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Intra and inter-regional causal linkages of emerging stock markets: evidence from Asia and Latin America in and out of crises

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Abstract

This study examines the causal linkages among several emerging stock markets in Asia and Latin America since 1990. These markets experienced both rapid growth and major upheaval during the sample period, and thus, provide potentially rich information on the nature of cross-market interactions. Using daily observations of stock indices and the GARCH family of econometric models, we conduct the residual cross-correlation function tests to investigate cross-market causality both in the first and second moments of the stock returns. The empirical results reveal significant causal linkages both within each region and across the two regions. Further, our rolling test results indicate that the significance of the causality varies considerably over time. Importantly, we find that the causal linkages tend to strengthen particularly at the time of major financial crises. The empirical results also point to some imperative issues including inter-regional asymmetry in the causality and persistence of shocks on market linkages.
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1. Introduction

A series of financial crises in the past decade have generated a heated policy debate over desirability of swift financial liberalization for emerging markets (Furman and Stiglitz, 1998; Radelet and Sachs, 1998). Among the cornerstone issues is "contagion" of financial crises across countries. If the sequence of financial turmoil in numerous countries is a result of systematic deterioration of their own fundamentals, then it is primarily their domestic macroeconomic policy conducts, rather than the financial liberalization, that needs to be addressed. On the other hand, if the emerging economies are inherently vulnerable to negative effects of financial instability occurring elsewhere, then it may well be justified to actively tame some of the financial flow into and/or out of the markets. The crucial issue has motivated numerous recent studies (Baig and Goldfajn, 1999; Edwards and Susmel, 2001; Forbes and Rigobon, 2002) to empirically examine whether or not the cross-country interactions of financial markets during crises periods are significantly different from those in stable times. Some studies (Baig and Goldfajn, 1999; Calvo and Reinhart, 1996) find that financial market correlations across countries increase significantly during crises, rendering support to the view that crises are contagious. Forbes and Rigobon (2002), however, casts a serious doubt on the contagion hypothesis by demonstrating that the previous empirical evidence based on market correlations are prone to a bias resulting from neglecting heteroskedasticity in the financial time series. Since the accumulated evidence has yet to reach a definitive conclusion, gaining further insight into the issue is warranted.

In this study, we investigate the causal linkages among the stock markets of several emerging economies in Asia and Latin America since 1990. These markets have experienced both rapid growth and major upheaval over the past decade, and thus, provide potentially rich information on the nature of the cross-market interactions in altering market environments.[1] In particular, we are interested in finding out if inter-market relationships, both within and across the regions, vary significantly as the markets go into and out of financial crises. Using daily observations of stock indices of several Asian and Latin American markets and the generalized autoregressive conditional heteroskedasticity (GARCH) family of econometric models, this study conducts the residual cross-correlation function (CCF) tests (Cheung and Ng, 1996) to investigate cross-market causality both in the first and second moments of stock returns within and across the regions. By implementing the CCF tests with a rolling window, we illustrate how the significance of the inter-market causal linkages has evolved over the past decade as the markets experienced periods of stability and volatility.

Our empirical exercise has several desirable features. First, by modeling the stock return dynamics as autoregressive (AR) processes with the GARCH feature, we explicitly account for conditional volatility present in the time series data. The CCF tests are conducted on the (squared) *standardized* residuals obtained from the estimated AR-GARCH

[1] Our sample period contains numerous incidents of currency and/or banking crises. They include the currency crises in Argentina and Brazil in 1990–91, the twin crises in Mexico and the subsequent disorder in Brazil and Argentina in 1994–95, the 1997–98 Asian crises, and the Brazilian currency crises in 1999. For a summary and chronology of these and other crises incidents, see Goldstein et al. (2000).

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