Review

The evolution of risk premium as a measure for intra-regional equity market integration

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ABSTRACT

We estimate and test the conditional version of an international capital asset pricing model using a parsimonious multivariate GARCH process and the multivariate nonlinear least squares method. Since our approaches are fully parametric, we can recover any quantity that is a function of the first two conditional moments. Our findings strongly support using a model that includes both regional market and foreign exchange risk. However, both sources of risk are detected only when their prices are allowed to change over time. Our empirical results show clear evidence of market integration to varying degrees, explained by the US term premium and the level of market openness. Though it reaches high values during turmoil periods and exhibits an upward trend toward the end of the estimation period, the Indonesian stock market remains partially integrated into the ASEAN-5 regional market. These results suggest that diversification into Indonesian market assets continues to produce substantial profits and that asset pricing rules should reflect a state of partial integration.

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1. Introduction

The Asian financial crisis has led regional governments to cooperate in several attempts at financial integration. For example, the 2000

Chiang Mai initiative involving the Association of Southeast Asian Nations (ASEAN) was an attempt to create a range of swaps arrangements that would allow member countries to protect themselves against speculative attacks when their fundamental positions were sustainable. Most of the swap arrangements enable a country under attack to obtain US dollars from the other countries as long as it is taking adequate countermeasures, such as an IMF-endorsed program. Though regional financial integration has not been driven by the solid sense of political

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purpose that has characterized its European counterpart, Asian countries have observed that European integration has been a source of regional strength and stability and have wondered what might be developed for their own benefit. Most of the interest in the financial field has focused on monetary integration, not simply because that is technically much easier to achieve than is financial integration but also because the Asian crises were primarily foreign exchange crises, which spilled over into banking crises, particularly in Indonesia. The focus of action has been on developing bond markets, particularly through the Chiang Mai initiative, which enables a network of currency swaps to be activated among the member countries. The consensus is that the Asian crisis occurred largely because countries had difficulty matching both currencies and maturities in the turbulent period; deeper bond markets might have been able to recover much more rapidly. The fact that a large share of corporate and bank liabilities were denominated in a foreign currency has been recognized as a major factor in the vulnerability of the financial systems of most Asian economies (Borensztein & Loungani, 2011). This crisis has shown that contagion effects can be important even when regional financial integration is limited. The fear of a new financial contagion has pushed countries to engage in a concerted effort to develop instruments for promoting greater financial stability in the face of external shocks. Our objective is to determine whether Indonesia could be a locus of financial stability in Asia.

The literature on this subject (Bekaert & Harvey, 1995; Carrieri, Errunza, & Hogan, 2007) shows that the expected returns of listed shares on emerging stock exchanges depend not only on the national economy's characteristics but also on the degree of the emerging markets' integration in global finance. Efficient allocation strategies in emerging countries like Indonesia require a careful analysis of their risk-return trade-off as well as their linkages with the global stock market. Interactions with the developed world make the Indonesian market's returns vulnerable to changes in other markets and may thus wipe out portfolio diversification benefits.

Although previous studies (Adler & Qi, 2003; Carrieri et al., 2007; Guesmi & Nguyen, 2011,) have provided a general understanding of the global integration of emerging markets in recent decades (Errunza & Losq, 1985; Bekaert & Harvey, 1995; Carrieri et al., 2007; Pukthuanthong & Roll, 2009), little attention has been paid to the intra-regional integration of emerging markets into regional markets, an undeniable trend. Moreover, the possibility that the structural reforms undertaken by emerging countries lead to time-varying shifts in the integration process governing stock market return dynamics has rarely been considered, producing a biased assessment of the degree of financial integration.

This study contributes to the literature by developing a dynamic international capital asset pricing model (ICAPM) that allows for smooth transitions between integration regimes: expected returns may move from a perfectly-segmented regime to a perfectly-integrated one, or vice versa, depending on the US term premium and the level of market openness. Although the proposed model was developed in the spirit of that offered in Bekaert and Harvey (1995), it allows for the dynamic conditional correlations between stock returns by using the multivariate GDC–GARCH model of Engle (2002). It also enables us to examine the relevance of the dynamic measure of financial integration over the conditional correlations, frequently used in the literature to describe integration levels. Our study differs from past studies in that we investigate the integration of emerging market regions into the ASEAN-5 region, rather than into the global market, using the real effective exchange (REER) as a common source of risk, in addition to regional and local sources.

Our findings clearly show that the degree of Indonesia's market integration varies over time, and that the US term premium and level of market openness serve as the chief explanations of that degree. Despite reaching high values during turmoil periods and exhibiting an upward trend toward the end of the estimation period, the Indonesian market remains partially integrated into the regional one.

Our analysis is relevant for both policymakers and investors interested in stock markets and their integration. Our examination of the links between stock markets is of particular interest to financial players; portfolio managers monitor stock market fluctuations to infer the trend of each market and make diversification decisions. Moreover, the degree of market integration is a crucial issue for the world economy during turmoil periods. Measuring the impact of financial crises on integration degrees also provides useful information about possible substitution strategies between stock classes. Specifically, integration levels are key to hedging possibilities, while they also impact asset allocation and their risk-return trade-offs.

The rest of this paper is organized as follows. Section 2 presents a brief review of the literature on financial integration in emerging markets. Section 3 describes our empirical approach to measuring and investigating levels of stock market integration over time. Section 4 presents the data. Section 5 discusses the study's results, and Section 6 provides some concluding remarks.

2. Literature on the integration of emerging markets

Discussing emerging stock markets requires that financial integration levels be considered. Relevant studies may be grouped into two main categories: those that test the perfect integration hypothesis of international capital markets, and those that test the hypothesis of partial integration. We will discuss only a few major papers among the extensive body of literature.

Harvey (1995) tests the international version of the Capital Asset Pricing Model (CAPM) model on 20 emerging markets. He concludes that the MSCI world index is not pertinent, given the low betas obtained, indicating that emerging markets are not fully integrated into the world market. This result remains unchanged after being adjusted for the effect of discontinuous trading.

The rejection of the perfect integration hypothesis naturally supports the idea that emerging markets are partially integrated, which can be tested using the methodology in Stehle (1977). The author proposed using a conditional ICAPM, in which the expected return on an asset depends on both the global systematic risk represented by the covariance between the asset and the world market portfolio and the local systematic risk represented by the covariance between the asset and the national market portfolio. In the absence of exchange rate risk, Stehle (1977) derives two alternative testable versions: a pricing model for an integrated state and a model for a segmented state. The first model requires that an asset's expected return be a function of the global systematic risk and the "adjusted" local systematic risk, corresponding to the uncorrelated portion between the national and world market portfolios. Under the null hypothesis of perfect integration, the local beta should be zero. The pricing model for segmented markets is constructed in a similar fashion, with the roles of the local and global systematic risks reversed.

Bekaert and Harvey (1995) agree with the partial integration view but deny the validity of static measures of market integration. Accordingly, they develop an alternative model combining the two extreme cases of perfect segmentation and integration; at each point in time, expected return on an asset (or a market) depends simultaneously on a global risk factor weighted by an integration coefficient and a local risk factor weighted by a segmentation coefficient. This model is reduced to a domestic CAPM for strictly segmented markets and to an international CAPM for perfectly-integrated markets. Bekaert and Harvey (1995) apply their nested model to 12 emerging markets and show that their integration level changes over time.

Adler and Qi (2003) examine Mexico's integration into the North American market from 1991 to 2002. The authors generalize the Bekaert and Harvey (1995) model to include the peso/dollar exchange rate risk and show that integration levels dropped during crises and began to rise again in the early 2000s. Additionally, the exchange rate risk was priced and relevant in explaining variations in the stock returns