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Stock market integration and risk premium: Empirical evidence for emerging economies of South Asia

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ABSTRACT

This article investigates the dynamics of regional financial integration and its determinants in an international setting. We test a conditional version of the International Capital Asset Pricing Model (ICAPM) accounting for the deviations from Purchasing Power Parity (PPP) as well as temporal variations in both regional and local sources of risk. Using data from five major South Asian markets (Malaysia, Thailand, Singapore, Indonesia, and Sri Lanka), our results support the validity of an ICAPM and indicate that the risk is regionally priced. Furthermore, we show that changes in the degree of regional stock market integration are explained principally by the U.S. term premium, and the level of market openness, whatever the measure of currency risk. Finally, and as expected, the degree of stock market integration varies considerably over time and from one market to another. As intense market integration induces both benefits and risks, our findings should have significant implications for economic policies and market regulations in emerging, frontier-emerging and transition countries, particularly for countries from the same region.

1. Introduction

While the empirical literature has shown the potential benefits of international diversification into stock markets, global investors often face both direct and indirect barriers (Bekaert and Harvey, 1995). Geographical distance between domestic and foreign markets is often an important barrier, limiting most cross-border investment opportunities. The heterogeneous characteristics (e.g., level of financial market development and trade openness) among the different economic regions also matter greatly. Financial integration is, first of all, the gradual elimination of direct and indirect barriers that impede free movement of goods, services and capital. These stylized facts have given rise to the establishment of several large geographical centers that offer very different risk-return profiles.

Grouping by major geographical clusters should lead to financial integration as well as to the validity of the law of one price under the impetus of trade and investment between countries in the same region. We would expect adjustments in the foreign exchange markets for this law to be applied. However, as far as international portfolio diversification in emerging countries is concerned, the hypothesis of unique price of risk across markets is usually violated insofar as exchange rate regimes are likely to be subject to more or less stringent regulations im-

posed by local authorities. Several studies have examined the dynamics of regional integration in emerging markets. Errunza and Losq (1985) introduce a pricing structure, called "mild segmentation", where access to the various asset classes is not the same for two types of investors: investors not subject to legal restrictions on holding assets have access to all securities while investors subject to reference restrictions are only able to conduct transactions on a subset of assets. Their empirical results show that emerging markets are neither strictly segmented nor perfectly integrated. In a different way, Claessens and Rhee (1994) apply Stehle's (1977) procedure to study the risk-return linkages in 16 emerging markets. Their empirical finding contradicts the hypothesis of integration in most of the markets, whereas the segmentation hypothesis cannot be rejected in any of the markets.

Phylaktis and Ravazzolo (2002) derive the covariances of excess returns on the stock markets for 1980 and 1998 using Asset Pricing Models. They establish expressions for the excess returns of the local and foreign stock markets as a function of the real interest rate, dividends paid, and other variables such as lagged returns and the exchange rates so as to find the determinants of returns in each country, and also to derive the variances and covariances of the excess returns; the idea is to find variables that help to explain movements in the stock markets of Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. They find that variations in dividends paid are a significant source of variance in stock returns. An interesting result that arises is that co-movements in output growth are directly related to stock prices. The paper unearths a close connection between Thailand and

the U.S., and a high degree of integration between Korea, Taiwan and Japan.

Adler and Qi (2003) extend the model of Bekaert and Harvey (1995) which basically combines the domestic and international versions of an Asset Pricing Model (ICAPM) to test the power of domestic factors, relative to that of common factors, to explain expected returns, and empirically infers segmentation when the weight of the domestic factors is high. So, Adler and Qi (2003) investigate the evolution of the process of integration between the Mexican and North American equity markets between 1991 and 2002. They show that the degree of market integration is higher at the end of the period than at the beginning, and that Mexico's currency risk is priced. Furthermore, there is significant asymmetric volatility, which is strongly related to the asymmetric volatility of the Mexican equity market return process.

Carrieri et al. (2007) extend the model of Errunza and Losq (1985). They study the integration levels of eight emerging markets over the period 1977–2000. They show that the local pricing factor continues to be relevant in the valuation of emerging-market assets, but none of the markets considered is completely segmented from the world market. Furthermore, Chambet and Gibson (2008) estimate a multifactor asset pricing model of partial integration, an extension of that of Errunza and Losq (1985) for 25 emerging markets, and show that some markets still remain segmented.

Guesmi and Nguyen (2011) inspired by the model of Bekaert and Harvey (1995) use a conditional version of an ICAPM to evaluate the dynamics of the global integration process of four emerging market regions (Latin America, Asia, Southeastern Europe, and the Middle East) into the world market. They show that the integration degree in the four emerging market regions varies widely through time over the period 1996–2008, and that this can be explained by the regional factors. Although the general trend is toward increasing financial integration, emerging market areas seem to be still significantly segmented from the global market.

Guesmi (2012) investigates the evolution of the South-East Asian stock market integration with the regional one, and deduces that with the exception of Singapore's market, emerging markets are not strongly integrated in the study area. These results were confirmed by those of Petri (1993), Frankel and Wei (1995), and Frankel and Romer (1999). They show that the geographical proximity effects are not significant in the Southeast Asian region.

More recently, Berger and Pozzi (2013) suggest a measure of financial integration based on the conditional variances of the country-specific and common international risk premiums in equity excess returns. The authors show that Germany, France, the U.K., the U.S., and Japan exhibit several shorter periods of disintegration over the period 1970–2011. They conclude that stock market integration is measured as a dynamic process that is fluctuating in the short run while gradually increasing in the long run.

In our work, we investigate the issue through a longitudinal study of the South Asian region using monthly data from 1996:01 to 2007:12. Our study differs from previous ones by considering intra-regional integration instead of global integration, and by taking into account the currency risk in addition to the sources of global and domestic risks. The international asset-pricing model we use is built so as to characterize the changes in market integration through time due to the impacts of the gradual removal of barriers to emerging market investments. We also examine the portions of the returns explained by regional and domestic risk factors, respectively, by carrying out a decomposition of the total risk premium.

The present study contributes to the literature by developing a regime-switching ICAPM with a slip condition. Specifically, expected return can slip from a perfectly segmented regime to a perfectly integrated one or vice versa depending on the number of national and regional factors that may influence the process of regional financial integration.

It is true that this model was inspired by that of Bekaert and Harvey (1995), but it has been extended using a multivariate GDC-GARCH

model to take into account the asymmetric responses of expected returns to different shocks.

One of the advantages of our approach is to authorize the prices of domestic and world market risks, betas and correlations to vary asymmetrically through time. It is clear that this will help us to understand the dynamics of interdependencies and correlations between South Asian stock markets in order to facilitate decision-making. In fact, investors are normally risk-averse, they are concerned about market downturns more than upturns. Consequently, this risk-aversion behavior will be reflected in market prices, resulting in greater market responses to downturns than upturns.

Asymmetry can be justified differently by the presence of information barriers, the behavioral standpoint of investor psychology (Verma and Verma, 2010), other sources of market segmentation (Bekaert and Harvey, 1995), heterogeneous transaction costs (Anderson, 1997), the coexistence of different shareholders, and noise trading (De Grauwe and Grimaldi, 2006). Also another source of asymmetry effects is industry concentration and imperfectly competitive behavior. It implies that wholesalers, or middlemen with power over price, may exercise pricing strategies that result in a slow and incomplete pass-through of increases in the international price and a fast and complete transmission of decreases in the international price to prices upstream.

Although asymmetric adjustment may also be the outcome of market imperfections, it is plausible that price support policies result in positive and negative changes in the international price affecting the domestic market in different ways. Moreover, the effect of positive shock and negative shock is different.

Our findings clearly show that the degree of market integration of the five emerging markets varies over the period 1996–2007. Moreover, the U.S. term premium and the level of market openness mainly explain the degree of integration in emerging markets. Even though this degree reaches high values during periods of turmoil, and exhibits an upward trend toward the end of the estimation period. Hence, emerging markets still remain substantially segmented from the regional market. Also, the total risk premium decomposition shows that the variance risk related to the local market index (the local risk factor), explains more than 70% of the total risk premium on average for the five emerging markets.

Tracking the integration level is a critical task. It is important to know if the emerging countries in the Asia region are globally or regionally integrated for most of the sample period. In fact, if there are regional integration, and if suddenly during an Asian crisis the intraregional correlations between the countries rise dramatically, this may lead to contagion effects.

Our analysis is relevant for both policymakers and investors that pay a particular attention to stock markets and their degree of integration. Also, analyzing the links between stock markets is of particular interest for financial players. Portfolio managers look at stock market fluctuations to infer the trend of each market, and make diversification decisions. Moreover, studying the degree of integration becomes a central issue for the world economy during turmoil periods. In fact, comparing the impact of the financial crisis on the degree of integration provides useful information about possible substitution strategies between stock classes. In particular, the integration level plays a key role regarding hedging possibilities, and impacts asset allocation, and their risk-return trade-off.

The remainder of the article is organized as follows: Section 2 presents the empirical methodology; Section 3 describes the data; Section 4 presents and discusses the results; and Section 5 draws the appropriate conclusions.

2. Empirical approach

Our empirical asset pricing model takes as its point of departure that of Bekaert and Harvey (1995), and is inspired by the theoretical models of partial integration of Black (1974), Stulz (1981), Cooper