STOCK MARKET INTEGRATION AND PORTFOLIO DIVERSIFICATION IN THE BRIC COUNTRIES

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STOCK MARKETS INTEGRATION AND PORTFOLIO DIVERSIFICATION IN THE BRIC COUNTRIES

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A dissertation submitted in partial fulfillment of the requirements for the degree of Corporate Master in Business Administration

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I certified that I have supervised and read this study and in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality as a research paper for the degree of Corporate Master in Business Administration.

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STATEMENT OF ORIGINALITY

The work described in this Research Paper, entitled

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is to the best of the author's knowledge that of the author except

where due reference is made.

04 SEP 2012
Date

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ABSTRACT

STOCK MARKETS INTEGRATION AND PORTFOLIO DIVERSIFICATION IN THE BRIC COUNTRIES

By

WONG KAI HUNG

(This study examines the stock market integration and portfolio diversification in the BRICs (Brazil, Russia, India and China) before and after the US subprime mortgage crisis in 2008. The monthly stock market closing indexes from May 2003 to June 2011 have been adopted and further sub-divided into pre-crisis and post-crisis periods.) The results reveal that increase of stock market integration in BRICs after the subprime crisis. The evidence also found that China stock market is the most influential among the BRICs, in which the China stock market has the ability to Granger cause the other three BRICs member countries. Policy implication for investor on portfolio diversification shall be considered.)
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CHAPTER I
INTRODUCTION

1.0 Introduction

Financial market is a mechanism that allows people to trade the financial securities, commodities and other fungible items that to facilitate in raising of capital in capital market, transferring of risk in derivatives and money markets, and international trade in the currency market. Throughout the past few decades, the financial markets have grown rapidly in most of the developing countries due to globalization, deregulation, and advancement in technology. The change of regulatory on international capital flows has resulting in increased of capital mobility and more integrated of financial market all over the world.

In Finance, market are said to be integrated when the identical risk of an asset in different countries lead to similar level of expected return. Market integration refers to a situation where there are no impediments such as legal restrictions, transaction cost, taxes and tariffs against the trade in foreign assets or the mobility of portfolio equity flows (Marashdeh & Shrestha, 2010, pp.102). Equity market, also known as stock market, is vital in financial economy because it provides a channel for investors to access in capital and ownership of a company with potential return based on its future performance. Hence, the development of stock markets could enhance the degree of market integration.
Integration of stock markets has brought an awareness to both policy-makers and finance specialists. It is vital for several reasons. First, it provides opportunities in risk sharing among the integrated market (Marashdeh & Shrestha, 2010). Second, it reduces the cost of capital and price volatility (Tai, 2007). Third, it contributes to financial stability by enhancing competition and efficiency in allocation of resources (Trichet, 2005). Fourth, it encourages innovation and cost effective intermediation to improve access of financial services (Giannetti et al., 2002). Fifth, it fosters country’s financial sector to emerge as a regional financial centre (Reddy, 2003). Sixth, it promotes domestic savings, investment and could positively affect total factor productivity and economic growth (Levine, 2001). Hence, the analysis of the nature of integration of emerging markets would not only give an idea of possible gains to be reaped out of portfolio diversification but may also provide some indications of the vulnerability of the country’s equity market in case of regional financial crisis and consequent reversal of capital flows from the region (Chittedi, 2009, pp.19).

Generally, there are two core benefits of portfolio diversification. For example gain in expected returns and risk reduction. The impact of financial market integration is important, given that a portfolio’s exposure to systematic risk can be reduced through international diversification. The international portfolio diversification will be benefited if foreign securities do not perfectly correlated. It is well established that greater diversification benefits exist when the markets are less correlated. However, the concept of integrated market has strong consequences for international investors as it implies that the benefits of international portfolio diversification would disappear (Lee et al., 2009).
Therefore, it is important to study the integration of stock market as it could affect the investors’ decision in portfolio diversification especially in emerging market. In order to better understand the emerging stock market integration dynamics, the study focuses on BRIC (Brazil, Russia, India and China) countries as it is the world’s fastest growing emerging market which plays an increasing important role in the global economic development in 2010s. As at 20 February 2011, the Richest People reported the following statement:

"By 2020 there will be a major shift in the global balance of economic power compared to 2010. Emerging economies will rise in importance and China will have overtaken the USA to lead the list of the world’s top ten largest economies by Gross Domestic Product (GDP) measured in purchasing power parity (PPP) terms. Consumer markets in emerging economies will present enormous opportunities but their rapid growth poses a challenge to the global environment. Early this year, Japan confirmed that China’s economy surpassed its own and the world’s second largest in 2010”.

The top ten world’s ranking by according to PPP GDP is as below:

1 - United States  
6 - Russia
2 - China  
7 - United Kingdom
3 - Japan  
8 - Brazil
4 - India  
9 - France
5 - Germany  
10 - Italy
1.1 BRIC Countries Background

The BRIC countries, established since 2003, are dominating the emerging market economies in 21st century. Due to its demographic and economic development, the BRIC countries are rank among the world largest and most influential economies. The emerging market economy plays an increasingly important role in global economic development as well as monetary and financial systems. After the financial crises in Asia and Russia in 1998, Turkey and Brazil in 1999, and Argentina in 2001, the financial potential and economic development of the emerging markets especially the BRIC countries were focused sharply by the investor (Jensen & Larsen, 2004).

Table 1.1: BRIC Countries - Economy and Income, 2010

<table>
<thead>
<tr>
<th>BRIC</th>
<th>GDP</th>
<th>GDP, PPP</th>
<th>Market capitalisation</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(USD billion)</td>
<td>per cent of world</td>
<td>(USD billion)</td>
<td>per cent of world</td>
</tr>
<tr>
<td>Brazil</td>
<td>2,088 3.3%</td>
<td>2,185 2.9%</td>
<td>1,546 2.8%</td>
<td>195 2.9%</td>
</tr>
<tr>
<td>Russia</td>
<td>1,480 2.3%</td>
<td>2,812 3.7%</td>
<td>1,005 1.8%</td>
<td>142 2.1%</td>
</tr>
<tr>
<td>India</td>
<td>1,727 2.7%</td>
<td>4,195 5.5%</td>
<td>1,616 2.9%</td>
<td>1,171 17.1%</td>
</tr>
<tr>
<td>China</td>
<td>5,927 9.4%</td>
<td>10,170 13.3%</td>
<td>4,763 8.5%</td>
<td>1,338 19.6%</td>
</tr>
<tr>
<td>BRIC total</td>
<td>11,222 17.8%</td>
<td>19,362 25.3%</td>
<td>8,930 15.9%</td>
<td>2,846 41.6%</td>
</tr>
</tbody>
</table>

Source: WDI database, World Bank.

The development of BRIC countries stock markets are significant in relative to the world economy. By referring to the Table 1.1, the BRICs total population comprised more than 2.8 billion people which over 40% of the world's population. Among the BRICs, China and India stood about 20% and 17% respectively. The significant grew in population could lead to the development of BRIC countries economy and directly influenced the GDP and purchasing power parity (PPP). As a result, the GDP of the BRICs had
accounted for nearly 18% of the world and its GDP, PPP had stood up to 25% globally. From there, China had contributed 9.4% and 13.3% respectively. Due to high population and economy performance, the total market capitalization of the BRICs had achieved about 16% of the world. Among the BRICs, China took up the largest portion which was 8.5% of the world total market capitalization. As at 31 December 2010, China consisted of 2,062 listed companies which ranked the world second largest by market capitalization of stocks.

Figure 1.1: BRIC Countries Economic Growth, 2000 - 2010

Source: WDI database, World Bank.

In the last decade, the BRIC countries achieved a higher economic growth rate as compared to the world, see Figure 1.1. Before the U.S. financial crisis erupted in 2008,

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2 The U.S. subprime mortgage crisis occurred since August 2007 due to rise of interest rate and house bubble, and this tragedy spread to the world in September 2008.
the BRIC countries achieved a positive high growth rate from 5% to 14%. Due to this, many international investors have diversifying their portfolio in the emerging market especially the BRIC countries. Table 1.2 reported that the foreign direct investment (FDI) inflow of BRICs was increased significantly by 337% from US$77.5 billion in 2000 to US$338.6 billion in 2008. Even though the FDI inflow of BRICs was dropped during the subprime crisis periods but due to its strong economic, it had recovered subsequently in 2010. This indicated that more and more investors realized the importance of BRICs emerging market in the world perspective and have a confidence in the BRICs market’s potentiality. Therefore, it is worth to study the market integration among the BRIC countries in order to determine the international portfolio diversification direction.

Table 1.2: BRICs Foreign Direct Investment Inflow, 2000 - 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Brazil (US$ Million)</th>
<th>Russia (US$ Million)</th>
<th>India (US$ Million)</th>
<th>China (US$ Million)</th>
<th>Total (US$ Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>32,779</td>
<td>2,714</td>
<td>3,584</td>
<td>38,399</td>
<td>77,476</td>
</tr>
<tr>
<td>2001</td>
<td>22,459</td>
<td>2,748</td>
<td>5,472</td>
<td>44,241</td>
<td>74,918</td>
</tr>
<tr>
<td>2002</td>
<td>16,590</td>
<td>3,461</td>
<td>5,626</td>
<td>49,308</td>
<td>74,985</td>
</tr>
<tr>
<td>2003</td>
<td>10,144</td>
<td>7,958</td>
<td>4,323</td>
<td>47,077</td>
<td>69,502</td>
</tr>
<tr>
<td>2004</td>
<td>18,166</td>
<td>15,444</td>
<td>5,771</td>
<td>54,936</td>
<td>94,317</td>
</tr>
<tr>
<td>2005</td>
<td>15,066</td>
<td>12,686</td>
<td>7,606</td>
<td>117,208</td>
<td>152,266</td>
</tr>
<tr>
<td>2006</td>
<td>18,782</td>
<td>29,701</td>
<td>20,336</td>
<td>124,082</td>
<td>192,901</td>
</tr>
<tr>
<td>2007</td>
<td>34,585</td>
<td>55,073</td>
<td>25,483</td>
<td>160,052</td>
<td>275,193</td>
</tr>
<tr>
<td>2008</td>
<td>45,058</td>
<td>75,002</td>
<td>43,406</td>
<td>175,148</td>
<td>338,614</td>
</tr>
<tr>
<td>2009</td>
<td>25,949</td>
<td>36,500</td>
<td>35,596</td>
<td>114,215</td>
<td>212,260</td>
</tr>
<tr>
<td>2010</td>
<td>48,438</td>
<td>42,868</td>
<td>24,159</td>
<td>185,081</td>
<td>300,546</td>
</tr>
</tbody>
</table>

Source: Databank, World Bank.
1.2 BRICs Stock Market Development

The growth of stock market in BRICs has brought up an interest to the policymakers by expanding the financing options availability. Levine and Zervos (1995) argued that the stock market can give a big boost to economic development. According to World Bank (2010), several benefits can be associated with the development of the equity market:

- Investment in stocks is a form of long-term saving that is invested directly in production activity.
- Developed markets reward investors by returns maximization and the efficient use of resources, which are the seeds to begin a cycle of development and competitiveness.
- Developed markets with liquidity, volume and regulation stimulate businesses at a firm-level.
- Shareholder activity reflects the expectations of the main market players, as well as their opinions about both domestic and international states of economic affairs.
- An efficient stock market has a fundamental role in attracting, maximizing, consolidating and retaining external capital.

The stock market development of the BRIC countries will be presented in the following section and four main stock indexes namely Brazil BOVESPA Index, Russia Moscow Times Index, India Bombay SE 100 Index, and China Shanghai Composite Index are adopted as a benchmark in analyzing the market performance.
1.2.1 Brazil Stock Market Development

The Brazil stock exchange was founded in 1890 that known as São Paulo Stock Exchange (BOVESPA). The Brazil's national financial system and stock market was implemented in 1960s to develop and calculate several indexes measuring the behavior of stock market. In 1990, BOVESPA started to trade by using the computer system which operates simultaneously with the open outcry trading floor. In 2000, BOVESPA turned to be the only stock exchange in Brazil and was became a profit center company after the Brazilian capital market had been restructured.

In 2008, BM&FBOVESPA was formed by merging of São Paulo Stock Exchange (BOVESPA) and Brazilian Mercantile and Futures Exchange (BM&F). Its benchmark stock index is known as BOVESPA Index which was made up of the market most liquid stock that based on total returns weighted by their trading volume on the BOVESPA stock exchange. About 373 Brazilian companies were listed, with a market capitalization of US$1.22 trillion as of 31 December 2011. It ranked the largest stock exchange in Latin American in 2010⁴ and the fourth largest stock exchange in the world in 2011⁵.

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² The major description in this section is adopted from Brazil BM&FBOVESPA.
³ Reported by Forbes dated 13 December 2010.
⁴ Documented by Global Finance (March, 2011).
Figure 1.2 displays the monthly historical Brazil BOVESPA Index movement from 1993 to 2011. Before the recognition of BRICs region, the index was less volatile and moved not higher than 20,000 points for the past decade. The highest point recorded was in March 2000 at 17,820 but dropped again to less than 10,000 in July 2002. After BRICs region was formed in 2003 as an emerging market, the BOVESPA Index increased sharply by reaching a historical high of 73,516 point in May 2008 before the subprime mortgage crisis occurred.

Due to the effect of subprime mortgage crisis tragedy, the BOVESPA Index was declined by more than 50% to only 29,435 points in just six months period from May to November 2008. However, the stock market recovered again and escalated to the peak of 70,673 points in October 2010. In spite of the European sovereign debt concerns in early 2010 and uncertainty about the impact of inflation on the emerging economies’ growth in
the latter part of the year, the BOVESPA Index fell again since October 2010 by 20% to 56,754 points as at 31 December 2011.

1.2.2 Russia Stock Market Development

The Russian first regulated stock market after the dissolution of Soviet Union in 1991 was established in 1995 which known as Russian Trading System (RTS) Stock Exchange. RTS Stock Exchange is trading the full range of financial instruments from cash equities to commodity futures and become Russian securities industry benchmark. Subsequently, the Moscow Stock Exchange (MSE) was introduced to create and develop the equities market through a single trading system in 1997. The MSE's core activity is to develop the commodity market infrastructure as well as constantly improves its trading systems by looking for new opportunities to enhance its products and services.

As of 19 December 2011, RTS merged with Moscow Interbank Currency Exchange (MICEX). MICEX was established in 1992 and acts as a main stock exchange in Russia as well as in East Europe and ranked in top 20 of world's top stock exchange in 2011. The main function of MICEX during the time when it was created was to carry out currency transactions. As a result, the merger of two largest stock exchanges in Moscow is tending to become a main universal stock exchange entity for trading all classes of financial assets and to advance Moscow into an international financial centre as well as

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6 The major background contents are adopted from Russian Trading System Stock Exchange and Moscow Stock Exchange.
7 The statistic was abstracted from The MICEX Group Profile.
further market will be reformed in 2012 including the creation of a single depository. As of 31 December 2011, the total market capitalization of Russia was about US$1 trillion.

**Figure 1.3: Monthly Russia Moscow Timex Index, 1995-2011**

![Index movement graph](image)

Source: DataStream.

Figure 1.3 shows the monthly data movement of Russia Moscow Times (RMT) Index between 1995 and 2011. Prior to the recognition of BRICs, the RMT Index was moved gradually upwards but in slower pace. The highest point hit was in April 2003 which at 5,195. This was mainly due to Russian debt crisis in 1998 which led to the devaluation of ruble and default of debts. This crisis affected an inflow of foreign direct investment (FDI) to the country. According to the World Bank’s statistic, the average net inflow of FDI between 1995 and 2002 was only US$3.1 billion per annum. After the recognition of BRICs in 2003, the Russian FDI net inflow increased significantly to an average of

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8 Reported by Reuters dated 19 December 2011.
9 It is the currency unit of Russia.
US$32.7 billion per annum between 2003 and 2008. This encouragement had bulled up
the RMT Index by 287% from 5,505 points in May 2003 to 21,304 points in April 2006
and further up to historical high of 25,887 points before the subprime mortgage crisis
happened in May 2008. The index movement has similar trend with Brazil BOVESPA
Index.

Due to the subprime crisis in 2008, the stock market in Russia had been affected
tragically which resulted RMT Index dropped significantly to less than 8,000 points in
just 6 months period. By that time, Russia had registered a negative GDP growth of 8%
and the net inflow of Russian FDI was dropped from US$75 billion in 2008 to only
US$36 billion in 2009. However, due to its strong positive reserves and current account
balances, the Russian economy had been recovered rapidly in 2009. During the time of
subprime crisis in 2008-2009, Russia still maintained US$439 billion of total reserves
(includes gold) and US$49 billion current account balances. Therefore, the RMT Index
sooner retrieved from 7,966 point in December 2008 to as high as 21,056 points as of 31
July 2011.

1.2.3 India Stock Market Development

The Bombay Stock Exchange (BSE), established in 1875, is the oldest stock exchange in
Asia. It was the first stock exchange recognized by the Indian Government in 1956. In
1986, BSE developed the BSE SENSEX (Sensitivity Index) or BSE 30 to measure the
overall index of the stock exchange in India stock market. In 1989, BSE National Index

10 The empirical statistic reported by World Bank.
11 The major description of this section is referred to India Bombay Stock Exchange.
12 BSE 30 is free float market capitalization weighted stock market index of 30 largest stocks in 12 sectors.