



# The evolution of stock market integration in the post-liberalization period – A look at Latin America

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## Abstract

I use ADRs to examine if the equity markets of Argentina, Chile, and Mexico have become internationally integrated in the post-liberalization period and, if not, whether direct and/or indirect barriers are the cause of segmentation. In addition, I assess the evolution of the level of integration over time to determine if these markets are converging to or diverging from integration. I find that these markets have not become integrated. More revealing is that there is no secular trend towards greater integration. In fact, the Brazilian and Mexican currency crises temporarily increased the level of segmentation of Argentina and Chile, and appear to have had a more persistent effect on the level of integration of Mexico, as this market has become increasingly segmented in the post-crisis period. It appears that both direct and indirect barriers are responsible for the segmentation.

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## 1. Introduction

In the late 1980s, several developing economies liberalized their stock markets in order to precipitate their integration into the world capital market.<sup>1</sup> The process of reform was radically

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<sup>1</sup> “Full integration” represents the ideal towards which the emerging markets strive, but for practical purposes they may only achieve high levels of integration (Bekaert and Harvey, 2003). Where there is no ambiguity I simply use integrated to mean fully or highly integrated.

different from anything that had previously been attempted in these markets and held out the promise of the emerging markets reaping the substantial benefits of integration. The scale of these changes is reflected in a 1993 *LatinFinance* article that stated, Latin America “... has changed so much in the last three years ...” because “... since 1990, one country after another has chipped away at regulatory regimes that blocked or, at the very least, discouraged the easy inflow and outflow of capital.”<sup>2</sup>

Yet, a decade later there are doubts that liberalization has led to integration. For instance, *The Economist* reports that the American depositary receipt (ADR) of Taiwan semiconductor (TSMC) traded at a 70% premium relative to its underlying stocks, while an Indian high-tech ADR traded at a 150% premium, and Korean ADRs frequently traded at substantial premiums. The premium on ADRs, the article asserts, arises because these markets are not integrated into the world capital market.<sup>3</sup> If markets are perfectly integrated, then the ADR and its underlying stocks are perfect substitutes, and arbitrage opportunities between these securities cannot persist. However, if there exist investment barriers between the U.S. and emerging markets, then this arbitrage condition might not be immediately eliminated (see, e.g., Adler and Dumas, 1983), giving rise to persistent price differences.

Academic researchers have also questioned the success of liberalization. For example, Bekaert and Harvey (1995, p. 405) find that, in the first two to three years after liberalization, “... some countries (e.g., Chile and Mexico) are becoming less integrated into the world market ...,” and Bekaert and Harvey (2000, p. 601) find that liberalization “... reduces the cost of capital but perhaps by less than we expected.”

In this paper, I use ADRs to examine the level of integration of a sample of emerging markets in the post-liberalization period. Specifically, I answer the questions: Have these markets become integrated in the decade after liberalization? If not, are direct and/or indirect barriers the cause of segmentation?<sup>4</sup> In addition, I assess the evolution of the level of integration of these emerging markets over the post-liberalization period to determine if they are converging to or diverging from integration. I utilize the idea that in fully integrated markets investors are indifferent between the national markets to which they allocate funds because there is a common reward — price of risk — per unit of systematic risk exposure (see, e.g., Stulz, 1981; Harvey, 1991; Bekaert and Harvey, 1995). I test the null hypothesis that in the post-liberalization period the prices of risks for portfolios of Latin American ADRs and the U.S. market portfolio are equal.

To achieve the above, I use an asset-pricing model in which conditionally expected returns on portfolios of ADRs and the U.S. market are jointly modeled as a product of time-varying prices and quantities of equity and currency risks (see, e.g., De Santis and Gerard, 1998). Because the null hypothesis of integration is based on the equality of risk prices, the magnitude of the deviation from zero of the differences in risk prices indicates the changing level of integration over time, consistent with the time-varying integration of Bekaert and Harvey

<sup>2</sup> See, Special Supplement: 1993 Latin Securities Law, *LatinFinance*, 48, July/August 1993, pp. 2, 24. The main reforms include large-scale privatization, allowing foreign investors access to domestic capital markets, granting foreign and local investors equal status under the law, and removing restrictions on capital repatriation.

<sup>3</sup> *The Economist*, ‘Finance and Economics: Over the Odds’, 01/15/00, pp. 77–78.

<sup>4</sup> Direct barriers are government-imposed restrictions limiting foreign investor participation in the domestic market. Examples are restrictions on foreign ownership of local securities, differential or withholding taxes on foreign investors, or a minimum investment holding period. In contrast, indirect barriers are not government-imposed. The most significant indirect barrier is higher monitoring cost due to lack of information on the foreign markets because of weak foreign disclosure requirements. Others include nonsynchronous business hours and differences in language.

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