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How close a relationship does a capital market have with other such markets? The case of Taiwan from the Asian financial crisis ☆

Chingnun Lee [a], Fu Shuen Shie [b,*], Chiao Yi Chang [c]

[a] Graduate Institute of Economics, National Sun Yat-sen University, No. 70, Lienhai Rd., Kaohsiung 804, Taiwan, ROC
[b] Department of Finance, National Taichung University of Science and Technology, No. 129 Sec. 3, Sanmin Road, Taichung City 404, Taiwan, ROC
[c] Department of Insurance and Finance, National Taichung University of Science and Technology, No. 129 Sec. 3, Sanmin Road, Taichung City 404, Taiwan, ROC

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ABSTRACT

In assessing how far and how close the relationships are between the Taiwan capital market and other international capital markets in Asian financial case, we examine the co-movement patterns by developing the "unequal variance test". We find that a closer relationship exists between Taiwan and Hong Kong throughout the sample period than between Taiwan and other Asian countries and the US. It thus appears that adjacent regions with similar backgrounds in terms of their capital markets will reflect price patterns that are more similar to those of Taiwan than those of countries with which Taiwan frequently trades or cooperates.

1. Introduction

Owing to reasons attributed to close interaction in economic trade or the sudden dispersion of international information, capital markets in different countries may frequently affect each other. The past literature has provided extensive discussions and findings related to the issue of linkages among stock markets using the cointegration approach. Similar examples related to the co-movement patterns

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* Corresponding author.
E-mail addresses: lee_econ@mail.nsysu.edu.tw (C. Lee), fsshie@ntit.edu.tw (F.S. Shie), cyc@ntit.edu.tw (C.Y. Chang).

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in international capital markets abound in the literature and the reasons for these relationships have been investigated (Malliaris and Urrutia (1992); Chan et al. (1992); Arshanapalli and Doukas (1993); Arshanapalli et al. (1995); Najand (1996); Uri et al. (1996); Wang et al. (2003); Atteberry and Swanson (1997); Ng (2002); and Yang et al. (2003)). What is implied in the cointegration of international capital markets is that there exist cross-country spillover effects and transmissions of shocks.

Some of the empirical results suggest that co-movements in the international stock markets could be observed following the occurrence of a financial crisis. Two famous financial crises have often been mentioned in the past: the October 1987 global stock market crash and the July 1997 Asian financial crisis that emerged in Thailand. The two cases appear to exhibit similar spillover effects. Arshanapalli and Doukas (1993) regarded the state of the stock markets from 1980 to 1990 and the crash of October 1987 as a watershed. By taking into consideration the Dow-Jones Industrial index, Frankfurt's Faz index, the London FT-SE 100 index, Japan's Nikkei index, and Paris's CAC index, they found that there was an increased tendency for co-movement among most international markets after the crash. Arshanapalli et al. (1995) examined the cointegration effect after the crash in October 1987 in spite of no relationship being found among these markets including the US and various Asian countries (Japan, Malaysia, Singapore, Thailand, the Philippines and Hong Kong) before the crash.

Several studies have suggested that a co-movement pattern exists following the Asian financial crisis, for instance, Arshanapalli, Doukas, and Lang (1995). Ng (2002) pointed out that the linkages among the stock market returns of Indonesia, the Philippines and Thailand exhibited a long-term relationship following the Asian financial crisis in 1997 although no such evidence was found before the crisis. Yang et al. (2003) found similar evidence regarding the transmission mechanism in the 1997 Asian financial crisis among stock markets that included those of the United States, Japan, and Asian emerging countries, showing that country-by-country stock market integration tends to change the leader–follower relationships around the time of the financial crisis period.

Although these past studies have yielded common results with regard to the cointegration effects, the evidence regarding the relationships is still somewhat contradictory. Chan, Gup, and Pan (1992) analyzed the degree of integration among securities markets in Hong Kong, South Korea, Singapore, Taiwan, Japan, and the United States and found no close relationships among any of these markets.

Some natural questions that arise are as follows. First, "how close" are the relationships between the stock markets? Although past studies point out whether or not the interconnections may exist by applying cointegration models, little is known about the how close the co-movement relationship is at present. Second, what is the main reason the spillover effect exists in the first place? Is it because of the adjacent region and the similarities of background of the capital markets, or the international trade and the business cooperation that take place among countries? While the closeness of the relationship could be observed, the answers to the factors behind the spillover effects are much clearer. Third, have the relationships changed because of the financial crisis? It is reasonable to consider that the cointegration relationships will change over time.

Regarding the first question, as to "how close" the relationship is between capital markets has become an interesting and important challenge to traditional thinking that is based on forming an international portfolio for investors. In assessing how far and close the relationships are between international capital markets, we examine the co-movement patterns by developing the "unequal variance test". This paper builds a statistical test referred to as "the unequal variance test" which, as will be seen later, seeks to find which are the closest linkages.

As for the second issue which relates to why spillover effects exist, we specifically focus on the linkages between each pair of stock markets and include Taiwan in each pair, such as East Asia and Taiwan, and the US and Taiwan. The country of most interest to us in this paper is Taiwan. The other countries related to Taiwan include Australia, Hong Kong, Malaysia, the Philippines, Singapore, South Korea, Thailand, and the US. The main reason why we choose Taiwan is that much trade has taken place with Taiwan with countries other than those in the Asian region over the past several decades, for instance with the US. If the crisis, for example, emerges in Asia, the influence of the spillover effect will be slight for the US and, consequently, for Taiwan. Therefore, this paper attempts to use Taiwan as its central focus to examine the long-run relationships among stock markets including the US market and other Asian markets. The links in terms of stock price movements are closer between the Taiwan and US markets owing to their great trading activities, or between Taiwan and other Asian markets owing to their similar backgrounds.