Chapter 2

The market integration

Levine and Zervos (1996) pointed out that the perfect capital market integration needs the free flow of capital across international borders to equate the price of risk. If there exists any capital controls or other barriers impede the movement of capital, the price of risk tends to be different internationally. Riedel (1997) explained that a country is integrated into world capital markets if

(a) capital is free to move into and out of the country and

(b) the country's assets are substitutes for those of other countries.

We can notice that the sense of the capital market integration concerns the two aspects, the controls of capital flow and the mechanism that equate the price of risk. The definition of market integration could be considered in detail as followed.

2.1. Definition of market integration

Bekaert and Harvey (1995) defined the market integration in the sense that the markets are completely integrated if assets with the same risk have identical *expected* return irrespective of the market. Risk, in this sense, can be referred to the exposure to some common worlds factor which is not necessary the same as domestic factors. On the other hand, a market is said to be segmented from the rest of the world if its covariance with a common world factor have little or no ability to explain its *expected* return. In addition to the risk aspect, the reward to risk is also important for consideration. In integrated world capital markets, there are common rewards to risk associated with risk exposures. In explaining the cross-section of expected returns, the reward to risk is not important because it is common to all the integrated countries. However, in segmented markets, the rewards to risk may not be the same because the sources of risk are different. In other words, the law of one price or arbitrage mechanism can definitely work as the behavior of stock markets integration.

It is clearly accepted that the integration or segmentation is somewhat the degree of unique price, regardless of currency denominated, for the equivalent risk asset. Thus, to measure the degree of stock markets integration could be deduced by the arbitrage argument as stated above. To show the mechanism of arbitrage in equating the price of risk, the case of two identical class of risk bearing but different class of control of asset will be considered. Hietala (1989), Bailey and Jagtiani (1994), and Kiranand (1996) showed the case of countries that have dual classes of equity, restricted and unrestricted one. There will be price differential, *ceteris paribas*. Restricted equity can

be held only by domestic residents, supposedly, but unrestricted equity can be held by both domestic and foreign investors. The prices differential between restricted and unrestricted shares that have identical payoffs is a direct measure of the effects of capital controls. More obvious examples of the law of one price can be shown by the differences between official and black market exchange rate. Official and offshore interest rates, market price and net asset value of close-end country mutual funds, and etc., could be drawn as the measures of capital controls [Bonser-Neal, et al. (1990)].

The impediments to foreign investment in domestic market such as government restrictions on capital flow, differential in tax treatment, foreign ownership restrictions, etc., could be avoid in, at least, some way. Therefore, not all the restrictions imposed by domestic government are binding to foreign investor [Penpas (1997)]. However, the avoidance from the impediments, either imposed by domestic government or else, requires a certain level of cost to pay. Thus, the way to avoid such restrictions might be worth nothing if cost to avoid is at least equal the cost of the restriction *per se*, especially in the equilibrium condition of market.

Another aspect concerning in this discussion is that the market has informational efficiency. The arbitrage mechanism can work effectively and efficiently if and only if the market is efficient internationally in term of information. A number of study in this area applies the conditional asset pricing models to estimate the degree of market integration. One of the underlying assumption in using the conditional models is that the expected returns are derived from the information perceived in the previous period. Therefore, the *ex ante* variables can be functions on the current information both locally and globally. An interesting implication on this issue can be drawn. The market is said to be segmented if it's return is comparatively more influenced by local information than global information and *vice versa*.

2.2. Measure of market integration

To measure the level of market integration is interesting to a large number of researchers. The concepts of such measuring have been developed for quite a long time. The concepts may be categorized into three main groups, the correlation between markets, the capital flow proxy, and the equilibrium price of identical risk of assets.

The correlation analysis

The basic idea in measuring the level of market integration arises from the correlation of markets excess return. This idea is that the integrated markets should move together in term of

excess return. Such close move should be observed by the high correlation. Adler and Dumas (1975, 1983) argue that the covariance matrix gives no information on the presence or absence of segmentation. Solnik (1977) has shown that this approach may be problematic in methodology for empirical measure. He shows that the efficient way to test for segmentation (integration) would seem to be to specify the type of imperfection which might create it and study its specific impact on portfolio optimality and asset pricing. The international integrated market hypothesis can only be tested against some null segmented hypothesis. Moreover, the correlation analysis in measuring the level of integration between markets is subject to several technical limitation. The substantial autocorrelation of stock market return could lead to bias estimation. It will understate the true correlation between the markets, which lead to inappropriate conclusion. In addition to the autocorrelation problem, another problem of the time series of the national stock market return is the non-stationarity. The non-stationary time-series also lead to bias estimation. Longin and Solnik (1995) point out that the correlation alone can not lead to the market integration conclusion. The direct benefit of correlation analysis is the contribution to the international diversification of equity portfolio as suggested by Levy and Sarnat (1970), Grubel and Fadner (1971), Lessard (1973), and Solnik (1974).

More recently, Bekaert (1995) measures the degree of equity market integration using the correlation of expected returns in emerging markets with expected returns in equity markets in industrial economies. He uses regression analysis to compute the correlation and the predictive power of his local and global instrumental variables. He also examines the relation between that measure, and three defined investment barriers. He finds that the emerging markets exhibit different degree of market integration with the U.S. market, and the differences are not necessarily associated with direct barriers to investments.

Penpas (1997) explains that the basic idea in the determination of international market integration is the basis of correlation. The integrated markets should move together. It implies the high correlation between the markets' return. However, Goldstein and Musa (1995) collected the four major findings in using the correlations in stock price indices across countries to measure the degree of stock market integration. They are :-

1. Solnik (1991), and Jorion (1992) studied the correlations of stock market movements across industrial countries and concluded that they are usually low to moderate in size[2].

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[2] Because of the existence of country-specific shocks, it is not likely that even a perfectly integrated capital market would exhibit perfect correlations of stock prices across countries. Still, one would expect higher integration to be associated with higher correlations of return across countries.

2. Jorion (1992) found no significant increase in the size of these correlations over the past twenty years or so[3].

3. Cross-country linkages are much tighter during periods of extreme turbulence, such as in October 1987, than during more tranquil times.

4. Hamao, Masulis, and Ng (1990) and Eun and Shim (1989) found consistently that the cross-country spillovers are asymmetric, with spillover from the U.S. market to others much stronger than in any other direction. Jorion (1992) gave notice that high correlation of *ex post* stock market returns between two countries does not necessarily imply close integration of these markets since expected returns could still differ.

Another methodology in this track is the cointegration. Arshanapalliei et al. (1995) try to study the linkage between US and Asian markets using the cointegration technique. The cointegration can be an alternative methodology to overcome the problem of non-stationarity. However, the cointegrated markets do not imply the integration of markets.

From the previous finding in using correlation analysis to determine the degree of capital market integration, it may be concluded that the correlation analysis is subjected to several limitations such as the statistical limitation resulting from substantial serial correlation of national stock market returns. The cointegration analysis is one of the attempts to overcome such problems. However, the cointegration does not imply market integration.

The flow of capital

One of the attempts to measure the level of market integration is the change in the magnitude of capital flows. Riedel (1997) explains in his study of capital market integration that the purest measure of the degree of capital market integration is the extent to which the law of one price holds in international capital markets. However, a much simpler measure he uses in his study is the change in capital flows. He proposes that a zero capital flow should be observed if the capital market is completely integrated given expected returns are continuously equal and no disturbances in capital markets exist. However, since there are disturbances in the real world, the integrated market will still experience the international capital flows. Furthermore, if there are changes in the level of openness to capital flows, they should be reflected in changes in the magnitude of international

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[3] It is examined that the correlations among national stock markets for 16 industrial countries, including Hong Kong and Singapore, reports that the correlations increased slightly as between 1959 – 1970 and 1971 – 1978. But it increases, on average, in the 1979 – 1986 period.

capital flows. The major drawback of this measure in measuring the level of market integration can be explained. The market integration is and *ex ante* concept, while the magnitude of capital flow is and *ex post* measure.

The equilibrium price of asset

Another important approach in measuring the level of market integration is to observe the price of assets. This approach assumes that the theoretically equilibrium price which compensates the relevant risk is the correct price. In this approach, there are a number of concepts to measure the level of integration. They are the models assuming no investment barriers, the models assuming the existence of investment barriers, and the models that allow both global and domestic factors influencing the price of assets.

The models assuming no investment barriers

In this approach, the deviations of asset returns from an equilibrium model of returns imply the deviations from integration. However, this approach relies on the construction assuming the market integration. If a market is completely integrated to world capital market, it is theoretically implied that only the global factors, which reflects the globally systematic risk according to CAPM, affect the expected return of asset. On the other hand, segmentation implies that only the domestic factors, which reflect the systematic risk, should be compensated for the price of asset. Deviation of expected return from the theoretical price, in integration setting, implies the imperfection of the market.

An advantage of this approach is that the effective barriers to capital flows, regardless of their source, should lead to actual deviations from the theoretically equilibrium price. Korajczyk (1996) measures the level of stock market integration for developed and emerging markets using APT in measuring the deviation from equilibrium price. He finds that market segmentation tends to be much larger for emerging markets than for developed markets. However, the measure tends to decrease over time. Mittoo (1992) investigates the Canadian stock market and US stock market using the ICAPM, in this framework. She concludes that the level of Canadian stock market integration to US stock market increases over time. Bae (1995) studied the level of integration of Korean stock market. He concludes that the Korean stock market becomes more integrated over time. The evidence supports his conclusion is that the premiums gained from Korean stock market is higher that from the world capital market but decreasing gradually. Gultekin, Gultekin, and Penati (1989) assume the APT to price assets in integrated markets setting. They test the hypothesis of stock market integration between Japan and US. They reject the models. The implication is that the

stock markets are not integrated. Wheatley (1988) points out that the test assuming mean-variance efficient benchmark portfolio used in asset pricing model is the joint test of the model and the market integration hypothesis. The rejection may be due to the misspecification of the model or the rejection of the market integration hypothesis. Cumby (1990), Campbell and Hamao (1992), and Bekaert and Hodrick (1990) apply the single latent variable model to test the market integration. This model attempts to avoid the problem of a misspecification caused by unobservable benchmark portfolio. They reject the market integration hypothesis. However, the rejection in their study, though not subject to the misspecification of the unobservable benchmark portfolio, can be either market segmentation or misspecification of the model.

More recently, Buckberg (1995) investigates the emerging stock markets to see whether they are part of the global financial market. He tests the markets based on conditional ICAPM with world systematic risk using GMM in the estimation. He finds that eighteen of the twenty largest emerging markets, including the countries used in this study, were integrated with the world capital market between December 1984 and December 1991. However, his test between 1977 – 1984 reveals that the same markets as tested in the more recent period reject the ICAPM. This implies that large capital inflows from industrial economies, beginning in the late 1980s, caused prices in emerging markets to reflect covariance risk with the world portfolio.

The models assuming the existence of investment barriers

Introducing the existence of investment barriers incorporated into the CAPM, Black (1974), and Stulz (1981a) try to avoid the false rejection of the market integration hypothesis testing. Black (1974) explains that the investment barriers can be in many forms such as institutional constraints, exchange control, or taxes. He conducts his work by introducing the barriers in the form of taxes. He assumes the symmetric taxes in his model. The symmetric tax means a tax that can be both positive and negative. The negative tax is feasible in real world as the interpretation of subsidy. Stulz (1981a) extends the work by introducing the asymmetric tax structure. Both Black (1974) and Stulz (1981a) measure the deviations of the asset price from the theoretically equilibrium price as evidence of investment barriers regardless of their sources. Their model assumes that the market is integrated. The zero deviations indicates the market integration. Wheatley (1988) tests the international stock markets using data between January 1960 and December 1985. He conducts the test based on the consumption capital asset pricing model. The measure of real consumption used is the real consumption of nondurables. The series is seasonally adjusted and in constant 1972 dollars and was converted into per capita terms using population data. By the test, Wheatly (1988) cannot reject the zero investment barriers hypothesis. However, he argues that the test might lack power because of measurement errors in the consumption data.

Errunza and Losq (1985) introduce another form of investment barrier. They specify the imperfection which relates to the assumed inability of a class of investors to trade in a subset of securities as a result of portfolio inflow restrictions imposed by some governments. In other words, they assume the unequal access assumption which approximates the reality of a mildly segmented world market. They find that the required return on an ineligible security is different from what the standard CAPM suggests.

The models that allow both domestic and global factors influencing asset price

Stehle (1977) conducts the first empirical test of segmentation versus integration in this strand. He cannot reject the hypothesis of segmentation nor of integration of US stocks relative to world market. Jorion and Schwartz (1986) point out that the test by Stehle (1977) based on the traditional Fama-McBeth (1973) cross-sectional, time-series approach. The approach is relatively less powerful than a Maximum Likelihood approach where the betas and cross-sectional parameters are estimated simultaneously. Jorion and Schwartz (1986) compare the international and domestic versions of CAPM in examination the issue of integration versus segmentation of the Canadian equity market relative to a global North American market. They construct a model which can be interpreted as a two-factor version of Ross (1976) APT. If the coefficient of the domestic systematic risk is not significantly different from zero, the two-factor model becomes the purely international CAPM. They employ the Maximum Likelihood approach to deal with data between 1968 – 1982. The finding is that the integration hypothesis is rejected which indicates that the source of segmentation can be traced to legal barriers based on the nationality of issuing firms.

Bekaert and Harvey (1995) propose the measure of level of stock market integration. It is a time-varying weight that is applied to the covariance and the variance. Their model allows for a different price of variance risk across countries, which depends on country-specific information, and a world price of covariance risk, which depends only on global information. They employ the regime switching model with maximum likelihood estimation to deal with twelve emerging stock markets data over December 1975 to December 1992. They find that a number of emerging markets exhibit time-varying integration and that the direct barrier may not be completely binding.

In this study, the law of one price is applied in measuring the degree of market integration. One thing that should be in mind is that the law of one price implies how well the capital could flow between countries and regions. Although people in different area could learn that there exists arbitrage opportunity in a given area (because of the informational efficiency), the arbitrage opportunity cannot be arbitraged because of the existence of barrier in capital mobility. The degree

that the arbitrage could work, hence, implies the degree of market integration. To measure the degree of stocks market integration is to measure the deviation or the mispricing from the theoretically equilibrium price.

$$E(r_{i,t}) = \alpha_{i,t} + E(r_{m,t})\beta_{i,t} \qquad (1)$$

where :-

$E(r_{i,t})$ is the expected return of asset i which is over the return on risk-free asset.
(The expected *excess* return)

$E(r_{m,t})$ is the expected *excess* return of market.
(The world market *excess* return)

$\beta_{i,t}$ is the amount of systematic risk.
(The covariance risk against the world market.)

ε_i is the residual of the model.

$\alpha_{i,t}$ is the relative measure of the degree of market integration.

From (1), in equilibrium market, it could be argued that if the domestic market is integrated to the world market, there should be no mispricing existence. The mispriced asset may occur any time, but it will be arbitraged out suddenly, given the informational efficiency and the frictionless of the market. It implies that the $\alpha_{i,t}$ should be zero in the case of fully integrated market. The relative degree of market integration, $\alpha_{i,t}$, could be compared to each other in the set using the same benchmark world market data. Theoretically, if there is no or less impediments for arbitrageur to do the arbitrage profit, the occurrence of mispricing, $\alpha_{i,t}$, will be arbitraged out at the time it is noticed. There will be no mispriced assets left for long time. It indicates the zero value of $\alpha_{i,t}$.

Korajczyk (1996) measured the degree of market integration using the multifactor pricing model, the Arbitrage Pricing Theory (APT), rather than the CAPM. The estimated $\alpha_{i,t}$ can be interpreted similarly to the $\alpha_{i,t}$ from CAPM estimation. However, there should not be a serious argument in pricing model based, the APT and CAPM, in the estimation of the degree of market integration. If there is an ambiguity in selecting the benchmark portfolio in CAPM, there are problems in determination of the factors include in the APT as the sensitivity to assets' expected return as well.

2.3. The implication of the measure

The $\alpha_{i,t}$ which is discussed in the previous section might be viewed as a well-known portfolio performance measure, the Jensen's alpha [Jensen (1968)]. The $\alpha_{i,t}$ is based upon the

capital asset pricing model (CAPM) of Sharpe (1964), Lintner (1965), Mossin (1965), and Black (1972). In portfolio performance measurement, the $\alpha_{i,t}$ value indicates whether the portfolio manager is superior or inferior in market timing and / or stock selection. Superior portfolio managers who can forecast market well, consistently select undervalued securities. He can earn relatively higher risk premiums than those of the inferior. A significantly positive value of $\alpha_{i,t}$ shows the ability of the portfolio manager because of the consistent gaining from arbitrage opportunity searching. The negative value of $\alpha_{i,t}$ shows the inferior management in portfolio investment due to the consistently negative residuals from the investment decision. However, the (Jensen's) $\alpha_{i,t}$ could measure the performance of portfolio management under an assumption of no restriction in investment strategy. In other words, the $\alpha_{i,t}$ implies how good of portfolio manager in finding and taking the arbitrage opportunity. In international investment, though the portfolio manager could see the opportunity, with the restriction and barrier in capital mobility, one could not take the opportunity until the expected return from the equivalent-risk asset is equalized. The consequence is that the $\alpha_{i,t}$ is not equal to zero. Thus, in the international setting, considering the $\alpha_{i,t}$ in term of performance measurement must be done carefully.

Discussion about the international portfolio performance measure is based on one necessary assumption that the market is well integrated. The explanation would concern the well known Roll's critique [Roll (1977)] because the Jensen's alpha bases on the CAPM. Changing in benchmark portfolio could yield inconsistent performance measured of the portfolio. This can be easily shown and understood when it is applied to the close economy. When open economy is in the case, the analysis is more complicated. In multinational portfolio investment, the $\alpha_{i,t}$ does not purely show the performance of fund manager. It also includes the effect of level of the market friction for international investment, regardless of the selection of benchmark portfolio. Thus, using Jensen's alpha in international portfolio performance measurement may be questionable.

When the $\alpha_{i,t}$ is estimated as the measure of relative degree of market integration, the problem in selecting the benchmark portfolio is comparatively less with the case of portfolio performance measurement. The selection depends straightforwardly on what markets to study in term of the integration.

2.4. The quality of stock market

Nittayagasetwat, Withisuphakorn, and Phoocharoon (1996) suggested that a high-quality secondary market for stock equity should have four characteristics. They are high liquidity, low volatility, high efficiency, and low transaction cost. Market with high liquidity implies that the market is

deep. Depth of stock market can be considered in term of the number of participants. In other words, there are potential sellers and buyers who are willing to take orders when the price of stocks deviates from its current market price. With deep market, it could be argued that the market would react to the shift in demand or supply quite efficiently. The efficiency in the reaction will lead to flexibility in adjustment to the equilibrium of market. Consequently, the deep market will show high volume (value) and high market turnover. Amihud and Mendelson (1986) suggested that the trading volume is the simplest way to measure the market liquidity. It is widely applied by both academicians and practitioners.

In a high quality market, securities' prices should not fluctuate substantially from time to time unless there is new information perceived. This implies the price continuity. If there is big instability in security price, in other words, there is big price discontinuity, the variance of security price and variance of security return will be undoubtedly high. Good quality market, thus, should not show high variance in return from the market. Markowitz (1959) proposed the measure of the market volatility by the volatility of security price and return.

The other two characteristics of good quality market, high efficiency and low transaction cost, is out of scope for this study. Although both characteristics are very important in the analysis of secondary market quality, it is quite difficult to find out the appropriate proxy. The study of the relationship between the degree of secondary stock market integration (which may be affected by policy that impact the market transaction cost and informational efficiency) and the quality of market, thus, limits to only the liquidity and volatility of stock markets.

2.5. Application of the level of stock market integration measure

Demirguc-Kunt and Levine (1996) investigates the measures of "stock market development" which are stock market size, market liquidity, market concentration, market volatility, institutional development, and integration with world capital markets. Also, they examine the relationships among the measures. The empirical findings are as followed.

1. Large stock markets are *more liquid, less volatile,* and *more internationally integrated* than smaller markets. The implication of this finding is that the market liquidity, volatility, and level of integration to world capital market are related. They may be driven by the size of the market.

2. Countries with strong information disclosure laws, internationally accepted accounting standards, and *unrestricted international capital flows* tend to have larger *and more liquid*

market. This implies that the level of integration, more or less, has impact on the liquidity of market.

3. Countries with markets concentrated in a few stocks tend to have smaller, less liquid, and less internationally integrated markets. This implies that the *liquidity and the level of integration* may be influenced by the *concentration of markets*.

4. *Internationally integrated* markets are *less volatile*.

Buckberg (1995) suggests that the larger capital inflows from industrial economies, beginning in the late 1980s, caused prices in emerging markets to reflect covariance risk with the world portfolio. This is consistent with Bekaert (1995) who assumes the positive relationship between his measure of capital market integration and the capital flows. Also, he assumes negative relationship between the measure of capital market integration and the domestic capital costs. Unfortunately, his empirical test could not reach strong supports for his two important assumptions. Tesar and Werner (1995) examines U.S. equity flows to emerging stock markets from 1978 to 1991. They analyze the volatility and turnover in emerging stock markets concerning the U.S. transactions in those countries. The correlation analysis in their study supports no evidence that U.S. investment activity contributes to either volatility in equity returns or to higher local turnover in emerging markets. This result is confirmed in Bekaert (1995). Levine and Zervos (1995) explore the effects of liberalization of capital controls. They identify fourteen countries that significantly reduced barriers to international capital and dividend flows in the 1980s. They show that these countries enjoyed rapid improvements in the functioning of their stock markets following liberalization. More recently, Levine and Zervos (1998) study the long-run economic growth and stock markets and banks. They find that stock market size, volatility and the level of integration are not robustly linked with growth.

The level of stock market integration and liquidity

Bhattacharya et al. (1997) explained the benefit of stock market integration in term of enhancing the role of the market. Integration expands the supply of investment resources by tapping foreign sources, increasing the demand for domestic securities. The *increased demand* will drive up the *price of domestic securities, raising the price-earnings ratio* and *reducing the cost of capital*. Increased foreign activity improves the depth and liquidity of domestic stock markets. A growing share of foreign investment is accounted for by institutional investors could magnify the positive impact on liquidity, since institutional investors are very active traders. Samuel (1996) finds that there is strong empirical evidence from the United States that institutional investors are very active traders.

With improved liquidity in domestic markets, investors will lower their demands for higher yields, reflecting their ability to sell securities at declining costs, and the cost of capital will decline. Also, Levine and Zervos (1996) explained that the integrated stock markets allow wider risk diversification and thereby facilitate the implementation of higher-return but riskier projects. The declining cost of capital and the enhanced risk diversification should induce the corporate sector to issue initial public offerings (IPOs) and secondary public offerings (SPOs). In addition, as liquidity in domestic stock markets improves, new domestic investors will be attracted to these markets. The empirical support to this issue is that the growth in both stock market capitalization and turnover in the major emerging markets is correlated with the level of foreign activity, as measured by the magnitude of portfolio equity inflows.

The level of stock market integration and volatility.

One of the impediment to the efficiency of market is the volatility in asset prices, which makes it difficult for market participants to distinguish whether changes in equity prices are due to noise or to new material information on fundamentals such as dividends or interest rates. For example, Summers (1986) found evidence of such inefficiencies because of volatility in industrial country markets. Integration has both positive and negative implications for the price discovery process in domestic stock markets. On the positive side, foreign investment *increases depth and liquidity* in domestic stock markets, thereby *reducing volatility*. Shallow markets are more prone to volatility since even small trades in these markets have a disproportionate effect on prices. On the negative side, other factors suggest that the integration may lead to an increase in the volatility of domestic stock prices and returns. This is because, with financial openness, domestic stock markets are exposed to new external financial shocks or these shocks may be transmitted more quickly across borders, such as changes in global interest rates, spillover effects from foreign stock markets, and investor herding. Some of these external shocks, particularly changes in global interest rates and certain stock market spillover effects, make asset prices and returns more volatile by affecting the fundamentals of an emerging market. The other shocks, such as investor herding and pure contagion effects, may change investment in a country even though its fundamentals are unaffected. These shocks are often the result of foreign portfolio investors having little access to information, worsening information asymmetries. Preversely, the improvements in liquidity, as discussed earlier, may make markets more susceptible to external financial shocks, since better liquidity reduces transaction costs and makes it easier for foreign investors to open and liquidate positions.

Information asymmetries may also increase volatility through interaction effects between domestic and foreign investors. For example, a defensive reaction by local investors to the sale of
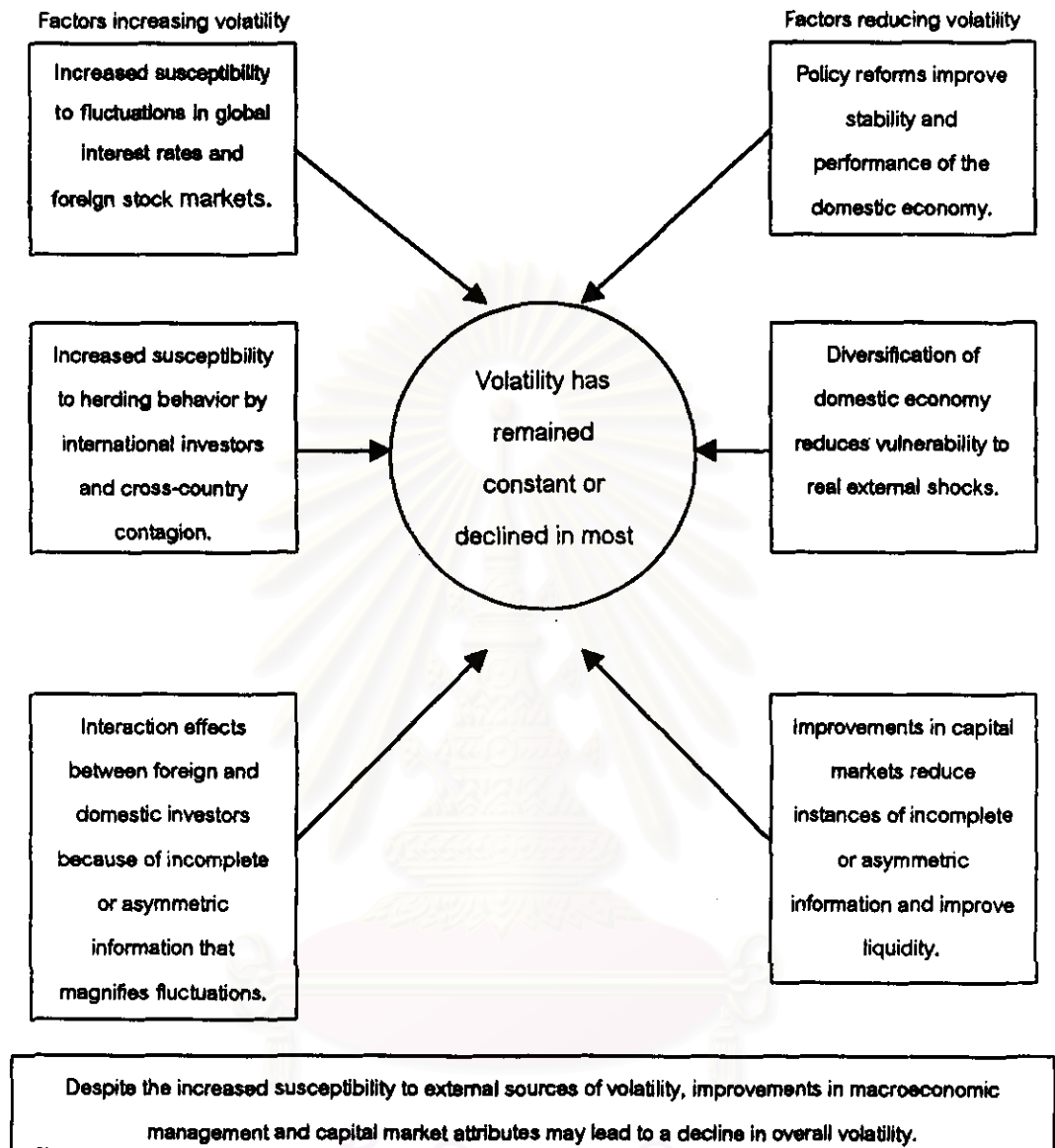
domestic securities by foreign investors, who in turn are responding to events overseas, may magnify the impact of foreign stock market spillover effects on the domestic market. Since local investors generally do not know why foreign investors are changing their holdings of domestic securities, they may react to such changes even though the fundamentals of the domestic market have not changed. Similarly, information asymmetries could result in foreign investors magnifying the impact of the behavior of domestic agents.

Most empirical studies have concluded that asset price volatility in emerging markets is generally higher than in developed countries but that volatility did not increase during the current inflow period. For example, Richards (1996) found no evidence to support the hypothesis that volatility in emerging markets increased in recent years concurrent with the boom in portfolio inflows. Indeed, his results suggest a decline in absolute volatility. IMF (1995) also found that absolute volatility of stock market returns did not increase during periods of high and volatile portfolio inflows in Korea, Mexico, and Thailand. Bekaert and Harvey (1995) observe that the volatility of returns remained unchanged or declined in 13 out of their sample of 17 countries after liberalization of their capital markets.

The reconciliation of the empirical results and the theoretical predictions could be explained by the figure 2.1. The volatility may originate from both domestic and international sources, as well as result from changes in country fundamentals or market inefficiencies. Although the markets became more susceptible to external financial shocks during the 1990s as they opened to world market, they were also undertaking policy reforms aimed at improving domestic fundamentals and stabilizing their economic policies. These economic reform programs also led to the diversification of their economies, which reduced vulnerability to traditional external shocks such as changes in terms of trade. In addition, many developing countries during this period also improved their capital markets, reducing excess volatility arising from information asymmetries and other market imperfections, including foreign investor herding and pure contagion that may be caused by incomplete or asymmetric information. All of these effects have reduced fundamental volatility from traditional sources of shocks and may have moderated the potential for volatility arising from new sources.

Figure 2.1.

Factors Affecting Volatility of Asset Prices in Emerging Markets

Factors increasing volatility

Factors reducing volatility

Increased susceptibility to fluctuations in global interest rates and foreign stock markets.

Policy reforms improve stability and performance of the domestic economy.

Volatility has remained constant or declined in most

Increased susceptibility to herding behavior by international investors and cross-country contagion.

Diversification of domestic economy reduces vulnerability to real external shocks.

Interaction effects between foreign and domestic investors because of incomplete or asymmetric information that magnifies fluctuations.

Improvements in capital markets reduce instances of incomplete or asymmetric information and improve liquidity.

Despite the increased susceptibility to external sources of volatility, improvements in macroeconomic management and capital market attributes may lead to a decline in overall volatility.

Source : *A World Bank Policy Research Report on Private Capital Flows to Developing Countries, The Road To Financial Integration, 1997, p. 321*

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