

Do the Exchange rate impacts the cross country stock market return movements: Evidence from BRIC

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Abstract

In this paper, we attempt to find the impacts of cross-country Exchange rate price changes affect the equity markets in Brazil, Russia, India and China countries. We employed Impulse response function (IRF) method on Exchange rate and the stock market prices of BRIC. The results showed that the stock market returns are not responsive to the changes in cross-country macroeconomic factors except some cases. The study will be useful for policymakers, market investors and fund managers. Moreover, this study has the limitation of not including other countries and variables which may give the relationship this study tried to examine.

Keywords - Consumer Price Index, Impulse response function, Cross-country, Macroeconomics, Stock Market.

INTRODUCTION

Stock market is one of the channels of investment. Post globalization every stock market is very vibrant and attracting more investors from both domestic and global. Moreover stock market is one of the indicators of a country's economic performance. Due to the economic integration and openness, stock market is influenced by several external factors that include macroeconomic variables. Financial markets play a vital role in the underpinning of a stable and efficient financial system of overall economy. There are number of factors affect the performance of the stock market directly or indirectly.

According to the IMF, the aggregate GDP of the BRICS members is \$32.5 trillion whereas; the G7 group possesses \$34.7 trillion. From this, we can figure out that BRICS countries group show higher development rates than the G7 countries group. From this, we can assume that the pooled GDP of the BRICS countries will surpass the G7's aggregate GDP in the next two or three years. The BRICs are better placed to recover than their richer peers. Generally speaking, better control of inflation, increasing productivity, lower deficits, richer social programs and greater political stability have given the emerging giants greater room for error at a time when the macro-economic environment in rich countries has been deteriorating. Even Brazil and hard-hit Russia have used raw-materials windfalls (oil and gas for Russia, soybeans and iron ore for Brazil) to build a buffer for the downturn—Russia has spent more than \$300 billion defending the ruble, and still has that much in reserve. Brazil's \$208 billion reserve remains almost untouched.

In July 2014, Brazil, Russia, India, China and South Africa agreed a \$100 billion BRICS New Development Bank intended to rival the IMF and World Bank and sponsor business projects of the group. Russia expects to launch the bank as well as a currency reserve pool worth another \$100 billion. But, the differences between China and India could play the spoiler in BRICS. U.S.A, China, India, Japan, Russia, Germany and Brazil as a pooled group contribute 53% of the globe's total GDP. The world's top 3 military superpowers would be represented if the group is formed. Investigators have researched the patterns of equity markets movement of the developed markets to understand the behavior. But, very limited studies are available to learn the cross-country effects of macroeconomic factors on the stock market fluctuations. Some studied in Latin American region US, Mexico, Argentina and Brazil (Veruma et al, (2005), Ratner and Leal, (1996) Bailey et al) where some concentrated cross country relation between two countries.

Many studies have represented the relationship between stock returns and countries economic activities in countries like US, UK and American regions in terms of Gross domestic product, dividend yields, interest rate, inflation, production rates and as well as other macroeconomic variables (Fama 1970; Chen et al. 1986). Bilson et al. (2001) studied the impact of macroeconomic factors of an emerging country on stock fluctuations. Their studies

found that exchange rates, Goods prices, Interest rate and money supply are significant with their equity returns. So, we are considering exchange rate for investigating the cross country effect.

Our study attempt to analyze the whether the changes in exchange rate have impacts on the equity markets Brazil, China, India and Russia in cross-country basis. Moreover, it aims to check the cross-country economic effects on BRIC countries stock returns.

Literature Review

Bilson, Brailsford & Hooper (2001) addressed the question of whether local macroeconomic variables have explanatory power over stock returns in emerging markets, incorporating six Latin American countries, eight Asian countries, three European countries, one Middle Eastern country and two African countries, using correlation and regression. Monthly data from January 1985 to December 1997 was used for the study. Macroeconomic variables used were money supply (M1), consumer price index, industrial production index and exchange rate. The results show that while emerging stock markets are segmented to a degree, there is significant commonality in return variation across markets. Furthermore, little evidence of common sensitivities to the extracted factors was found when the markets are considered in aggregate, but common sensitivity is found at the regional level.

Pretorius (2002) used cross-section and time-series models to determine the fundamental factors that influence the correlation and evolution of the correlation between emerging stock markets, using Ordinary Least Square (OLS) methodology. Quarterly data from 1995:Q1 to 2000:Q2 was considered for the study. Ten emerging stock markets (according to the Emerging Market Database definition) with the highest market capitalization was used in the study. Variables used were, inflation, exchange rate, trade and industrial production. The results showed that only the extent of bilateral trade and the industrial production growth differential were significant in explaining the correlation between the two countries on a cross-sectional basis. In addition, countries in the same region are more correlated than countries in different regions.

Rahul Verma, Teofilo Ozuna (2005) examined the response of Latin American stock markets to movements in cross country Latin American macroeconomic variables. They find little evidence that Latin American stock markets are responsive to these changes. Alternatively, they find that Mexico's stock market affects other Latin American stock markets but not vice-versa. And also find that the exchange rate of a Latin American country affects its own stock market, suggesting that currency risk is an important source of risk in Latin America.

Adaramola, Anthony Olugbenga (2011) investigated the impact of macroeconomic indicators on stock prices in Nigeria (study based on the individual firm's level), using both time series and cross-sectional data. Quarterly data from 1985:Q1 and 2009:Q4 were used for the analysis. The macroeconomic variables used for the study were money supply (BRDM), interest rate (INTR), exchange rate (ECHR), inflation rate (INF), oil price (OIL) and gross domestic product (GDP). The empirical findings of the study revealed that macroeconomic variables have varying significant impact on stock prices of individual firms in Nigeria. Apart from inflation rate and money supply, all the other macroeconomic variables have significant impacts on stock prices in Nigeria.

Abdullah, Saiti & Masih (2014) investigated the lead-lag relationship between stock market index and macroeconomic variables, using wavelet analysis, cointegration and VECM. Monthly data from January 1996 to September 2013 was considered for the study. Variables used include Kuala Lumpur Composite Index, exchange rate, inflation, government bond yield, short-term interest rate and export. Findings suggested that the cointegration relationship does exist between KLCI and selected macroeconomic variables. The results of the error correction model, the generalized variance decompositions as well as the wavelet cross-correlation analysis suggested that the short-term interest rate, KLCI and government bond yields are exogenous variables; especially, the short-term interest rate is the most leading variable.

Data and Econometric Methodology

We consider developing countries group named BRIC (Brazil, China, India and Russia) for our study. We not considered South Africa for our study since it has been added in the group after 2010 and also its non availability of data for the study period. This developing countries group is contributing around 30% of world GDP. The study use monthly data from April 1999 to February 2017 for Exchange and the famous equity market indices of BRIC countries (sources: Bloomberg and IFS). We used returns value for stock prices and growth rate for exchange rates. This transformation helps to perform the econometric modeling.

Table 1: Descriptive statistics for BRIC countries return data.

VARIABLE NAME	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
BRAZIL_IBX_RETURNS	1.382	1.370	22.686	-38.981	7.842	-0.689	6.133
CHINA_SHCOMP_RETURNS	0.787	0.710	32.056	-24.632	8.008	0.091	4.701
INDIA_SENSEX_RETURNS	1.105	1.154	28.255	-23.890	6.961	-0.117	4.018
RUSSIA_INDEXCF_RETURNS	1.988	2.316	53.036	-44.154	11.535	0.160	6.392
BRAZIL_ER	0.009	-0.003	0.873	-0.463	0.146	1.657	12.454
CHINA_ER	-0.006	0.000	0.272	-0.171	0.036	1.650	21.750
INDIA_ER	0.131	0.033	5.459	-3.797	1.086	0.502	7.293
RUSSIA_ER	0.224	0.038	12.671	-7.657	1.906	1.621	16.439

We apply descriptive statistics for the transformed data. The equity market returns of these countries are more or less have same volatility except Russia stock market (11.535) which means that Russian stock market (INDEXCF index) is giving more returns upon bearing higher risk (higher risk yields higher the return). Whereas India has less volatility (6.961) which mean that investing in Indian stock market is safer when compare to rest of the countries in BRIC group. The other two countries China and Brazil are good to invest upon bearing moderate risk.

Table 2: Unit root test results for BRIC countries stock market and exchange rate

Country	Variable name	P-value	Test statistic	R-squared	Durbin-Watson stat	Test critical values	
Brazil	Brazil IBX returns	0	-14.997	0.494	1.985	1% level	-3.458
China	China_SHCOMP returns	0	-13.375	0.437	2.018		
India	India_SENSEX returns	0	-14.241	0.469	2.005		
Russia	Russia_INDEXCF returns	0	-13.036	0.425	2.032	5% level	-2.874
Brazil	Brazil_ER	0	-16.344	0.537	1.989		
India	India_ER	0	-14.204	0.467	1.973	10% level	-2.573
China	China_ER	0.0218	-3.191	0.430	2.063		
Russia	Russia_ER	0	-11.680	0.372	1.980		

We use ADF unit root test to check the stationarity property of these data. The table 2 displays results of the Augmented Dickey-Fuller test (ADF) unit root analysis. We plot our model at level of growth and return data to make sure that our series have time series properties to avoid the spurious relationship.

We apply VAR model to check the absence or presence of exchange rate shocks on stock market fluctuations. A shock to the one variable not only directly affects that variable's dependent variable but is also transmitted to all of the other endogenous variables through the dynamic (lag) structure of the VAR. We develop Impulse Response Function (IRF) from the Value at Risk (VAR) model to analyze how the equity markets of BRIC countries react to the changes in the exchange rates of other BRIC countries.

Empirical Results

Figure 1 and 2 shows the results of Impulse Response Function of the BRIC equity market returns to shocks of Exchange rates. Figure.1 examines the responses of Brazil and China to Cross country exchange rates and the stock market shocks. The graphs in Figure 1 suggest that the movements in the exchange rate of Brazil and India do not affect the stock markets of China but the exchange rate of Russia affects the stock market returns of China (graph 1.p). And also China receives effect from its home currency movements as well (graph 1.n)

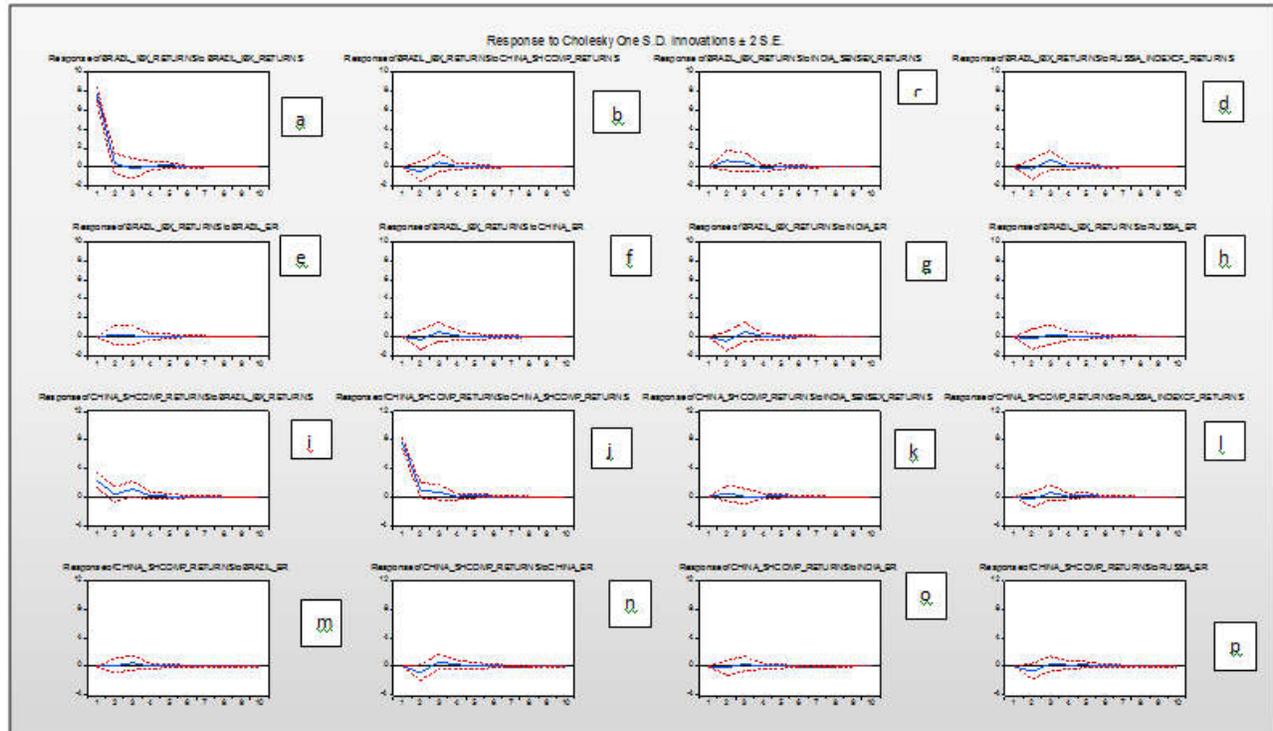


Figure 1: Responses of Brazil and China to Cross country exchange rates and stock market shocks.

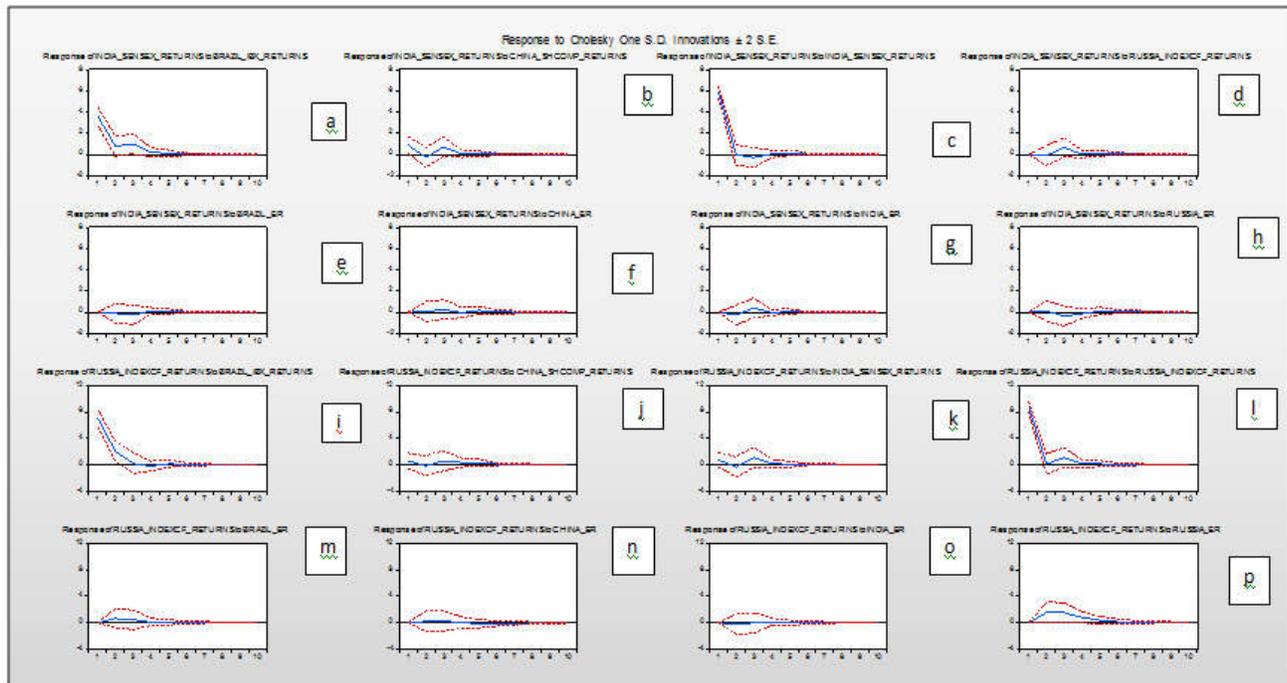


Figure 2: Responses of India and Russia to Cross country exchange rates and stock market shocks.

Figure .2 shows responses of India and Russia to Cross country exchange rates and stock market shocks. The Graphs in Figure.2 shows that exchange rate of Brazil, Russia, India and China does not affect the stock markets of India and Russia. But the stock market returns of Brazil and Russia impact the Indian stock market return (graph 2.a and graph 2.d) and also the Russian stock market receives the shocks from its own currency change.

CONCLUSION

In this study, we employed VAR model and used monthly data of exchange rate and stock market indices to Brazil, Russia, India and China nations. Overall, the study find a little positive evidence that BRIC equity market returns are receiving shocks in cross country exchange rates(graphs 1.p 1.n, and 2.d). Given these results the study come with the evidence that (a) Cross-country exchange rate are not very useful for forecasting BRIC countries stock markets returns (b) Policymakers and investors should consider stock markets movements of India and China to reduce the risk when they take decisions.

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