regression are related to stock market return

### **Chapter 5: Conclusion**

Chapter five present the main findings and conclusions of the study. The last part of the chapter includes some ideas for further research.

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