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# Is there heterogeneity in financial integration dynamics? Evidence from country and industry emerging market equity indexes☆

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ABSTRACT

This paper examines the dynamics of the financial integration process across equity markets in one global emerging region (Emerging) and three emerging sub-regions (Asia, Eastern Europe, Latin America) over the last two decades. The proportion of total variation in individual excess returns explained by the first principal component serves as a robust measure of integration. Financial integration is measured in the "national equity market" (market) and in ten different "industrial equity markets" (basic materials, consumer goods, consumer services, financials, healthcare, industrials, oil and gas, telecommunications, technology and utilities). We obtain two main results. First, we observe that the level of integration across emerging equity markets in emerging regions is rather low, both at the country and industry level. Second, the shape of the financial integration process is not homogeneous among different industries. Specifically, J-shaped, U-shaped and increasing trends are observed. Overall, our integration numbers and dynamics simultaneously improve portfolio diversification benefits and reduce risk-sharing opportunities. This is supported by a CAPM-based analysis.



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## 1. Introduction

Global capital markets are becoming increasingly integrated. Investment and financing decisions by both institutional and private investors are influenced by the perceived degree of integration across international capital markets. Therefore, financial integration has received an enormous amount of attention in the literature, much of it devoted to examining its asset allocation implications.

It is popularly known that adding foreign financial assets into a domestic portfolio might allow investors to reduce the overall level of risk, as the domestic and foreign equity market returns tend to drift away from each other. This very simple concept has been discussed in early studies focusing on international portfolio diversification (see Grubel, 1968; Levy and Sarnat, 1970; Lessard, 1976, among many others). The general idea is that in presence of a low correlation between foreign and domestic equity market returns, an investor could smooth portfolio risk without reducing portfolio expected return by adding foreign stocks in her/his domestic portfolio. However, a relatively high degree of financial integration might produce a significantly drop in cross-border portfolio diversification benefits. This drop tends to be stronger in recession times (i.e. in periods in which international equity market returns are strongly correlated). For example, the last 2001 (post-dotcom crisis) and 2008 (sub-prime crisis) recessions were characterized by an unprecedented degree of international synchronization as all major industrialized countries experienced large contractions in equity market prices around the dates of 9/11 terrorist attacks and Lehman bankruptcy. Differently, equity market prices in some emerging countries as well as in specific emerging industries were less affected by these recessions. Most likely, these equity markets are less integrated than others and do not necessarily follow global price indexes (e.g. S&P 500. MSCI World). Therefore, international investors found emerging equity markets more profitable – in terms of risk-return performance – than advanced equity markets. Consequently, international investors re-balanced their portfolios by taking long positions on emerging stocks (see Fig. 1). Nevertheless, from a practical point of view, most of the investments in emerging market equity rely on shares in emerging aggregate regional indexes (e.g. Emerging, Africa, Asia, Eastern Europe, Middle East, Latin America, etc.),[1] which implicitly assume that price indexes belonging to the same region might follow similar paths as well as exhibit similar risk-return profiles. While these regional aggregate indexes are very liquid, they do not necessarily provide strong diversification benefits, especially during crisis-periods. This because some country equity indexes embodied in the global emerging aggregate equity index are strongly correlated with other global equity price indexes (e.g. G7 equity price index). However, country equity price indexes within a region might exhibit different patterns (i.e. different integration dynamics). Moreover, industries within a country might also display different dynamics. This might be due to the different ways in which financial shocks affect equity prices in different countries. We argue that the systemic banking crises of the late 1990s and early 2000s did not affect country and industry emerging equity price indexes homogeneously.

In this paper, we examine the evolution of the financial integration process in one global emerging region (Emerging) and three emerging sub-regions (Asia, Eastern Europe, Latin America). A dynamic principal component analysis (PCA) is carried out. Following Volosovych (2011, 2013), the percentage of variance explained by the first principal component serves as robust measure of integration, and thus, represents our integration index. Differently from existing studies, which focus exclusively on national equity markets, and thus, employ only aggregate equity indexes (i.e. country equity indexes), this study employs both country and industry equity indexes (see Fig. A.1). First, we employ country equity indexes (Market) to construct the dynamics of the financial integration process across "national equity markets". Second, following the level 2 classification of Datastream Global Equity Indexes (DGEI), we divide each country equity index in ten different industry equity indexes (basic materials, consumer goods, consumer services, financials, industrials, healthcare, oil and gas, telecommunications, technology, utilities). Thus, we measure integration in these ten "industrial equity markets". Overall, we analyze integration dynamics in 11 different markets.

The ultimate goal is to examine whether there is heterogeneity in the average level of integration as well as in the dynamics of the financial integration process among regions and industries. We stress that such heterogeneity might improve portfolio diversification benefits confirming that

[1] E.g. "iShares MSCI Emerging Markets", "LYXOR UCITS EFT MSCI EMERGING MARKETS".