

THE BENEFIT OF INTERNATIONAL PORTFOLIO DIVERSIFICATION IN ASIAN EMERGING MARKETS TO THE U.S INVESTORS

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ABSTRACT

Findings of previous studies have revealed the benefits of international portfolio diversification between developed and emerging markets and this phenomenon has motivated us to carry out further research on this topic. Specifically, this study examines the benefits of international portfolio diversification among five Asian emerging markets (Malaysia, Thailand, Indonesia, China and India) and the United States during the period from 2006 to 2012. We apply Johansen's (1988) cointegration methodology to test the long-run relationships between these markets and Granger's (1969) causality methodology in order to capture short-run cointegration. The results show that all cointegration tests bring evidence of no long run relationships among five Asian markets and the US market while short-run relationships exist between Malaysia, Indonesia, and Thailand with U.S market. The results of this study signify that there are some diversification benefits for US investors by investing into Asian emerging markets in long term horizon.

Keywords: Portfolio diversification, Asian emerging markets, cointegration

INTRODUCTION

Many institutional and individual investors from all over the world and U.S are attracted by diversification benefits from exposure to emerging markets (Bekaert and Urias, 1996). The issue of international portfolio diversification arose in 1974 when the first investment of pension fund occurred outside the USA by Morgan Guaranty. Due to the high return in foreign capital markets, investors are attracted to invest outside the USA (Fadhlaoui et al., 2010). According to Byers and Peel (1993) if there is cointegration between national stock markets, the possibility of benefit of international diversification of stock markets decrease. In recent years, due to the market liberalization and deregulation, there is more integration relationship among financial markets from all over the world for the purpose of greater correlation between financial markets. As a result of increasing correlation between national stock markets, the benefits from international diversification have been reduced. In other words, the benefits from international portfolio diversification are high when the correlation coefficient between markets is lower, and inversely if correlation among markets is higher, the benefit is low (Fadhlaoui et al., 2010). As a result of higher integration between developed markets, U.S and other investors have focused more on the diversification in emerging markets that have yielded greater benefits. Moreover, as growth has slowed in the U.S and Europe in recent years due to the sub-prime mortgage and debt crisis in these countries, together with continued growth in the Asian emerging markets has led foreign investors to switch to Asian region for their investment. In addition, these investors are also now more inclined to invest in those Asian markets that hold more promise for international portfolio diversification, like China and India.

PROBLEM STATEMENT AND RESEARCH OBJECTIVES

As developed markets have integrated over time, investors looking for a way to gain from their investments which this issue encourages us to research about the significance of international portfolio diversification in emerging markets. Considering that Europe and Latin America emerging markets have confronted with financial and debt crisis in recent years, fund managers and investors seek to other emerging markets like Asian emerging markets. Diversification in those markets supply higher benefits for foreign inventors. Therefore, this study attempts to answer the question that "Is there any potential for international portfolio diversification among the Asian markets to the U.S investors?"

The aim of this research is to identify the potential diversification benefits for American investors in five Asian equity markets namely China, Malaysia, Thailand, Indonesia, and India, over the recent period from the year 2006 to 2012. Despite the diversification benefits to short-term investors is revealed by correlation test, the long term relationship among these Asian markets and U.S market are determined by applying the bivariate and multivariate cointegration method. When there is long-run comovement, it is suggested greatly overemphasized gains for US investors who choose these markets to diversification in long term.

LITERATURE REVIEW

International portfolio diversification can facilitate the possibility of reducing risk if the degree of correlation with an economy is relatively high. In other words, to support the gains of diversification in an international portfolio, low correlation between national equity markets is usually presented as proof. Several studies have demonstrated the gains from portfolio diversification between developed and emerging markets. Markowitz (1952) has pioneered the work on this subject but since then, abundant research has been conducted on the benefits of portfolio diversification.

Early research in this area, like for instance, Grubel (1968) find that portfolio diversification at an international level was the basis of a newly-found type of universal welfare benefits from global economics. Lessard (1974) reports that the low correlation between markets of industrial countries and emerging markets presents the benefit of the portfolio diversification. Levy & Sarnat (1970) and Solnik (1974) indicate that there is the possibility of not having an attainable level of performance within a single economy, if investors add international assets to the domestic portfolio. However, a part of domestic economy risk is eliminated by spreading investment among different independent countries. Investors gain from international investment if values of cross-country correlations of returns are low.

Other recent researches recognize the short term relationship among the equity markets and the benefits of international diversification. Errunza and Padmanabhan (1988) mention that it is desirable to diversify into markets that are emerging and important to focus on the selection of countries in the management of a portfolio that is to be truly global. Divecha et al. (1992) report if stock markets' returns have highly volatile trend, those markets should be examined separately. It has been observed that there can be a reduction of risk to the total portfolio when Emerging Stock Markets (ESM) shares are incorporated within a portfolio, usually without losing the offered returns. According to Bailey and Stulz (1990), developed world markets have become more closely linked and there has been significantly greater interest in the benefits of diversification in emerging markets. This situation is the result of several factors such as various restrictions on the flow of international capital, exchange controls, absence of or limited free trade, and ignorance of foreign securities due to inadequacy of information as well as the bias of investors toward other securities.

Several studies by researchers like Roll (1988), Hamao et al. (1990), and Meric and Meric (1997) reveal a substantial growth in the number of correlations and volatility transmissions among the various equity stock markets in 1987 when the international equity market crash occurred. New perspectives on this topic have been the result of current research pertaining to long run relationships among time series with similar trends. It has been demonstrated by Kasa (1992) and Watson (2006) that when the value of estimated correlations is low between two countries, it is no guarantee that they are independent. When long run cointegrating relationships exist between national stock markets, the correlation of returns is seen as part and parcel of investment. The longer period of investment, the greater interdependence of cointegrated markets that constrains the potential of their diversification. It can be seen therefore that over the long term, there is overestimation of the benefits that can be derived from the diversification of the international portfolio.

Cointegration techniques have been widely used by many researchers to examine the relationship and co-movements among markets of developed countries with emerging ones in long-term. They investigate how these effects can be beneficial to investors due to their investments in emerging market by international diversification. Kasa (1992) and Arshanapalli and Doukas (1993) results show that the equity markets of America and Europe are cointegrated. When there are such linkages, the gains of international diversification in those European markets are negatively affected.

The absence of any cointegration relationship and co-movement among the U.S market and some equity markets of emerging countries such as Pacific Basin, Latin America and the Mediterranean regions has been shown by DeFusco et al. (1996). Based on the findings, gains from international diversification may exist for American investors in long and short terms in aforementioned regional emerging markets.

It has been investigated by Kanas (1998) the benefit of international diversification in some major European markets to American and the UK investors. He concludes that there is no cointegration relationship among the U.S market and these European markets, therefore; there is possibility of risk reduction for American investors by diversification in European markets.

Several studies apply cointegration method in order to examine the relationship between developed markets with the markets of Middle East and MENA area which have produced mixed findings. Darrat et al. (2000) argue that there is segmentation between three markets (Morocco, Jordan and Egypt) globally; however, they are segmented in their region. Their findings conclude that foreign investors can benefit from diversification in these markets. Neaime (2005) provides evidence of varying degrees of integration among MENA region and also some developed markets such as the UK, the U.S and the French markets. Another investigation by Lagoarde-Segot and Lucey (2007) focuses on the Middle Eastern and North African (MENA) equity markets. Their study indicates the availability of better gains from international diversification, whether it is transacted in U.S dollars or in local currencies.

Emerging markets of European countries such as Poland, the Czech Republic and Hungary also are studied by Gilmore and McManus (2002) which they conclude that diversifying investment portfolio in these countries promised better returns due to the absence of co-movement between these markets and the U.S market in short and long period. Fadhlou et al. (2010) also find that the new Central European markets are not cointegrated as a group as well as with the G7 developed markets. Their investigations also show that new markets can offer significant benefits from international diversification particularly for developed countries' investors.

In summary, the results of past studies have demonstrated the benefit of international portfolio diversification between developed and emerging stock markets. However, studying on investment possibility in Asian equity markets are less in recent years. Therefore, this study seeks to examine the benefit of international diversification in Asian equity markets of China, Malaysia, Indonesia, Thailand and India to American investors due to the importance of these equity markets in economic growth and its impact on financial markets to foreign investment. In order to investigate the long-run relationships among these markets, this paper employs the recent cointegration method. This study attempts to fill a gap in the knowledge by exploring the integration using more current data.

METHODOLOGY AND DATA

In this study, we employ the cointegration method to investigate the opportunities for international portfolio diversification in some emerging markets in the Asian region to the U.S investors. The aim of this test is to determine the long term relationship among the five emerging Asian countries namely Malaysia, Thailand, Indonesia, China and India in terms of similar stock price movement or trends while accepting that there can be short term differences. If indeed there is proof that such similarities in trend exist over the long term, it would indicate to investors with long term views, that the short term differences are indeed exaggerated. Granger (1981, 1983) and Engle and Granger (1987) developed the concept of co-integration on the basis of the belief that if there is a long term con-integration connection between “two or more non-stationary time series then the deviations from their long-run path are stationary”.

Before determining the co-integration, we examine how the co-integration of the market indices was, to make sure of its equality for all series. This is complemented by Dickey-Fuller and Phillips-Perron (PP) unit root tests to determine the non-stationarity of the series. The choice of the ADF test is due to its popularity while the reason for using the PP test is because of its greater versatility which allows for other options in examining stationarity of time series data. As for confirmation of the proper number of lag length, we use the Akaike Information Criterion (AIC). In addition, we have applied the Johansen test (1988) in order to determine the cointegration relationship between the time series which this technique shows us the number of cointegrated vector of the index series. Finally, in order to determine the short term causal relationship between the index series of emerging and developed markets, we have used the Granger causality test (1969).

The data of this study is the S&P/IFCI weekly indices of China, Malaysia, Thailand, Indonesia and India. All indices are in terms of USD and their common sample covers the period from January 2006 to January 2012 which in total consists of 314 observations. The U.S equity market is represented by the S&P500 index as this index is a benchmark for well-diversified American investors. The S&P/IFCI Composite is a liquid and investable leading emerging market index. The S&P/IFCI is useful as a benchmark for the emerging market equities component of an investor's portfolio and to monitor the movement of stock and mutual funds in the market of a particular emerging country and is deemed more suitable for determining the benefits of diversification than local stock price indices due to their standardization.

FINDINGS AND DISCUSSION OF RESULTS

DESCRIPTIVE STATISTICS

Descriptive statistics for weekly stock returns of China, Malaysia, Thailand, Indonesia, India and the United States markets are showed in Table 1. Among all the markets, Indonesia market index has the highest average returns of 0.004 and the U.S market shows the lower average return of 0.001.

The maximum return varies between 0.082 for Malaysian stock market and 0.209 for Indian market. The minimum returns fluctuate between -0.252 for Indonesian market to -0.103 for Malaysian stock market. The standard deviation measure the degree of risk which Indonesian stock index has the highest level of risk (0.049), followed by the China and Indian stock index (0.045). The markets of Malaysia and the U.S present the low level of risks which are 0.026 and 0.030 respectively. Considering that distributions for all markets have positive kurtosis, all index returns series are leptokurtic. Meanwhile, the skewness shows that there is an asymmetric distribution among these index returns which the null hypothesis of normality for all the index return series can be rejected.

Table 1: Summary statistics of weekly index return series

	Country					
	China	India	Indonesia	Malaysia	Thailand	USA
Mean	0.003	0.002	0.004	0.003	0.003	0.001
Median	0.005	0.006	0.008	0.005	0.004	0.001
Maximum	0.185	0.209	0.203	0.082	0.132	0.120
Minimum	-0.193	-0.192	-0.252	-0.103	-0.242	-0.182
Std. Dev.	0.045	0.045	0.049	0.026	0.039	0.030
Skewness	-0.060	-0.152	-0.630	-0.643	-0.716	-0.502
Kurtosis	5.009	5.194	6.759	4.523	7.824	8.256
Jarque-	52.872	64.007	205.077	51.872	330.281	373.538

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Probability	0	0	0	0	0	0
<i>N</i>	313	313	313	313	313	313

Note: The numbers of stocks included in the S&P/IFCI indices are 339 for china; 91 for Malaysia; 73 for Thailand; 80 for Indonesia; and 219 for India. Source: S&P/IFCI, *Emerging Indices, December 30, 2011*.

Correlation Coefficient Between Equity Return Series

We present the correlation coefficient of weekly equity return series between five Asian emerging markets and the U.S market in Table 2. There is positive and higher correlation coefficients among Asian markets compared with the U.S equity market. The low correlation level is between U.S and Malaysia which is 0.459. The highest correlation is found between China and Malaysian markets which is 0.712 followed by the pair of China-India markets of 0.693. There is low correlation coefficients

Table 2: Correlation coefficients of weekly stock return series

	CHINA	INDIA	INDONESIA	MALAYSIA	THAILAND	USA
CHINA	1	0.693*	0.642*	0.712*	0.557*	0.608*
INDIA		1	0.609*	0.675*	0.543*	0.561*
INDONESIA			1	0.662*	0.594*	0.491*
MALAYSIA				1	0.574*	0.459*
THAILAND					1	0.463*
USA						1

Note: *Significant at 1 percent level.

between the U.S equity market and emerging markets which they varies from 0.459 between the U.S and Malaysian market to 0.608 between China and the U.S markets. Based on these findings, there is possibility of diversification benefits to the U.S investors by investing into Asian emerging equity markets in the short run.

In the next part we apply cointegration method in order to determine that these short run linkages are proper measure to obtain gains from international diversification in Asian emerging equity markets during long period.

Results Of Unit Root Test

The existence of unit root in time series of stock prices is an indication that they are not stationary. Table 3 shows the results of the stationarity tests of the Dickey-Fuller and Philips-Perron tests.

Table 3: Unit root tests for weekly stock indices

Country index	Index Level		First Differences	
	ADF	PP	ADF	PP
CHINA	-2.18	-2.18	-16.77*	-16.77*
INDIA	-2.07	-2.11	-10.39*	-17.12*
INDONEISIA	-1.23	-1.23	-19.06*	-19.06*
MALYSIA	-1.18	-1.18	-10.94*	-17.08*
THAILAND	-0.91	-1.03	-8.97*	-18.45*
US	-1.54	-1.54	-18.71 *	-18.71*

Note: *Significant at 5 percent level.

These results indicate the non-stationary position of the level series and the null hypothesis of a unit root which cannot be rejected at the 5 percent confidence level. However, the stationnarity in the first differences series rejects the null hypothesis. As such, the indication is that all index series in the region are integrated of order I (1) during the sample period.

Results Of Johansen Cointegration Test

The Johansen (1988) test is then employed to examine the cointegration relationship between pairwise the U.S equity market with any of Asian equity markets.

Table 4: The results of Bilateral Johansen cointegration test

Version A: No intercept in CE, no deterministic trend in data							
Hypotheses		5%					
H_0	H_A	Critical Values	US- China	US- India	US- Indonesia	US- Thailand	US- Malaysia
		Trace Test					
$r=0$	$r=1$	12.32	4.89	4.01	3.74	2.17	4.68
$r \leq 1$	$r=2$	4.12	0.11	0.09	0.005	0.24	0.07
		Maximum eigenvalue test					
$r=0$	$r \geq 1$	11.22	4.78	3.91	3.73	1.93	4.61
$r \leq 1$	$r \geq 2$	4.12	0.11	0.09	0.005	0.24	0.07
Conclusion			$r=0$	$r=0$	$r=0$	$r=0$	$r=0$
Version B: Intercept in CE, no deterministic trend in data							
Hypotheses		5%					
H_0	H_A	Critical Values	US- China	US- India	US- Indonesia	US- Thailand	US- Malaysia
		Trace Test					
$r=0$	$r=1$	15.49	7.16	6.37	3.68	3.78	3.98
$r \leq 1$	$r=2$	3.84	1.86	1.68	1.30	1.19	1.79
		Maximum eigenvalue test					
$r=0$	$r \geq 1$	14.26	5.30	4.68	2.38	2.59	2.19
$r \leq 1$	$r \geq 2$	3.84	1.86	1.68	1.30	1.19	1.79
Conclusion			$r=0$	$r=0$	$r=0$	$r=0$	$r=0$

Note: The 5 percent critical values are based on Osterwald Lenum (1992).

We apply two forms of the Johansen method: one with intercept in the cointegrating equation (CE) and the other without intercept and trend. We choose the lag structure based on the Akaike Information Criterion (AIC). Table 4 shows that there is no cointegration between Asian equity markets and the U.S equity market that indicates there is no cointegration vector and no liner relation that is stationary. Therefore; the null hypothesis that the rank of the coefficient matrix is equal to zero cannot be rejected.

Even though the cointegration relationship on a bilateral method does not exist among the U.S market and each of Asian countries, there is possibility of cointegration between these markets as a group. In order to examine this issue we apply multilateral Johansen test. The findings reported in Table 5 indicate the multilateral cointegration does not exist among five Asian equity markets which signify there is no linkage among these markets in the long-run. Lack of cointegration vector among Asian

Table 5: The results of Multilateral Johansen cointegration test

Version A: No intercept in CE, no deterministic trend in data			
Hypotheses		Maximum eigenvalue test	Trace Test
H_0	H_A		
$r = 0$	$r = 1$	42.28	93.27
$r \leq 1$	$r = 2$	22.72	50.98
$r \leq 2$	$r = 3$	14.83	28.25
$r \leq 3$	$r = 4$	7.49	13.42
$r \leq 4$	$r = 5$	5.35	5.92
$r \leq 5$	$r = 6$	0.57	0.57

Conclusion	$r=0$	$r=0$
Version B: Intercept in CE, no deterministic trend in data		
Hypotheses	Maximum eigenvalue test	Trace Test
H_0	H_A	
$r = 0$	$r = 1$	42.66
$r \leq 1$	$r = 2$	23.19
$r \leq 2$	$r = 3$	14.97
$r \leq 3$	$r = 4$	7.30
$r \leq 4$	$r = 5$	2.56
$r \leq 5$	$r = 6$	0.89
Conclusion	$r=0$	$r=0$

Note: The 5 percent critical values are based on Osterwald Lenum (1992).

equity markets can be explained by their segmentation in the long term. Due to the lower risk in these Asian equity markets, investors can gains from portfolio diversification.

Despite the fact that the cointegration tests do not indicate the existence of any long term linkage between the U.S and the five Asian equity markets, it is possible that there is a short-term relationship. As there is no cointegration of the series, the Granger causality method with no error correction term can be applied to investigate this matter.

Table 6: Granger-causality technique

	F-statistics	Probability
Panel A: US and China		
China does not Granger Cause USA	0.29	0.74
USA does not Granger Cause China	2.75	0.07
Panel B: US and India		
India does not Granger Cause USA	0.09	0.91
USA does not Granger Cause India	2.50	0.08
Panel B: US and Indonesia		
Indonesia does not Granger Cause USA	0.49	0.61
USA does not Granger Cause Indonesia	6.32	0.002 ^a
Panel B: US and Malaysia		
Malaysia does not Granger Cause USA	0.03	0.97
USA does not Granger Cause Malaysia	3.70	0.03 ^a
Panel B: US and Thailand		
Thailand does not Granger Cause USA	0.54	0.58
USA does not Granger Cause Thailand	6.28	0.002 ^a
Panel D: Asian Emerging Markets		
India does not Granger Cause China	0.03	0.97
China does not Granger Cause India	4.21	0.02 ^a
Indonesia does not Granger Cause China	0.52	0.59
China does not Granger Cause Indonesia	4.96	0.01 ^a
Malaysia does not Granger Cause China	0.03	0.97
China does not Granger Cause Malaysia	0.70	0.50
Thailand does not Granger Cause China	0.16	0.85
China does not Granger Cause Thailand	1.83	0.16
Indonesia does not Granger Cause India	0.62	0.54
India does not Granger Cause Indonesia	3.60	0.03 ^a
Malaysia does not Granger Cause India	0.68	0.51
India does not Granger Cause Malaysia	1.81	0.16
Thailand does not Granger Cause India	0.60	0.55

India does not Granger Cause Thailand	1.91	0.15
Malaysia does not Granger Cause Indonesia	2.83	0.06
Indonesia does not Granger Cause Malaysia	0.04	0.96
Thailand does not Granger Cause Indonesia	2.87	0.06
Indonesia does not Granger Cause Thailand	4.67	0.01 ^a
Thailand does not Granger Cause Malaysia	0.06	0.94
Malaysia does not Granger Cause Thailand	3.89	0.02 ^a

Note: ^a Significant at the 5 percent level.

Results Of Granger-Causality Test

The Granger-causality technique is used to test the pairwise of any individual of Asian indices with the U.S series and it is shown in Table 6. It can be seen therefore that there is a Granger causality spanning the China market with the India and Indonesia markets. There is causality in one direction between the Indonesian, Thailand and Malaysian stock markets with the U.S stock market. These three markets have short run relationship with the U.S market. This signifies that there are no portfolio gains to the U.S investors by diversifying their investment into these three equity markets namely Indonesia, Thailand and Malaysia in the short run.

Summary and Conclusions

This study examines the international portfolio diversification opportunities to U.S investors in five Asian emerging equity markets namely China, Malaysia, Indonesia, Thailand and India. In the beginning of the 1990, liberalization is started in Asian equity markets. By this liberalization, international investors can be attracted to invest in these markets which cause the high degree of international capital flow to these countries.

The findings of unit-root technique reveal that each stock index has non-stationary feature over time, but becomes stationary in its first difference. The Johansen cointegration test is employed to analyze long-run relationships among China, Malaysia, Thailand, Indonesia and India equity markets. The results show that there is lack of long term relationship between these markets and the developed markets of the United States. In the short-term, there is unidirectional causality exists between Malaysia, Thailand and Indonesia markets with the U.S market. The short run relationship among the equity markets was due to several reasons, one of which could be the closeness of their economic ties by way of intra-ASEAN trade and investment that has brought about the indirect linkage of their stock indices (Lim et al., 2003). Another reason could be the growing interdependence between both emerging and developed equity markets post 1987. In addition, after the 1987 Stock Market Crash there is an increasing interdependence between most of the developed and emerging markets. Following the 1997 Asian Financial Crisis there was even greater interdependence among these countries. As a result, the minimizing of risk in international portfolio diversification was curtailed post the 1987 Stock Market Crash. However, this research suggests that the Indian and Chinese markets were not impacted by the U.S market and vice-versa, consequently American investors can gains from portfolio diversification of these two markets in both the long and short time horizon. We leave for further research to investigate along these lines and check whether it would be beneficial for US investors to invest in other emerging stock markets. The benefits of international portfolio diversification is not only limited to the U.S. investors but also to other markets' investors under study. For instance, the results of this study also signifying that it is feasible for Malaysian investors to have short term gain by investing internationally especially in China, India and Indonesia markets due to no causality effect from Malaysia market to those markets respectively.

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