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# Similarity of emerging market returns under changing market conditions: Markets in the ASEAN-4, Latin America, Middle East, and BRICs



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## ABSTRACT

We studied the risk-return distances of 18 emerging stock markets in the period from January 2000 to December 2013. Distances are linked to volatility and time-varying correlations estimated in standard and asymmetric DCC models. Our results revealed a positive relationship between risk-return distances and volatility, which means that during more volatile periods, the risk-return characteristics in emerging markets exhibit lower similarity to the characteristics found in developed markets. This result seems to be in sharp contrast to most empirical studies using correlations. Within the portfolio framework, our results suggest that diversification into emerging stock markets may still provide desirable benefits to international investors.

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## 1. Introduction

Several empirical studies reported decades ago that international diversification may provide a significant increase in the risk-return efficiency of investor's portfolios (inter alios, [Grubel, 1968](#); [Solnik, 1974](#)). The basic idea is that low correlations among asset returns decrease the overall risk of the entire portfolio, and thus, while equity markets are not fully integrated, they provide a favourable opportunity to diversify.

[Longin and Solnik \(1995\)](#) later reported a significant increase in the average stock market correlations between seven developed markets (France, Germany, Switzerland, UK, Japan, Canada and the US) during the period from 1960 to 1990. Since then the “free lunch” benefit kindly provided by international diversification has been challenged by many empirical researchers. While the mutual relationships between national markets may change over time due to increased interdependence or changing market conditions (e.g. volatility), it is beneficial to explore the evolution of correlations during some time periods.

For example, [Chelley-Steeley \(2004\)](#) computed the bivariate correlations for each month using the daily returns in the corresponding month. She used a sample of Asia-Pacific emerging markets (Korea, Taiwan, Thailand and Singapore) and developed markets (US, UK, Canada, France, Germany and Japan) between January 1990 and January 2002. A smooth transition logistic trend model was then fitted to the correlations to examine the speed and magnitude of stock market integration.<sup>1</sup> A similar methodology was utilised by [Lahrech and Sylwester \(2011\)](#), but in this case time-varying correlations were estimated in the standard dynamic conditional correlation (DCC) framework used by [Engle and Sheppard \(2001\)](#) and [Engle \(2002\)](#). The smooth transition model was then fitted to correlations among the US and Latin American stock markets in the period from December 1988 to March 2004. The results convincingly showed that co-movements between the national equity returns of the examined Latin American countries and those of the US increased over time, although the magnitude and speed varied across countries. Finally, [Durai and Bhaduri \(2011\)](#), using the same methodology on a sample of markets from the US, UK, Germany, India, Malaysia, Indonesia, Singapore, South Korea, Japan and Taiwan, also provided evidence of strengthening cross-market linkages in the period from July 1997 to August 2006. The relationship between changing market conditions and cross-market linkages was recently examined by [Baumöhl and Lyócsa \(2014\)](#) with a sample of 32 emerging and frontier markets for the period between January 2000 and December 2012. The results showed that the relationship between conditional volatility and time-varying correlations is significant and positive. Such findings suggest that the benefits of international diversification are weakened during more volatile periods, i.e., at times when investors need them the most.

We have mentioned just a few empirical works which discuss stock market co-movements, although the overall evidence favours strengthening stock market integration, which results in higher equity returns correlations. However, it is worth mentioning that higher correlations might not necessarily induce a higher degree of stock market integration. The so-called contagion effect explains that during more volatile periods (e.g. during crises), financial markets tend to move in a more concentrated manner. [Masson \(1999\)](#) proposed distinguishing macroeconomic linkages behind contagion into monsoonal effects (contagion driven by a common factor), spillovers (through macroeconomic linkages, e.g. foreign trade), and jumps between multiple equilibria (which are not caused by any fundamentals and are more likely to be stochastic). Perhaps most notably, the discussion about financial contagion expanded after the contribution by [Forbes and Rigobon \(2002\)](#), where contagion was defined as “a significant increase in cross-market linkages after a shock to one country (or group of countries)”. Alternatively, continued market dependence at high levels is considered to be “no contagion, only interdependence”.<sup>2</sup>

In addition to the correlation dynamics, which is only one of the inputs for the computation of an investment portfolio, [Eun and Lee \(2010\)](#) showed that risk-return characteristics may either converge or diverge when the correlation increases. They computed the risk-return distances among 14 emerging markets over the period from 1989 to 2007 based on the Euclidean distance and found that the distances had been decreasing significantly over time. As risk-return characteristics between markets give investors additional insight into market co-movements, knowing the time-varying

<sup>1</sup> For a discussion of the possible distortion of correlations obtained in this manner, see [Baumöhl \(2013\)](#).

<sup>2</sup> For a further discussion on definitions of contagion and mechanisms of crisis transmission, see [Dungey and Gajurel \(2014\)](#).

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