Chapter 1

Introduction

Liberalization and globalization have stimulated the development of closer financial, as well as trade, relations between countries. It seems that, in more open to the other economies, the financially arbitrage mechanism could play gradually increasing role in equating the equivalent risk assets to have the equivalent *risk adjusted expected return* in and between both developed and emerging economies[1]. The arbitrage mechanism cannot work without the ability of capital mobility between countries. The ability of capital mobility depends on many factors especially the control and regulation which are imposed by the government and regulators. Capital mobility approaches each country in the form of not only the foreign direct investment (FDI) but also the foreign portfolio investment (FPI). The capital flows, like a tide, will help equate the price of the equivalent risk assets. To reach the price equating process, the prerequisite of free access in term of legal and economic issues, for example, the transaction cost, must be reached. Consequently, such economic behavior could be obviously expected in the convergence of world integrated economies given the assumption that the country intends to participate the world financial liberalization.

Stock market is undoubtedly accepted as one of the important units in economic system. Gurley and Shaw (1955, 1960) and Goldsmith (1969) indicated that self-financed capital investment first gives way to bank-intermediated debt finance and later to the emergence of equity markets as an additional instrument for raising external funds, as economies develop. Levine (1991) and Bencivenga, Smith, and Starr (1996) showed that the stock markets may affect economic activity through the creation of liquidity. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinkquish control of their savings for long periods. Liquid stock market makes less risky and more attractive because it allows savers to acquire stock and to sell it quickly and cheaply if they need access to their saving due to liquidity shock or want to alter their portfolios. In other words, the liquid stock market help reduce liquidity risk. At the same time, corporates enjoy permanent access to capital raised through stock issues. By facilitating longer-term, more profitable investments, liquidity in stock markets improve the allocation of capital and enhance prospects for long-term economic growth. Further, by making investment less risky and more profitable, stock market liquidity can also lead to more savings and investment. Investors will

---

[1] The term "emerging markets" is used to denote developing countries and transition economies. This category is consistent with those classified by the International Finance Corporation (IFC).

come if they can leave. Levine and Zervos (1996) found that the component of stock market development is positively and robustly associated with long-run economic growth. If the stock market integration could lead to stock market liquidity, it would affect the long-run economic growth.

It, also, could be argued that when the globalization is impossible to resist, the integration between countries and regions becomes a matter of consideration. The stock markets integration will undoubtedly plays an essential role in development of each stock market and consequently the economy as a whole. The integration of stock markets, part of capital markets, can lead to the higher ability in risk diversification which is benefit to both domestic and international investors. However, the benefit will not come alone. There is a number of studies that opposes the benefit of perfectly free flow of capital (implies the perfect market integration). The counter arguments are, for example, that the free movement of capital to the capital market could induce the high volatility to the market. Some asserts that the overly free mobility of capital could create the higher probability for country in running into financial crisis

By permitting trade in financial assets, such as common stock, to take place regardless of either national boundaries or the nationalities of market participants, there is a strong presumption that the efficiency, liquidity, risk-pooling and disciplinary attributes of capital markets will be enhanced. In financially integrated markets, capital should flow across borders in order to ensure that the price of risk, the compensation investors require for bearing such risk, is equalized across assets in different countries. Implications of the law of one price can be deduced for consideration of stock markets integration case. If forces, such as capital controls, differential in tax treatment, informational cost, relevant restrictions, and so on, are imposed to stock markets, then it is likely that different levels of required compensation for risk will be the case of different economies. Such different requirement will imply and reflect the market in term of the degree of stock markets integration. Thus, the main idea about stock markets integration is somewhat the relative degree which could be measured through the differential in required compensation for risk in each individual country.

1.1. Motivations and objectives of the study

The impediments to stock markets integration can be in many forms as mentioned earlier. Most countries, including those developing ones in Asia, impose some restrictions on capital mobility, and since none can claim that all of its assets are perfect substitutes for those of other countries, thus, the capital market integration is a matter of degree. Thus, the policy could be made and implemented to control the level of stock markets integration by tightening or lessening the

factors affected the impediments. Governing the degree of stock markets integration, whether directly or indirectly, depends on the expected cost benefit the individual economy will obtain. The clear understanding about the stock markets integration and the consequences of the degree is essential, thus. The question that the stock markets integration should be promoted or controlled could be considered by the cost benefit analysis.

The case against the stock markets integration rests mainly on the premise that capital flows are, or often can be, destabilizing, and that the costs associated with instability exceed whatever benefits otherwise derived from free capital mobility. Corden (1994) argued that although instability arises from capital flows that are speculative, speculative flows are not necessarily destabilizing. Indeed, speculative capital flows that force authorities to abandon and exchange rate that is inconsistent with fundamentals are stabilizing, and it is the authorities' policies which, in these circumstances, are destabilizing. In other words, stock markets integration imposes discipline on policy makers, which can be a potentially important benefit of stock markets integration. Bhagwati (1998) does not agree with all the benefit gained from the free mobility of capital flow between countries. He argued that the overly free of capital flow could cause the probability of running into a financial crisis which is clearly observed in the current economic situation. He also asserted that freeing up trade is good but freeing up capital flow is doubtful.

The conflict between benefit and cost concerning to the policy in liberalization of capital flow affecting the degree of stock market integration could be viewed in two levels; the capital market level (market microstructure) and the economy level (macro economic level). Levine and Zervos (1998) shows the linkage between micro and macro level in their study. The study summarized the positive relationship between stock market development and long-run economic growth.

The controversial issues in policy making in term of promotion or demotion of stock markets integration should be resolved or, at least, understood. This study is scoped to the effect of the stock market integration on the micro level which concerns the market microstructure. In other words, the impact of stock market integration to the quality of market is of interest in this study. This study investigates the relationships of the degree of stock markets integration against the benefit and cost to each Asian stock market using microstructure proxies. The proxy for the benefit will be the liquidity of the market and the proxy for the cost will be the volatility of return on the markets. Cohen, Conroy, and Maier (1985), Amihud, Mendelson (1987), Hasbrouck (1991, 1993) defined the market quality in term of liquidity, volatility, informational efficiency, and transaction cost. This study is designed to

explore the only first two aspects of market quality because the liquidity and volatility are widely interesting and easily understandable to most market participants.

1.2. The definition of the problem

It could be argued that if the stock markets are more integrated, the liquidity of each market should be higher. When the markets are more integrated, it implies the decreasing in transaction cost or barriers to enter the markets. Consequently, it should convince international investors to enter the markets due to higher net benefit they receive on diversification ability. The more convincing to international investors about the wider investment opportunity, the higher liquidity in the stock markets might be the case. Although the capital inflow to stock markets can help increase the market liquidity, simultaneously, it may volatilize the return of the stock market as well. The higher volatility of the return from portfolio investment is undesirable to any investor in term of risk loading they may bear. However, some has counter argued that it is untrue about the capital inflow causing the higher volatility. However, if the former argument, the capital flow to the stock market may cause the higher volatility of the return in portfolio investment, is the case, it might cause the higher expected return in the portfolio investment the investors require for bearing such higher risk. If the requirement is sufficiently big, it may crowd out the liquidity benefit.

Stock markets integration could be considered as two-sided coin. The cost-benefit analysis, in this case, needs the measure of stock markets integration together with the measure of liquidity and volatility. The empirical study on the relationship between the degree of stock markets integration and stock markets liquidity will be conducted. Also, the relationship between the degree of stock markets integration and stock markets return volatility will be studied as well.

In measuring the degree of stock markets integration, this study employs the observations from Asian countries. They are Hong Kong, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand. There are a number of reasons to select these countries as samples in my study. International trade of these countries seem to increase rapidly both among them and to the rest of the world. Also, the economic cooperation in these countries are substantial. The communication among this country has less barrier comparative to the others. Not only the transportation among them but the same time zone of these countries makes the financial transactions, including the stock trading, very easy. The different time zone, fulfilling all-day trading for western investors, is attractive for those to come into these regional markets. From the selected countries as the samples, they are composed of both developed markets; Hong Kong and Singapore; and emerging markets; Korea, Malaysia, Philippines, Taiwan, and Thailand. In term of stock market integration, there would be some

interesting difference between developed and emerging market. The interactions between countries when one implements any policy, affecting the degree of stock markets integration, will be considered. The interaction in this case can be explained as the protective measure that each country will make to counter the attack caused by the other countries' policy. In this case, such policies are limited to those which affect the degree of stock markets integration. The interactions could be made simultaneously with the others. The multivariate technique is employed instead of the simple univariate analysis to comply with the simultaneous interactions between countries. Although the univariate analysis is much easier to understand but it will be less powerful relative to the multivariate analysis, in this case.

1.3. Essence of the study

The study in the area of stock markets integration mostly pays attention to the matter of how to measure the degree of market integration. In this study, the measurement in degree of stock markets integration is still explored and applied too. However, the additional contribution of this study is not the only another dimension of the integration measurement but also the study in the relationship between the degree of stock market integration and the quality of stock market. The relationship study, here, does not mean the "causality". The intention of the study is to provide the only starting point of another angle of the study in this area concerning to the integration degree. The implication drawn from this study might help us in better understanding and guide to the appropriate policy making in term of promotion or demotion of stock market liberalization.

In this study, the market index is used for return calculation, as employed in previous studies in this area. However, most of the attempts to study the stock markets integration is on how to measure the degree of the stock markets integration. Riedel (1997) suggested that the measure of capital market integration could be at least two approaches. They are the extent to which the law of one price to hold and the changes in the magnitude of capital flow. The former approach is the conceptually purest measure for the degree of stock markets integration. However, it is difficult to apply this measure empirically because the relevant prices, i.e., the expected returns of financial assets are not directly observable. And also, to test and to apply the law of one price in stock markets requires the asset pricing model such as CAPM, APT, to price the assets. Thus, the testing of stock markets integration using those models obeys a joint hypothesis in testing about how subjective expectations of future returns are formed which makes matters very complicated indeed [Frankel (1989), Montiel (1994)].

To overcome, or at least contribute acceptable measure, the *ex post* market index of each country is not applied for being proxy of the *ex ante* parameters in the asset pricing model. The expected returns will be deduced from the information set which the *ex ante* observations conditioned on. This methodology is widely employed in testing the degree of markets integration such as De Santis and Gerard (1997), Cumby and Khanthavit (1992), etc. However, those previous works assumed that the degree of markets integration is constant over time. Cumby and Khanthavit (1992) studied the Thai market and found that the Thai market and the world market between 1977 and 1990 became more integrated over time. Bekaert and Harvey (1995) also investigated the degree of stock markets integration for those emerging markets using switching regime rather than the direct asset pricing models. They found that the degree of stock markets integration is not constant over time. By the finding of time-varying degree of market integration, I, then, allow the degree of stock markets integration to be time-varying using the conditional CAPM as base for asset pricing model.

This study pays attention to time-varying degree of stock market integration, not the constant one. There are gaps in this area which might be filled up for completion. This study is designed to work on both popular techniques in capture the degree of market integration, the difference of price in identical risk assets and the regime switching. In the identical risk assets price difference, the gap is filled by the estimation of time-varying degree of integration using maximum likelihood estimation of bivariate GARCH(1,1) for the covariance risk of conditional capital asset pricing model (CCAPM). For the regime switching, the similar work done by Bekaert and Harvey (1995) is replicated but expand the study period to more recent one which seems to change in economic environment substantially. Moreover, the focus of this study is not just how to measure the time-varying degree of stock market integration but the relationship between the degree of stock market integration and the microstructure of the stock market, the market quality is the main focus. Thus, the relationship between degree of stock market integration and the quality of stock market through the liquidity and volatility of market, as proxies is the main question to this research.

The joint hypothesis problem in testing the degree of markets integration is not the case in this study. The test of asset pricing models, such as CAPM and APT is frequently rejected by the empirical data and it is, also, frequently concluded that the rejection comes from the inconclusive joint hypothesis testing. However, the estimation of the degree of capital markets integration using such asset pricing models is to estimate the relative degree of the capital market integration rather than the true and absolute degree which require the correct and unbiased models. Levine and Zervos (1998) explained that estimation of the relatively integrated degree is to explore to see

whether the Thai stock market, for example, is more tentatively integrated to the world market than the Philippines stock market. It concerns only the relative measure not the absolute measure. Thus, the bias of models used is not necessarily considered as a crucial problem.