

The Comparative Performance and Structural Stability of the Selected Asian Emerging Stock Markets

M.T. VAZIRI

This study analyzes the comparative performance of the emerging markets of Pacific Basin markets with respect to U.S. stock market and estimates the diversification benefits to the American investors utilizing a recent sample from January 1994-December 1996. Particular attention is placed on the analysis of time-variant coefficients derived from a rolling regression model. The study concludes that the extent of the benefits of portfolio diversification of the U.S. investors into Pacific Basin markets depend on at least two important factors: (a) the reduction of the portfolio risk without changing its mean and (b) variance of foreign index and its correlation with the U.S. index. A limited liquidity and turnover taxes and other barriers to investors in the Pacific Basin Stock Markets could cause the observed returns to exceed the returns available to U.S. investors.

Introduction and Need for the Study

There is a strong focus in the literature on the performance of Pacific Basin Stock, and structural stability of the other emerging markets. Margaret M. Price (1994), Keith Park and Antoinette W. Van Agtmael (1993), and Kolodny/Resnick (1991) have emphasized the diversification through investing in emerging stock market to reduce the variance of a portfolio of domestic stocks without reducing the expected return. Hamao, et.al. (1990) has examined the time-varying volatility of international stock prices. A vector autoregression approach investigating the transmission of innovations across markets is demonstrated by Eun and Shim (1989) Cumby (1990) have shown that increased international equity market integration is consistent with consumption based asset pricing models.

Failure to consider the inter-temporal behavioral relationship between stock market indices can lead to an overstatement of the benefit of international investment for reducing portfolio risk. The presence of a stable relationship between market returns facilitates the selection of an ex ante optimal investment

*Prof., California State University, San Bernardino

strategy. An unstable relationship indicates that the efficient frontier is constantly changing, which may result in the selection of a suboptimal portfolio strategy (Hamao, et.al. -1990). However, a superficial study of these markets could lead to overestimation of the gains and under-estimation of the risks for American investors for the following reasons: First, because U.S. returns usually lead rather than lag behind emerging returns (more specifically markets of Pacific Basin) daily return comparisons will dilute the diversification benefits to the investors {Hamao and Masulis (1988)}. Second, long -run holding of the emerging stocks will reduce the diversification benefit as these stocks do not follow a random walk {Baily, Stulz and Yen (1990)}. Finally, limited liquidity, turnover taxes, and other barriers to investors in these markets could cause the observed returns to exceed the returns available to U.S. investors (Baily 1990).

There is very limited research in the literature that analyzes the direct benefit of international portfolio diversification into the Pacific Basin Stock Markets. Most of the researchers estimated these benefits, using daily returns for indexes from these markets. There is a limited comprehensive study to analyze the comparative performance of all emerging markets with respect to the U.S. market and American investors.

Objective of the Study

In recent years, the world total market capitalization has been increased from \$2,534 billion to 12,623 billion according to 1996 IMF International Financial Statistic report. Among the world stock markets, the emerging markets showed the greatest percentage gains as American investors benefited from high returns in these strong markets. Regional weights of emerging markets based on market capitalization in US dollars has increased several fold since 1996. However, there is still a great deal of uncertainty in the performance of these markets (Hamao, et.al. 1990). Extending modern portfolio theory to the international arena suggests that diversification among markets having imperfectly correlated returns is an effective way to reduce portfolio risk without impairing the portfolio's expected return. Applying the market model framework to international investment implies that portfolio risk is determined by the degree of variability among international stock indices (Masulis-1988).

The main objectives of the study are: (1) to examine the structural stability of the emerging markets of Asian countries utilizing a recent sample from January 1994- Decemebr 1996, (2) to analyze the comparative performance of emerging markets of Pacific Basin markets with respect to the U.S. stock market, and (3) to estimate the diversification benefits to the American investors. The study places particular attention on the analysis of time-variant coefficients derived from a rolling regression model.

Methodology and Data Collection

The study utilizes monthly dollar returns for selected Pacific Basin market indexes (Singapore's Straits Times Industrial Index, Tokyo Stock Price Index, Korea Composite Stock Price Index, Taiwan Stock Weighted Stock Index, Stock Exchange of Thailand Index, the Standard and Poor's 500 index series which are obtained through S&P's Security Price Index record. An inter-temporal behavioral relationship model between the selected stock markets indices has been used and the dollar value of the monthly returns for the foreign stocks indices has been measured by the share price index of country i at t , discounted to the spot exchange rate expressed as units of country i currency for one US dollar at time t . An Ordinary least square regression equation has been generated as follows:

$$K_{it} = \alpha_i + \beta_i K_{it}^* + \epsilon_{it} \quad (1)$$

Where K_{it}^* is the US stock market return or the world stock return, K_{it} is the exchange rate adjusted Asian stock return, α_i and β_i are constants, and, ϵ_{it} is an error term.

Particular emphasis is placed on analyzing the stochastic patterns of the coefficients generated through rolling regression analysis to analyze the risk-reducing properties of US investment portfolio diversification through emerging Pacific markets.

Summary Analysis and Conclusion

The preliminary results of the study (tables 1 & 2) indicate that the US stock market returns measured by the S&P 500 index are positively related to all selected emerging Pacific Markets. The slope coefficient for Taiwan and Singapore are positively related to the US stock market, but the Thailand index is the only coefficient statistically significant at the 1% level. One should notice that the regression equation assumes that the model is constant over time and measure the average association for the period. In order to measure changes in the relationship and allow the estimated coefficients to absorb the new information and also to analyze the risk reduction property of US investment portfolio diversification, a rolling regression stochastic coefficient has been calculated. All of the estimated stochastic coefficients in table 2 are significant at 1% level. The result of the test indicates that the auto-regression model measure the changes in the relationship over time and follows a stochastic process. A parameter constancy analysis, such as Box/Jenkins tests, Runs tests well as Chow test are required to analyze the nature and behavior of the pacific emerging stock markets returns. One should notice that the volatility of the markets is high relative to their means. The extent of the benefits of portfolio diversification of the U.S. investors into Pacific Basin markets depends on at least two important factors: (a): the reduction of the portfolio risk without

changing its mean and (b): variance of foreign index and its correlation with the U.S. index. Using the monthly dollar return, the analysis shows that the benefits for the American investors are considerable, as the portfolio risk for U.S. investors could have reduced substantially by investing in Pacific markets. Although the correlation between markets could change (as Pacific Markets Returns lag behind the U.S. returns), the adjustment to monthly return could provide the same efficient estimation of benefits from diversification of portfolio into Pacific Basin markets, as would daily returns, without major overestimation of the returns.

The analysis also shows that the Pacific Basin markets have high positive correlation and co-variance among themselves and low correlation with the U.S. index. This means that the market indexes in these countries are likely to move in the same direction, lagging behind the U.S. index. The behavior of the volatility ratio (standard deviation/average index) for the Pacific Basin markets reflects the potential for high stock market growth in these countries than the United States for the investors.

TABLE 1: Correlation Coefficient and Regression Estimates of the US Stock Market Return Compare to the Selected Emerging Markets.^{1,2} (1994-96) model: $Kit = \alpha_i + \beta_i Kit^* + \epsilon_{it}$

Country	α_i	β_i	R ²	T
Japan	-0.0162	0.5974	0.0254	2.7117
Korea	0.0203	0.0793	0.0012	2.5704
Singapore	-0.0823	3.2136	0.0265	2.5967
Taiwan	-0.0596	2.9874	0.2981	2.1036
Thailand	0.0198	1.8903	0.1098	2.6811

1. Significance at 1% level.

2. Kit^* is the US stock market return, Kit is the exchange rate adjusted foreign stock return, α_i and β_i are constants, and, ϵ_{it} is an error term.

TABLE 2: The Rolling Regression Model Estimates and β Coefficients for the US Stock Markets Compare to the Selected Emerging Markets¹ (1994-1996)

Country	Constant	Stochastic			RMSE
		Coefficient	T	R ²	
Japan	-0.0162	0.0913	2.5915	0.0254	0.278
Korea	0.0203	0.0065	2.6908	0.0012	0.4378
Singapore	-0.0823	0.0296	2.6913	0.0256	2.2631
Taiwan	-0.0596	0.0285	2.6968	0.1996	2.9834
Thailand	.0198	0.2908	2.6936	0.1187	0.5098

¹ Significance at the 1% level.

REFERENCES

- Maldonado, R. and A. Saunders. "International Portfolio Diversification and the Inter-Temporal Stability of International Stock Market Relationship, 1957-78," *Financial Management*, Autumn, 1981, 54-63.
- Melamed, Leo. *The handbook of World Stock and Commodity Exchange*. London: Blackwell Finance, 1990.
- Moody's International Manual. New York: Moody's Investors Service, Inc., 1992, a49-a59.
- Panton D. B., V.P. Lessig, and O. M. Joy. "Government of International Equity Markets: A Taxonomic Approach," *Journal of Financial and Quantitative Analysis*, September 1976, 415-432.
- Philippatos, G. C., A. Christofi, and P. Christofi. "The Inter-Temporal Stability of International Stock Market Relationship: Another View," *Financial Management*, Winter 1983, 63-69.
- Standard and Poor's Security Price. New York: S&P's Corporation Publisher's, 1992, 206-209.
- United Nation. Dept. of International Economic and Social Affairs. *Monthly Bulletin of Statistics*. 10 vols. 1988-92.
- United States. International Monetary System. *International Financial Statistics*. Washington: IMF, 1993.
- Watson, J. "The Stationary of Inter-Country Correlation Coefficients: A Note," *Journal of Business Finance and Accounting*, Summer 1980, 297-303.