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Determinants of stock returns in BRICS countries

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Abstract

This paper investigates on determinants of stock return for BRICS countries. The relationship between stock market return and macroeconomic variables can be used to make nation's macroeconomic policies and the performance of stock return can be a benchmark for a country to highlight the country is in well economic condition or not. This paper employs the test on pooled data from 2011 to 2015 on monthly basis, to examine the factors that affect stock return the most. Exchange rate, money supply, inflation and trade are selected as the macroeconomics variables factors that affect stock market return. All these factors lead to strong significant relationship towards stock market return by present or doing well towards each factor.

Keywords: *stock return; exchange rate; money supply; CPI; trade*

1. INTRODUCTION

This paper explains the determinant of stock return in Brazil, Russia, India, China and South Africa (BRICS) countries. It shows that which macroeconomic variables will affect the most towards stock return among these countries. Stock return can be a benchmark for a country to show that the country itself either in good economic performance or not. There are many factors can affect the stock return, so this paper only highlight selected variables that will affect stock return. If a country has a better performance on stock return, it signals that the country is in good economic performance and it will attract many potential investors to invest in the country and vice versa. Moreover, these countries are selected because of high population, world gross product and have potential to be important player in world of economic. In general, stock markets are mediums or places that allow suppliers and demanders of stocks to make financial transactions. Both of the suppliers and demanders have the goals to permit such transaction to be made quickly and at a fair price. A nation's macroeconomic policies can be made by using the relationship between stock market return and macroeconomic variables stated by Maysami, Howe, & Hamzah, (2004). Factors like enterprise performance, dividend, stock prices of other countries, gross domestic product, exchange rate, interest rate, current account, money supply, employment, their performance etc. have an impact on daily stock prices (Kurihara, 2006). Rapid economic growth and geopolitical influence, the BRICS (Brazil, Russia, India, China and South Africa) countries are expected to become important player in the world economy and come out with a new world order, that will establish a balance of power between developed and emerging economies. According to Neill and Stupnytska (2009), in terms of economic for the next four decade, the BRICS grouping could overtake those of the US and European Union blocks. As of 2015, the five BRICS countries represent over 3 billion people, approximately 42% of the world population; where these five members are in the top 25 of the world by population, and four are in the top 10. Among these five countries, combination nominal GDP of US$16.039 trillion, equivalent to approximately 20% of the gross world product, and an estimated US$4 trillion in combined foreign reserves. The growing capital market among BRICS countries shows that those countries are becoming the important center for direct and portfolio investments in the world. The stock market capitalization of BRICS equity markets have grown considerably in the last decade. Besides, China's share of global market capitalization has grown from 1% in 1999 to 11% in 2010 stated by Moe et al (2010). Moreover, many of

authors expect that China will overtake the US in terms of stock market capitalization by 2030, due to its expanding investment and high economic growth in China.

2. PROBLEM STATEMENT

Growing inter linkages among the global economies in the modern era invites a major menace of spread of financial distress from one market, asset class and nation to the other markets. Financial crisis have become a part and parcel of the modern financial system. A common base for these crises arise is due to searching for higher return and come along with risk of higher return. The crises that originated from the developed economies not only affect their own countries but also have spillover effect on the emerging economies and other developing countries. The financial meltdown of October 2008 sent stock markets in BRIC economies tumbling as foreign investors fled. BRIC economies will feel the effects when the global economy is set to slow in 2009. China and Brazil will see weaker demand from the USA and Europe for their exports, while India's services sector, oriented towards developed economies, could suffer. Russia is the most vulnerable of the BRIC countries as it is heavily reliant on the hydrocarbon sector, which will be hit by falling energy prices. However, BRIC are more resilient to the crisis due mainly to; have large trade surpluses and foreign exchange reserves. Governments are set to use the reserves to increase spending and boost consumer demand. These happen before the entry of South Africa in joining the BRIC countries. BRICS nations have demonstrated economic resilience by weathering the global financial crisis rather well and are expected to play central role in post-crisis global economy. Economies of Brazil, Russia, India, China and South Africa (collectively called BRICS) have demonstrated economic resilience by weathering the global financial crisis. Besides, most investor invest in stock market with the objectives of maximization their return without taken into consideration the effect of macroeconomic variables such as inflation, interest rate and exchange rate on the stock prices. Therefore, they must studied for how to invest which stock that gain more profit such as invest in Brazil, Russia, India, China, and South Africa stock which the stock markets is in developing or newly industrialized countries and attracted world attention as market in the future with a lot of potential for investor.

3. LITERATURE REVIEW

3.1 Stock Return

All of the countries in this world have their own place for trading transaction which is called as stock market. According to Asaoulu and Ogunmuyiwan (2011) states that stock market plays a major role in both developed and developing countries by controlling redundant resources from the surplus to deficit units in the economy. A number of studies about how macroeconomic factors are affecting stock return have been investigated by many researchers long time ago. According to Harasheh and Abu Libdeh (2011) they include GDP, inflation rate, exchange rate and others to examine the stock price in Palestine. Besides, other researcher like Pearce (1983) is involved in investigating the relationship between stock market and the economy too where the outcome of all these studies shows that macroeconomic factors have an effect on stock market return. Other researcher like Maysami and Sims (2002, 2001a, 2001b) employed the Error-Correction Modelling technique to examine the relationship between macroeconomic variables and stock returns in Hong Kong and Singapore study from (Maysami and Sim, 2002b), Malaysia and Thailand (Maysami and Sim 2001a), and Japan and Korea (Maysami and Sim 2001b) state that there are causal relationship between the macroeconomic variables with stock return. Furthermore, researcher like, Islam (2003) conducted the studies to examine the short-run dynamic adjustment and the long-run equilibrium relationships between four macroeconomic variables (interest rate, inflation rate, exchange rate, and the industrial productivity) and the Kuala Lumpur Stock Exchange (KLSE) Composite Index and the result come out state that there existed statistically significant short-run (dynamic) and long-run (equilibrium) relationships among the macroeconomic variables

and the KLSE stock returns. Maysami and Koh (2000) examined such relationships in Singapore. They found that inflation, money supply growth, changes in short- and long-term interest rate and variations in exchange rate formed a cointegrating relation with changes in Singapore's stock market return levels. Islam and Watanapalachaikul (2003) showed a strong, significant long-run relationship between stock prices and macroeconomic factors (interest rate, bonds price, foreign exchange rate, price-earnings ratio, market capitalization, and consumer price index) during 1992-2001 in Thailand.

3.2 Exchange Rate

The existence of a relationship between stock market return and exchange rate has receives considerable attention. Early studies from Aggarwal (1981); Soenen and Hennigar (1988) in this area only the correlation between two variables- exchange rate and stock returns. Theory explained that a change in the exchange rate affect a firm's foreign operation and overall profits which would, in turn, affect its stock prices (stock market return) depending on the multinational characteristics of the firm which mean have positive relationship. In recent year, all business is directly and indirectly affected by international activities as a result of globalization. In other words, exchange rate changes may affect the competitive position of companies and hence industries operations. Other researcher like Ozcam (2009) and Altay (2003) stated that exchange rates influence stock returns and relationship are existed between stock return and the exchange rate. According to Yang and Doong (2004) find that stock market movements have a significant impact on future exchange rate changes for the G7 countries over the period 1979-1999. Phylaktis and Ravazolo (2005) show, from applying the cointegration methodology and multivariate Granger causality test to a group of Pacific Basin countries, that stock and foreign exchange markets are positively linked. Pan et al. (2007) use a VAR approach to analyze the links between exchange rates and stock markets for seven East Asian countries, and provide evidence of a significant bidirectional relationship between these markets before the Asian financial crisis. Other studies like, Kim (2003) uses the error correction technique and the co integrating system to investigate whether a long term relationship exists between the exchange rates and the stock prices in the United States. The data set used is the S&P 500 which yields that there is a negative relationship that exists for the stock returns in USA with the value of the dollar. According to Bilson, Brailsford and Hopper (2001) they conclude that devaluation of the domestic currency has a negative relationship with returns. The change in exchange rate is calculated as the natural logarithms of the exchange rate at month.

3.3 Money Supply

Money supply is one of the most basic parameters in an economy and measures the abundance or scarcity of money. Stock prices tend to move higher when the money supply in an economy is high According to Kohout (2010), the most important factor influencing the development of stock prices in the long term is the amount of money in the economy (i.e. money supply). Also Flannery and Protopapadakis (2002) include the money supply, unemployment, trade balance, the number of new residential buildings and the Producer Price Index. According to Maskay (2007) and Chromec (2006), one of the most effective tools available to the national central banks of individual countries are the monetary policy or change in money supply, where it influencing the actual economic activity. Poiré (2000) and Shostack (2003) consider the money supply as the instrument of the monetary policy, to be the most important macroeconomic factor that influences the behavior and the development of stock prices. Maskay (2007) and Ioannidis, Kontonikas (2005) consider the stock market to be the basic indicator of the condition and development of the economy strongly influencing and preceding it. These authors also consider the money supply to be a strong determinant of the stock market, i.e. of the entire economy. Money supply can affect stock prices directly, when there is more money in the economy than can be utilized so they are allocated to investments. According to Maysami and Koh (2000) who, in the conditions of the Asian market revealed a positive relationship between the money supply and the development of the SGX index

(Singapore stock exchange), confirming the hypothesis that a growth in the money supply will cause inflation, which causes a growth in future cash-flow and share prices. The same results confirm Maysami, Howe, Hamzah (2004), who discloses a positive dependence between money supply change and stock price evolution on Singapore stock exchange. On the Japanese market, Kimura and Koruzomi (2003) state that they had discovered no relationship between the change in the money supply and the development of stock prices. The positive relationship between macroeconomic indicators (including the money supply) is also demonstrated by Hanousek, Filler (2000) who confirmed a positive relationship between the money supply and stock prices in the conditions of Central Europe in 1993-1996. Positive correlation and causal relationship between the money supply and stock prices in the U.S. market have been shown in by Maskay (2007) and Flannery, Protopapadakis (2002), Poiré (2000) in their respective studies.

3.4 Inflation Rate

Inflation rate is a sustained increase in the general price level of goods and services in an economy over a period of time. According to (Stock Market Return and Inflation Forecast, 2007), inflation effects on an economy are various and can be simultaneously positive and negative. The past decades has witnessed and increase preoccupation with monetary variable such as exchange rate and inflation rate Solnik (2009). Furthermore, he stated that the negative relationship between stock prices and inflation rate has been found in U.S data. In addition to the inflation effect towards the stock market return, a significant negative relationship between inflation and stock market return has been found (Omran & Pointon, 2001). In theory, there is a case to support the view that since the rate of inflation means an increase in the general level of prices, and since common stocks can be considered as capital goods, then the stock prices should move with the general level of prices. So, when the general inflation rate increases, common stocks should also increase to compensate investors for the decrease in the value of money. It is expected that there is a positive relationship between the inflation rate and stock prices. Shoil et al., (2011) explored long run and short run dynamic relationships between KSE100 index and five macroeconomic variables where they applied Johansen cointegration technique and VECM in order to investigate the long run and short run relationships. The study used monthly data for analyzing KSE100 index and the findings revealed that in the long run, there was a positive impact of inflation, GDP growth and exchange rate on KSE100 index, while money supply and three months treasury bills rate had negative impact on the stock returns.

3.5 Trade

Trading volume is defined as the number of shares traded each day and is an important indicator in technical analysis as it is used to measure the worth of stock price movement either up or down Abbondante (2010). Investors' motive to trade is solely dependent on their trading activity; it may be to speculate on market information or portfolios diversification for risk sharing, or else the need for liquidity. According to Lee and Rui (2002) found that returns Granger cause trading volume in the US and Japanese markets. Besides, their result showed that trading volume does not Granger cause returns in the US, UK and Japan markets. In their study, De Medeiros and Doornik (2006), found a contemporaneous and dynamic relationship between return volatility and trading volume by using data from the Brazilian market. According to Mahajan and Singh (2009), they found a positive correlation between trading volume and volatility. Their study also gave evidence of one-way causality from return to volume. More recently, the study by Choi et al. (2012) found the significance of trading volume as a tool for predicting the volatility dynamics of the Korean market by using GJR-GARCH and EGARCH models. Significant efforts have been made, empirically and theoretically, on the phenomenon of stock price and volume relationship. Although the majority of those findings have confirmed the existence of positive contemporaneous relationship between trading volume and returns, the study of different stock markets have given mixed results about the causal return-volume relationship. In recent studies researchers have found contemporary and

lag relation between stock returns and trading volume (see, e.g., Chen, Firth and Rui, 2001; Khan and Rizwan, 2001; Lee and Rui, 2002; Pisedtasalasai and Gunasekarage, 2008). Furthermore, Kumar et al. (2009) investigate the nature of relationship between price and trading volume for Indian stock market and show that there is a weak dynamic relationship between stock returns and trading volume.

4. RESULT

4.1 Descriptive statistics

Table 1: Descriptive statistics

variable	obs	mean	Std. Dev	Min	Max
year	300	2013	1.416576	2011	2015
code	300	3	1.416576	1	5
stock	300	23.65414	21.13114	1.30584	68.5867
exchangerate	300	22.8195	22.38536	1.5493	72.5209
ms	300	618.3246	799.3599	0.24826	2469.08
cpi	300	121.5369	13.16704	101.631	156.967
trade	300	54.36375	64.06083	6.091853	231.4073

The table shows a descriptive statistics of the five (5) BRICS countries for 5 years approximately monthly, from 2011 until 2015 for each dependent and independent variables. Mean in a basic word alluding to the average quality for every variables. Minimum demonstrates the lowest number of data while the greatest is the most elevated number in that specific variable. In addition, there is the figuring of standard deviations which represent to the scattering or dispersion of the data for every variable. Huge estimation of standard deviation demonstrates the data were spread in an expansive extent. The data used by the researcher resulted that the highest mean value is money supply where the value is 618.3246 and the lowest value is exchange rate where the amount is 22.8195. For minimum and maximum evaluation, the lowest data value was found in money supply data with 0.24846 while the highest value is 2469.08 found in money supply. Moreover, standard deviation value shows that money supply represent the highest value, with 799.3599 followed by trade 64.06083, exchange rate 22.38536, stock return 21.13114 and consumer price index (CPI) 13.16704. From this result, we know that money supply had large dispersion value in its data. In addition, for the lowest standard deviation value this which is refers to the CPI and had a huge gap between the mean.

4.2 Random Effect GLS Regression Test Model

In this model, all the unsettling influence and issue have been disposed of. From the above results, this model is acceptable to be utilized as a part of this study, when the Prob > chi2 shows 0.000 which is the outcome indicates 0.0000. For the significant of the variable, the result appears in P > | z | must underneath 0.05, to classify as the significant variable. From the outcome, the exchange rate, money supply, consumer price index (CPI), and trade are significance to stock return, has shown in p – values at 0.0000 to all independent variables. For the R – squared result, the overall will be observed to explain the model. From the outcome, 78.46% can be explained in this study, and the rest will be explained by the residuals. For the interpretation of the coefficients, a 1% increase in exchange rate, it will decrease in 0.8724% in stock return, a 1% increase in money supply, it will increase 0.0091% in stock return. For a 1% increase in consumer price index (CPI), it will increase 0.4550% in stock return and lastly, a 1% increase in trade; it will decrease in 0.2139% in stock return. Based on the final result, the analysis is only can be further until Random Effect Regression where the Breush and Pagan Lagrangian multiplier test give a significant result and also Hausman Fixed test give a significant result but when continue to the Fixed Effect Regression, the r squared scored zero (0) which mean these independent variables cannot

explain the dependent variable. So, that is why the analysis only can be done until Random Effect Regression analysis.

Table 2: Random-effect regression

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Random-effects GLS regression                   Number of obs      =       300
Group variable: code                            Number of groups   =         5

R-sq:  within  = 0.0542                         Obs per group: min =        60
       between = 0.8446                                        avg =      60.0
       overall = 0.7846                                        max =        60

Random effects u_i ~ Gaussian                   Wald chi2(4)       =   1074.84
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000
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stock	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
exchangerate	-.8723679	.0367078	-23.77	0.000	-.9443139	-.800422
ms	.0091171	.0009423	9.68	0.000	.0072703	.0109639
cpi	.4550364	.0529934	8.59	0.000	.3511712	.5589016
trade	-.2139467	.0098558	-21.71	0.000	-.2332637	-.1946296
_cons	-5.748937	6.230836	-0.92	0.356	-17.96115	6.463278
sigma_u	0					
sigma_e	3.2786461					
rho	0	(fraction of variance due to u_i)				

5. METHODOLOGY AND DATA

In the study, the researcher use secondary data in collecting data. A great deal of study had been finished by different specialists in distinctive countries and the outcomes were changing among them. Subsequently this examination is led to inspect the determinants of stock return for period 2011 until 2015 (monthly).The data of Brazil Bovespa Index (iBOVESPA), Russia's stock market indices, Moscow Interbank Currency Exchange (MICEX) and the Russian Trading System hence the name "Moscow Exchange MICEX-RTS", India's stock market indices, S&P BSE SENSEX (S&P Bombay Stock Exchange Sensitive Index), China stock market indices (SSE Composite Index) and South Africa's stock market indices JSE Limited, from the year 2011-2015 (monthly) is taken. For the independent variables money supply, exchange rate, inflation rate and trade are selected that were used to find the relationship between dependent and independent variables in order to get the final result of this research. The final model will be used in this study is Random Effect Regression, the model can be developed from the

$$SR = \bar{\alpha}o + ß_1ER_{l,t} + ß_2MS_{i,t} + ß_3CPI_{i,t} + ß_4TR_{i,t} + Ɛ$$

Hypothesis statement is the assumption of the relationship between two or more variables expresses in the form of a testable statement, which carry clear implications for testing the stated relations.

Hypothesis 1: There are significant and negative relationship between Exchange Rate and Stock Return.

Hypothesis 2: There are significant and positive relationship between Money Supply and Stock Return.

Hypothesis 3: There are significant and positive relationship between Consumer Price Index and Stock Return.

Hypothesis 4: There are significant and negative relationship between Trade and Stock Return.

6. CONCLUSIONS

In this study we utilized element panel data techniques to analyze the determinants of stock return in the BRICS countries. In particular, the goal of this exploration is to assess the significant relationship and its direction of exchange rate, money supply, consumer price index (CPI) and trade from 2011 until 2015 which include countries Brazil, Russia, India, China and South Africa with the stock return. In depth, this exploration is to examine which of the determinants tried give the most elevated effect toward the stock return between these countries. All of the above objectives have been achieved. From the last aftereffect of the study, researcher found that exchange rate is significant and positive relationship between exchange rate and stock return. Furthermore, it is supported by the researcher from Pan (2007) that provides evidence of a significant bidirectional relationship between these exchange rate and stock return before the Asian financial crisis. Other researcher Aggrawal (1981); Soenen and Hennigar (1988) state that the existence of a relationship between stock market return and exchange rate received considerable attention. Theory explained that a change in the exchange rate affect a firm's foreign operation and overall profits which would, in turn, affect its stock prices (stock market return) depending on the multinational characteristics of the firm. However it contradicts with studies who found that exchange rate has a negative relationship with stock return. Nevertheless the negative relationship finding is supported by other researcher from Kim (2003) where he used to investigate whether a long term relationship exists between the exchange rates and the stock prices in the United States. The data set used is the S&P 500 which yields that there is a negative relationship that exists for the stock returns in USA with the value of the dollar. For the money supply, there are significant and positive relationship between money supply and stock return. This result is supported by other researchers from Maskay (2007); Flannery and Protopapadakis (2002), Poiré (2000) in their respective studies that positive correlation and causal relationship between the money supply and stock prices in the U.S. market have been shown and also supported by Habibullah, Baharumshah (1996), stated that in the conditions of the U.S. stock market there a positive influence of the money supply on the development of stock prices was found by Malliaris, Urrutia (1991), Mookerje (1987) and Jeng, et al. (1990).

However, it is differ with Kimura, Koruzomi (2003) who discovered there are no relationship between the change in the money supply and the development of stock prices. There is significant and positive relationship between inflation and stock return that supported by Boudoukh and Richardson, (1993); Boudoukh et al. (1994) where it stated that the relationship between the inflation rate and international stock returns tend to be positive in the long horizons. However, most of the study indicates that inflation has a negative relationship with the stock return. Nevertheless, the negative relationship finding is supported from Lintner (1975); Bodie (1976); Jaffe and Mandelker (1976); Nelson (1976); Fama and Schwert (1977) where it stated that early empirical studies demonstrated a negative relationship between the inflation rate and stock returns. Same goes to Asprem (1989) and Wasserfallen (1989) who explored the relationship between macroeconomic variables, and stock prices and asset portfolios in European countries. They found a negative relationship between the inflation rate and stock prices. Also, Najand and Rahman (1991) argued that the volatility of inflation increases the volatility of stocks, thus in turn causing a higher required rate of return on stocks, which means a fall in stock prices, which means negative relationship between inflation and stock return. Lastly, for the trade, there is significant and negative relationship between trade and the stock returns. According to Granger and Morgenstern (1963) this result can be supported and also can be argue, where they conduct an early empirical study based on New York Stock Exchange (NYSE) composite index from 1939-1961 and it resulting a negative relationship between absolute value of daily stock price changes and daily trading volume. Mostly it differs with many other

researchers where most of them found a positive relationship between trade and stock returns. Researchers like Mahajan and Singh (2009), De Medeiros and Doornik (2006) and Choi (2012) found positive relationship between trading volume and stock prices.

7. RECOMMENDATIONS

From this study, not all independent variables like exchange rate, money supply, consumer price index (inflation) and trade can clarify the determinants of stock return. There are a few activities will be proposed some suggestion and recommended to the future researcher for the flawlessness of this study. In future, the other researcher needs to consider and pick alternate variables for the examination about this subject will give the genuine effect on the stock return. The chosen variables are not sufficiently solid to clarify the determinants of stock return. Along these lines, the future analyst can change by utilizing different variables like oil price, unemployment rate or interest rate. Other variables may give a superior comprehension about these issues. Prior to that, a researcher is advised to use daily basis to increase the length of the sample period to be more accurate and less argue. Future researcher also can make a research on this issue by choosing other countries. The system also can be change by the future researcher by using other programmer to analyzed and interpret the data obtained. One of the recommended is Time Series Analysis. By using the other programmer, the analysis might give a clear and better relationship between dependent and independent variables in term of the direction and significance of a relationship.

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