

CHAPTER 2

LITERATURE REVIEW

One of the earliest studies on stock market interactions in the Asian region is conducted by Cheung and Mak (1992). By using weekly stock indices from January 1977 to June 1988, they examined the Granger causality relationships between the Asian-Pacific emerging markets (Australia, Hong Kong, Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand) and the two developed markets of U.S. (as a global factor) and of Japan (as a regional factor). Their results show that, in this time frame, the US market leads most of the Asian-Pacific markets, except that of Korea, Taiwan and Thailand, and that the Japanese market plays a less important leading role in the region. However, a later research by Masih and Masih (1999) to examine the link between stock market fluctuations and intra-regional contagion effects shows a slightly different result. In their study, they utilised the daily closing stock price indices from four Asian emerging stock markets of Malaysia, Singapore, Hong Kong and Thailand in a different time period ranging from 14 February 1992 to 19 June 1997. They concluded that the stock market fluctuations in all these Asian markets under study are explained mostly by their regional markets and not so by the more advanced markets of U.S., Japan, U.K. and Germany.

By using the Engle-Granger two-step procedure, Palac-McMiken (1997) studied whether the ASEAN-5 stock markets are collectively efficient. The period of

study is from 1987 to 1997. Monthly price indices were used, and similar to the other studies conducted by the above-mentioned researchers, he did not include any major financial crises in his study, be it the global stock market crash of the late 1987 or the mid-1997 Asian financial crisis. Arguably, a set of stock markets is said to be collectively efficient in the long run if their stock prices are not co-integrated (i.e. have no long-run relationship). His results revealed that, with the exception of Indonesia, all the other four ASEAN stock markets are linked with each other, and therefore are not collectively efficient in the sample period. However he suggests that, although the ASEAN-5 equity markets are interdependent, there is still scope for efficient portfolio diversification across the markets in the short-run.

Mansor (2000) replicated a very similar study to that of Palac-McMiken (1997), except that he started his sample period a year earlier and all the stock returns are adjusted for exchange rate fluctuations by denominating in Malaysian currency. His primary objective is also to analyze the degree of financial integration but with particular reference to the benefits of portfolio diversification among these ASEAN-5 equity markets from Malaysian perspective. His results are quite similar to Palac-McMiken's (1997) in that all these five markets are highly integrated in long run.

Undoubtedly, the 1997 Asian financial crisis has affected the financial systems and the real economies of many Asian countries, whether directly or indirectly. Until today the effects from this infamous Asian meltdown are still lingering in some of these countries. With such an enormous impact, this crisis expectedly

becomes an important focal point in most of the more recent studies on market interdependence. With the ultimate aim of examining the pattern of transmission channel during the Asian financial crisis, Yang and Lim (2002) tested the extent of contagion effects among nine East Asian equity markets, comprising Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand and Taiwan. The daily stock returns of these nine markets from January 1990 to October 2000 are divided into two sub-periods: Pre-crisis and post-crisis. They pointed out that there is no evidence of long-term co-movements among these East Asian markets, but only short-term correlations, in both the sub-periods. Moreover, their study finds a substantial increase in degree of interdependence, and this, according to them, reflects the presence of contagion effects in the region.

A similar research on the impact of the Asian crisis on the regional bourses was conducted by Jang and Sul (2002). By using the daily stock indices, they examined the changes in the co-movement among the stock markets of the countries that were directly affected by the Asian financial crisis in July 1997 (i.e. Thailand, Indonesia and Korea) and some of the neighbouring Asian countries (i.e. Japan, Hong Kong, Singapore and Taiwan). Their study shows that prior to the crisis, a significant co-integration is found only among Korea, Japan and Singapore and none in other cases. However, during the crisis period and thereafter, there is an obvious significant increase of co-integration cases. Similarly, they found no significant Granger causality cases before the crisis, but a marked increase during and after the crisis. Particularly, in the post-crisis

period, Granger causality from Japan to other Asian countries is found to be rampant.

Moon (2001) investigated the impact of the 1997 Asian crisis on stock market integration in East Asia, and then compared this experience with Europe's experience after the ERM crisis (1992-93). This study finds that in the long and short run, East Asian stock markets have become increasingly integrated with the US market after the crisis, confirming the popular view that the Asian crisis brought about US dominance over Asian stock markets. In the case of Europe, there appears to be a temporary increase in stock market linkages only during the crisis period and the relation of European markets with US market remains very limited throughout the ERM crisis. Moon accounts for these contrasting behaviours of Asian and European stock markets by referring to their different experiences regarding capital liberalization, particularly foreign equity investment liberalization.

Cheung, et al. (2002) applied the cointegration techniques to the daily equity returns in order to examine the interactions between the U.S. and the four East Asian markets of Hong Kong, Singapore, Taiwan and Korea. They sub-divided the sample period used into three periods, which are, before (from January 1995 to June 1997), during (from July 1997 to June 2000) and after (from July 2000 to July 2002) the Asian financial crisis. As in the results obtained by Moon (2001), the empirical evidence confirms the dominant role of the US market in all the three sub-periods. The US market leads these East Asian markets before, during and after the crisis. However, a rather interesting outcome is obtained: the US

market is evidently Granger-caused by the four Asian markets during the crisis period. Given Japan's dominance in terms of trade and finance in the region, there were concerns with regard to the impact of the Japanese currency movement on these markets. With this in mind, the researchers included the Japanese yen effect in their study. The results show that changes in the yen currency does affect the equity markets before and during the crisis but not in the post-crisis period.

Are the four Dragons' equity markets (China, Taiwan, Singapore and Hong Kong) interdependent? This issue was investigated by Roca (2002), where he applied the Johansen-Juselius (1990) cointegration methodology to the daily stock price data, expressed in U.S. dollars, to analyze the long-run interactions between these markets. To examine the short-term linkages, he utilized both the generalized forecast variance decomposition (GVDC) and the impulse response function (IRF) analyses (Pesaran and Shin, 1998). He based his study on two sub-periods – before (from 1 January 1993 to 1 July 1997) and after (from 1 January 1998 to 10 September 2001) the Asian crisis. The half-a-year gap between these sub-periods is considered as the crisis period, which he had deliberately omitted. His findings reveal the absence of a long-term linkage in both sub-periods but there is a significant short-term interdependence among some of the markets. The GVDC and IRF analyses show that each Chinese market reacts to a shock from another market immediately within the first trading day and this reaction is mostly completed within two days. Hong Kong is found to be the most, while Taiwan is the least, influential among the four markets. After

the crisis, there is an increase in the degree of interdependence among the four markets.

Another study uses sub-periods not according to the occurrence of the Asian crisis, but instead to the period when quite a number of countries started relaxing their foreign exchange restrictions. By estimating a multivariate co-integration model in both the autoregressive and moving average forms, Phylaktis and Ravazzolo (2002) examined the effect of stock market liberalization on financial linkages among seven Asian capital markets (Japan, Hong Kong, South Korea, Malaysia, Singapore, Taiwan and Thailand) and the U.S. In other words, they investigated whether these financial linkages were affected by the relaxation of foreign exchange restrictions. The two sub-periods defined in their study are: the pre-liberalization period, which covers from January 1980 to December 1989, and the post-liberalisation period from January 1990 to December 1998. They explained that the autoregressive form allows examination of the long-run relationships of these markets, while the moving average form examines the relative importance of each market to the common trend or vice versa. They also applied the recursive analysis to the cointegration system in order to identify the evolution of linkages of these markets. The analysis was repeated by using end-of-the-month observations of the stock market index prices expressed in local currencies, in U.S. dollars and in real U.S. dollars. Their purpose in calculating the stock price index in U.S. dollars is to eliminate local inflation by incorporating the exchange rate fluctuations. However, it must be noted that the U.S. inflation would still remain in the stock price level. Their empirical results show that all the

stock markets are not linked together for both the 80s and the 90s periods and that U.S plays a small role while Japan's role is more significant.

An interesting and slightly modified approach is adopted by Fernandez and Sosvilla (2000) when they studied the presence of long-run relationship among Asia's five top stock markets of Japan, Taiwan, South Korea, Singapore and Hong Kong. Instead of formally specifying the sub-periods, they modeled the long-run relationships by using structural breaks. In particular, besides applying the standard cointegration techniques to the daily data for the entire length of the sample period from 1977 to 1999, they had also repeated the analysis by including dummy variables to allow for structural shifts in the long-run relationship. These shifts refer to changes experienced in these countries during this sample period, like the recent turmoil in the stock and foreign exchange markets of this region. Their results indicate that without the structural breaks, there is no evidence of long-run relationships between these stock markets. In contrast, when structural breaks are introduced, there is strong evidence of long-term equilibrium between the Taiwanese and Japanese stock indices from October 1987, and some marginal degree of cointegration between Singapore and Japan until February 1992 and between South Korea and Japan from April 1987.

A study undertaken by Darrat and Zhong (2000) also incorporates structural breaks in the error correction model. The main objective of their study is to examine whether U.S. or Japan, or both, is the permanent driving force behind each of the eleven emerging Asian-Pacific equity markets of Hong Kong, India,

Korea, Pakistan, Sri Lanka, Taiwan and ASEAN-5. The justification of their use of weekly data from November 1987 to May 1999 is the necessity to avoid problems of daily data that arise from non-trading, non-synchronous trading and the bid/ask spread. To achieve the objective of their study, they used the two procedures proposed by Johansen (1991) and Gonzalo and Granger (1995) to decompose trivariate cointegrating systems, comprising the U.S., Japan and each of the Asian-Pacific markets, into their permanent and transitory components. Their results show a strong cointegration relation between each of the emerging markets with the two matured markets of the U.S. and Japan. In addition, the study also shows that the U.S., rather than Japan, is the main permanent driving force in the equilibrium relationships across all these markets. Japan only plays a transitory role.

Though not as extensive, there are still a considerable number of similar studies done on the Latin American equity markets. Chen, et al. (2002) chose to study six Latin American countries because they represent fast developing economies that are linked by cultural heritage and by some common business conditions. Using cointegration analysis and error correction vector autoregressive techniques, they found that the stock indices of Argentina, Brazil, Chile, Colombia, Mexico and Venezuela share one common long-term equilibrium relationship for the whole period of study from February 1995 to June 2000. For the same reason mentioned earlier, they repeated their analysis on the end-of-day stock price indices in both local currency terms and in U.S. dollars. They had intentionally started their sample period from the point after the Mexican financial crisis of 1994. The reason for this exclusion is so that they could discount the

dependencies due to this 'Tequila' contagion which they claim could bias the results towards finding linkages. Besides applying the cointegration tests to the whole period, they also repeated their analysis according to three sub-sample periods. Again, they avoided the Asian and Russian crises with the ultimate purpose of analyzing the dependencies under 'normal' market conditions. The sub-sample periods are February 1995 to September 1997 (prior to the Asian financial crisis, Hong Kong version), November 1997 (post to the Asian crisis) to August 1998 (prior to the Russian financial crisis) and from February 1999 (post to the Russian and Brazilian crises) to June 2000. They found evidence of existence of long-run relationship in the first and second sub-sample periods, but none in the last period.

In concluding this section, it is worthwhile to note that we cannot make any direct comparison of results unless these studies involve exactly the same set of variables and factors. Generally, the choice of markets, the sample periods chosen, the frequency of observations (daily, weekly or monthly) and the types and variation of methodologies employed are some possible factors that may influence the results obtained.