Global Finance Journal 19 (2009) 203–218

Contents lists available at ScienceDirect

Global Finance Journal

journal homepage: www.elsevier.com/locate/gfj

Return, volatility spillovers and dynamic correlation in the BRIC equity markets: An analysis using a bivariate EGARCH framework

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ARTICLE INFO

Article history:
Received 14 July 2008
Accepted 6 September 2008
Available online 15 October 2008

JEL classification:
E37
G15

Keywords:
Volatility spillover
Dynamic correlation
BRIC
Market integration

ABSTRACT

This paper examines the level of integration and the dynamic relationship between the BRIC countries, their respective regions and the world. We find that India shows the highest level of regional and global integration among the BRIC countries, followed by Brazil and Russia and lastly by China. There is a negative relationship between the location conditional volatility of India with that of the Asia-Pacific region and of China with the world, which indicates a presence of diversification opportunities for portfolio investors. Portfolio investors can continue to receive sound returns from taking positions in the index of these countries, however for an outstanding investment performance, they should consider investing in specific areas of growth within the economy rather than the country index.

1. Introduction

The topics of financial liberalization and market integration have received great attention in the financial literature, especially after the financial market crisis in 1997–1998. Experiences to date confirm that while openness of financial markets contributes to economic development it also makes developing countries more vulnerable to financial disruptions (Kaminsky and Schmukler, 2001, in press; Levine and Schmukler, 2003). The increased awareness of the risks associated with financial market openness has however not discouraged the process of financial liberalization of developing countries. On the contrary, the experiences are used to broaden the knowledge and understanding of the process and have resulted in great learnings from past mistakes. Amongst others, Ito (2006) has studied the process of financial

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doi:10.1016/j.gfj.2008.09.005

liberalization of 87 less developed Asian countries and concluded that to benefit from more open cross-border financial transactions, financial systems need to be equipped with reasonable legal and institutional infrastructure. It is only under these circumstances that financial liberalization can be translated into financial growth. To add further to the argument of the growing initiative towards greater liberalization and integration of developing economies, there is a record of more than 50 regional and world, both trade and non-trade, agreements concluded after 2000 or currently being negotiated by non-OECD countries (Antkiewitcz and Whalley, 2006).

Wilson and Purushothaman of Goldman and Sachs Investment Bank produced a research paper in 2003 which has attracted the attention of many academic and industry professionals. In their paper called "Dreaming with the BRICs: the Path to 2050" they identify Brazil, Russia, India and China ("BRIC") as the new economic growth force in the world. This forecast is subject to the BRICs maintaining policies and developing institutions that are supportive of growth. They can develop to their potential only in the presence of a regulatory environment that supports the openness to foreign investments and enables and supports free flow of capital. Now that the potential of these countries has been unveiled and BRIC has become a common terminology amongst the finance professionals, the weight of the BRICs in investment portfolios is expected to rise sharply. Therefore it is very important to understand the nature of these markets and the way their equity market returns and volatility of returns relate and respond to regional and global financial events, and vice versa.

All four of the BRIC countries have gone through the process of financial liberalisation in the early 1990s. Bekaert, Harvey and Lundblad (2003) define the official equity liberalization of countries as "the date of formal regulatory change after which foreign investors officially have the opportunity to invest in domestic equity securities and domestic investors have the right to transact in foreign equity securities abroad". Based on this definition, Bekaert, Harvey and Lumsdaine (2002) identify the official liberalization dates for the BRIC countries as May 1991 for Brazil, January 1994 for Russia, February 1992 for India and July 1993 for China. If the liberalization is effective it is presumed to lead to market integration, which would in turn have an effect on both the financial sector and the real sectors of developing countries.

Theory suggests that expected returns of emerging markets should reduce following integration of the emerging market with the world economy (Bekaert et al., 2002). De Jong and De Roon (2005) found in their study of time varying market integration and expected returns in 30 emerging markets from Latin America, Asia, the Far East, Europe, the Mid-East and Africa, that the average annual decrease in local and regional segmentation of 0.055, on a [0, 1] scale, induce a decrease in returns of about 4.5% per year for these countries. The ultimate implication of the process of integration therefore is that portfolio managers would no longer be able to add significant value by pursuing indexing strategies in emerging markets. Stock selection strategies are imperative, if benchmarks are to be outperformed.

The purpose of this paper is to explore the level of integration of the BRICs with their respective regions and the world by using the bivariate EGARCH structure, which allows for time varying conditional correlation of index equity returns from these markets. The significance and behaviour of return and volatility spillovers from these countries to their respective regions and the world, and vice versa, are used as proxies for the level of integration of these markets regionally and globally. The dynamic conditional correlation aspect of the model also allows us to observe the impact of a number of significant events in the BRIC markets on the correlation of equity index returns in these markets with their respective regions and the world.

Using our weekly data set for the BRICs, their respective regions and the world over the period January 1995 to October 2006, we find that India shows the highest level of integration on a regional and world level amongst the BRIC countries, followed by Brazil and Russia and lastly by China. There is a negative relationship between the conditional volatility of India with that of the Asia-Pacific region, which, can be attributed to the low level of impact of the Asian crisis on India. Given the relatively closed nature of the financial system in China, there is no evidence of regional integration for China, only a negative relationship with the conditional volatility of the world market returns, which indicates a presence of diversification opportunities for portfolio investors. None of the BRIC countries impacts the equity price creation process in their respective regions, none of them have a significant impact over the conditional volatility of world market returns and only Russia has effect over the price creation process of world equity index prices.

The equity market index returns conditional correlation for Brazil with the region and the world projects very similar trends for the observed time period, with an evidence of a slightly higher level of world conditional correlation. Both Russia and India have relatively stable level of conditional correlation with the world, while the regional conditional correlation is very volatile. Unlike the other BRIC countries, the results for the Chinese