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Impacts of Macroeconomics Environment and Governance Quality on the Stock Market in the Fourteen Developing Countries

(*Impak Persekitaran Makreokonomi dan Kualiti Tadbir Urus ke atas Pasaran Saham di Empat Belas Buah Negara Membangun*)

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ABSTRACT

Using the annual data from 2008 to 2016 for fourteen developing countries, this study examines the relationship between governance quality and stock market performance. This study used four different indicators, namely stock market return, stock market volatility, stock market development, and stock market liquidity to reflect the stock market's performance from various aspects. The study also combined the four indicators and formed a new proxy to reflect overall stock market performance by using principal component analysis. The two-step system of GMM estimation was used to test the impact of the macroeconomic environment and governance quality on stock market performance. Specifically, the results obtained show that banking sector development and governance quality have a significant negative relationship with stock market volatility. Meanwhile, the income level has a significant negative relationship with stock market volatility, development, and liquidity. These results suggest that developing countries should strengthen the position of the banking sector and allows the funds to be channeled into the stock market efficiently. Besides that, developing countries also need to improve their governance quality to attract foreign investors. Several policies shall be implemented by the developing countries to improve governance quality in the aspects of voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and control of corruption.

Keywords: Stock market performance; governance quality; macroeconomic factors

ABSTRAK

Dengan menggunakan data tahunan dalam tempoh tahun 2008 hingga 2016 daripada empat belas buah negara membangun, kajian ini bertujuan untuk mengkaji hubungan antara kualiti tadbir urus dengan prestasi pasaran saham. Kajian ini menggunakan empat indikator yang berbeza iaitu pulangan pasaran saham, kemeruapan pasaran saham, pembangunan pasaran saham, dan kecairan pasaran saham untuk mencerminkan prestasi pasaran saham daripada pelbagai aspek. Kajian ini juga menggabungkan empat indikator dan membentuk proksi baharu untuk mencerminkan prestasi keseluruhan pasaran saham dengan menggunakan analisis komponen utama. Penganggar GMM sistem dua langkah turut digunakan untuk menguji kesan persekitaran makroekonomi dan kualiti tadbir urus prestasi pasaran saham. Penemuan kajian menunjukkan bahawa sektor perbankan dan kualiti tadbir urus mempunyai hubungan negatif yang signifikan dengan kemeruapan pasaran saham. Sementara itu, tahap pendapatan mempunyai hubungan negatif yang signifikan dengan kemeruapan pasaran saham, pembangunan dan kecairan pasaran saham. Hasil kajian ini menunjukkan bahawa negara-negara membangun harus memperkukuhkan kedudukan sektor perbankan dan membolehkan dana disalurkan ke pasaran saham dengan cekap. Di samping itu, negara-negara membangun juga perlu meningkatkan kualiti tadbir urus untuk menarik perhatian pelabur asing. Beberapa dasar harus dilaksanakan oleh negara-negara membangun untuk meningkatkan kualiti tadbir urus dalam aspek suara dan kebertanggungjawab, kestabilan politik, keberkesanan kerajaan, kualiti pengawalseliaan, peraturan undang-undang dan kawalan rasuah. .

Kata kunci: Prestasi pasaran saham; kualiti tadbir urus; faktor makroekonomi

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INTRODUCTION

In recent decades, developing countries have attracted the attention of researchers due to their ability to grow faster than developed markets (Carp, 2012). Interestingly, Rocha and Moreira (2010) reported that developing countries were least impacted by the 2008 Global Financial Crisis (GFC). Indeed, the economies of developing countries differ from those of

developed countries due to numerous factors, including political stability, as well as law and order (Khan et al. 2017). Moreover, the economic development of a country is also greatly influenced by stock market development as the productive capital available in the economic system mostly originates in the stock market (Pan & Mishra, 2018; Setayesh & Daryaei, 2017). Besides that, the stock market performance also driven by several macroeconomic factors. It is also crucial for investors or policymakers to figure out significant macroeconomic factors that affect the stock market.

As a barometer for determining the health of a country's economic system, stock market performance has attracted attention from practitioners, academicians, researchers and investors (Ajide, 2014; Chuang & Wang, 2009). The stock market also serves as a platform for linking the surplus and deficit sectors of the economic system and enabling the listed companies to raise equity capital by issuing shares to the public. However, stock market performance can be measured in different ways, such as stock market development and stock market returns, as evidenced by previous studies (Simplice, 2012; Lawal et al., 2018). Technically, both stock market development and stock market returns vary in terms of measurement. For instance, stock market development has been measured using market capitalization ratios, where the market capitalization is calculated using the market value of listed companies (Zhou et al., 2015). Meanwhile, stock market returns are measured using the percentage of logarithm changes in the stock index (Narayan et al., 2015).

Since the establishment of arbitrage pricing theory (APT) by Ross (1976), numerous studies have been conducted to investigate the main macroeconomic determinant of stock market performance. Generally, previous studies' findings show a consensus that stock markets are highly affected by macroeconomic variables, such as inflation (Maku & Atanda, 2010; Naceur et al., 2007), income level (Cherif & Gazdar, 2010; Gan et al., 2006), foreign direct investment (Adam & Tweneboah, 2009; Malik & Amjad, 2013) and exchange rate (Maysami et al., 2004; Ratanapakom & Sharma, 2007)

In addition to macroeconomic factors, Qiu and Song (2016) stated that stock markets can also be affected by other factors, such as political factors. However, political factors may affect stock markets either positively or negatively (Hira, 2017). As outlined by Pastor and Veronesi (2013), stock prices react positively when the government can effectively handle unanticipated shocks through interventions in the stock market. On the other hand, political uncertainty - also known as systematic risk cannot be diversified and tends to affect stock prices negatively. Hence, the impact of political news or information cannot be neglected as it can influence international investors' investment decisions (Maqbool et al., 2018).

The impacts of world events on stock prices, whether increase or decline, have long attracted the interest of financial economists seeking to find the reasons behind them (Chau et al., 2014). In the aftermath of a financial crisis, poor governance quality has been believed to have adverse effects on stock market development (Low et al., 2015). In a study related to investment allocation, Aggarwal et al. (2003) revealed that fund managers tend to invest more in countries with better legal institutions and governance quality. In an environment with better institutional quality, there is substantial punishment for fraudulent behaviour; thus, investors feel secure and are more likely to engage in investment activity (Asgharian et al., 2014). In addition to enhanced investment activity, Hooper et al. (2009) revealed that investment in better governed countries could generate higher returns with the lowest risk level.

A considerable amount of related literature exists. For instances, Simplice (2012) studied the impact of institutional quality on stock market development; Boadi and Amegbe (2017) studied the impact of institutional quality on stock market returns; and Low et al. (2011) studied the impact of institutional quality on stock market volatility. However, these studies were limited to only one measure of stock market performance. Thus, the current study sheds some light on this controversy by using various measures for stock market performance to form a new proxy.

The main gap in the existing research is the lack of evidence for the impacts of macroeconomic and institutional variables to the aggregate stock market performance. Unlike previous studies, this study forms a new proxy to measures the aggregate stock market performance and identifying its determinants. First, the findings of this study are expected to help the market participants to observe and measure the aggregate stock market performance in an easier way. Second, the findings of this study also contribute in identifying the significant determinants to the aggregate stock market performance. These findings shall be used as guidelines for the policymakers in the future.

This study aims to investigate the impacts of governance quality on stock market performance by using panel data from 14 countries from 2008 to 2016. This rest of the paper is organized as follows: Section 2 discusses the related literature, while Section 3 discusses the data and methodology applied in the study. Section 4 covers the results and discussions, and the conclusion is included in Section 5.

THEORETICAL AND LITERATURE REVIEW

Abirtrage Pricing Theory (APT) as introduced by Ross (1976) hypothesized that stock prices are affected by multiple factors. APT does not limit the type of factors to be used or tested in the analysis, which enables the researcher to select any factors

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that provide the best explanation for the specific sample (Jecheche, 2012). However, APT had fewer assumptions as follow: (1) *Investors agree on the number and types of factors that significantly affect the stock price*; (2) *No riskless arbitrage profit opportunities*; (3) *Perfectly competitive capital market*; and (4) *The investor prefers more wealth*. Ahmed (2019) also argued that the principle of arbitrage was an essential aspect of APT. Based on APT, previous studies have attempted to identify the key macroeconomic factor that affects the stock market performance in several countries (Adam & Tweneboah, 2009; Cherif & Gazdar, 2010; Gan et al., 2006; Malik & Amjad, 2013). On the other hand, there were two primary advantages to using macroeconomic factors to predict stock returns under APT (Azeez & Yonezawa, 2006). Firstly, it makes economic interpretation meaningful and helps to identify significant macroeconomic factors. Secondly, the use of macroeconomic factors also helps to explain the stock price reactions to macroeconomic news.

Macroeconomic factors tend to influence investor's decisions; thus, the relationship between macroeconomic factors and stock market performance is an interesting subject to study (Khan, 2014). To date, numerous studies have been conducted to explore the relationship between macroeconomic variables and stock market performance. For instance, Singh (2014) and Gurloveleen and Bhatia (2015) revealed that Indian stock market indices could be influenced by foreign investments and currency exchanges. On the other hand, Ouma and Muriu (2014) confirmed that Kenya's stock market returns could be influenced by money supply, inflation, and exchange rates. Furthermore, Paul et al. (2017) confirmed that banking sector development is the most influential factor affecting stock market development in sub-Saharan Africa. However, these findings were limited to the impact of the macroeconomic environment on the stock market.

As argued in the seminal work of Yartey (2008), political risk is another factor to consider when foreign investors make investment decisions. A number of subsequent studies explored the impacts of governance quality on the stock market performance. A previous study by Hooper et al. (2009) examined the relationship between governance quality and stock market performance by using a sample of 50 developed and developing markets. They used stock index returns and stock market volatility as the proxies for stock market performance and found governance quality was positively related to stock index returns and negatively related to stock market risk. Their results also suggested that governance quality plays an important role in affecting market risk and returns. On the contrary, Low et al. (2011) found that governance quality is negatively related to stock index returns. Among all the proxies used, their results suggested that only political stability and the absence of violence are key governance indicators, whereas voice and accountability have no effect on stock market returns.

In African countries, Simplice (2012) revealed that the government's governance quality is positively associated with stock market performance. The proxies used for the stock market were market capitalization, value traded, turnover and number of listed companies. The impact of governance quality on stock market performance was further investigated by Ajide (2014) and focused the test based on one country only. Ajide (2014) revealed that the Nigerian stock market's performance was positively affected by the control of corruption and government effectiveness but negatively affected by political instability. However, Low et al. (2015) showed that governance quality is negatively related to market risk in a developing market.

Using data from selected sub-Saharan countries from 2001 to 2013, mixed results were reported by Eita (2015); the different components of institutional quality showed varying effects on stock market performance. Six components of governance quality were applied: (i) voice and accountability, (ii) political stability and absence of violence, (iii) government effectiveness, (iv) regulatory quality, (v) rule of law and (vi) control of corruption. Government effectiveness was shown to be positively related to stock market performance in Botswana, South Africa and Zambia but was negatively related to stock market performance in Mauritius and Kenya. In terms of the control of corruption and rule of law, their results indicated that improvement in these two aspects had dampening effect on stock market performance. Furthermore, a stable political situation, the absence of violence, and voice and accountability caused positive effects on stock market performance.

The effects of institutional quality were further tested by recent studies conducted by Winful, Sarpong and Agyei-Ntiamoah (2016) and Setayesh and Daryaei (2017) based on different samples. Using data from 44 emerging countries, Winful et al. (2016) found that institutional quality positively influences stock market performance. On the other hand, using panel data from eight developing Islamic countries, Setayesh and Daryaei (2017) found that rule of law and corruption control through economic growth were positively related to the stock market turnover rate proxy. Recent studies by Boadi and Amegbe (2017) used stock returns as the proxy for stock market performance revealing that governance quality significantly affects the stock market performance. Notably, they revealed that governance quality generates different effects on stock market performance after the decomposition of countries based on income level. Among the six components of governance quality applied, only rule of law showed a significant relationship with stock indices in all countries. Specifically, rule of law showed negative impact on stock indices in high-income countries, but a positive impact in upper-middle and lower-middle income countries.

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In summary, stock market performance can be measured from different angles, including stock market development (Simplice, 2012), stock market returns (Hooper et al., 2009; Eita, 2015; Boadi & Amegbe, 2017), stock market volatility (Hooper et al., 2009; Low et al., 2011) and stock market liquidity. In addition, the ratio of stock market capitalization to gross domestic product (GDP) has been commonly used as a proxy for stock market development, whereas the ratio of stock market turnover to GDP has been used as a proxy for stock market liquidity. Datar (2000) argued that measurements of stock market capitalization and stock market turnover have certain statistical shortcomings. For instance, stock market capitalization is a stock measure taken only at a point in time, whereas stock market turnover is a flow measure measured only over a period of time. Datar (2000) also stated that a comparison between stock market capitalization and stock market turnover in feasible if the individual country is used as the sample. In one influential study, Levine and Zervos (1996) argued that a single indicator cannot provide adequate information about the performance of a particular market. More recently, Svirydzenka (2016) mentioned that the modern stock market has become multifaceted and suggested that researchers should look at multiple indicators in stock market performance evaluations.

No general consensus exists about the standard measurement to be used for stock market performance. Thus, this study aims to fill the knowledge gap by proposing a new proxy to measure stock market performance at the aggregate level. As a more comprehensive study, this study includes four stock market-related measurements and forms a new proxy to measure stock market performance. The relationship between the governance quality and new proxy of stock market performance is then tested and the methodology applied in this study is further discussed in the next section. Based on the literature review, macroeconomic factors undeniably affect stock market performance in different aspects.

DATA AND METHODOLOGY

This section started with the summary of the hypotheses tested in this study. Next, this section continues with the discussion for the data and methodology used in this study. The annual data of 14 developing countries were included in the analysis. The sample period covered 2008 to 2016. The sample countries were Argentina, Brazil, China, Indonesia, India, Korea, Sri Lanka, Mexico, Malaysia, Peru, the Philippines, Thailand, Turkey and South Africa. This sample period and these sample countries were selected due to data availability.

The hypotheses tested in this study are as follows:
H_1: Income level has a positive relationship to stock market performance.
H_2: Savings rate has a positive relationship to stock market performance.
H_3: Foreign direct investment has a positive relationship to stock market performance.
H_4: Banking sector development has a positive relationship to stock market performance.
H_{5a}: Voice and accountability have a positive relationship to stock market performance.
H_{5b}: Political stability and the absence of violence have a positive relationship to stock market performance.
H_{5c}: Government effectiveness has a positive relationship to stock market performance.
H_{5d}: Regulatory quality has a positive relationship to stock market performance.
H_{5e}: Rule of law has a positive relationship to stock market performance.
H_{5f}: Control of corruption has a positive relationship to stock market performance.

Figure 1 summarizes the proposed hypotheses of this study, which illustrate the independent variables and dependent variable used.

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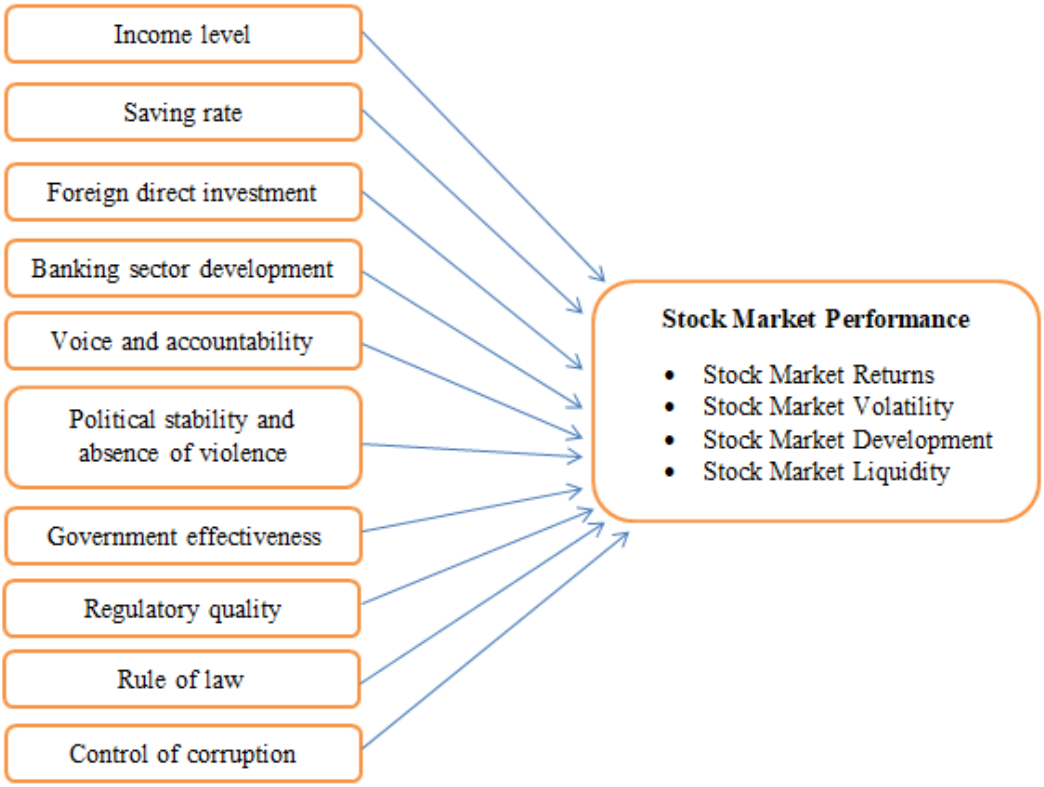

FIGURE 1. Conceptual framework of the study

DEPENDENT VARIABLES

This study's main objective is to investigate the impact of governance quality and macroeconomic factors on stock market performance. This study's dependent variable is stock market performance, which is represented by four indicators - stock market returns, stock market volatility, stock market development, and stock market liquidity. The data related to stock market returns and stock market volatility were extracted from DataStream. This study used the yearly standard deviation of stock returns to be the proxy of stock market volatility. Four simple steps have been applied in order to obtain the yearly standard deviation of stock returns. Firstly, the daily stock returns were computed by calculating the natural logarithms of the daily stock index. Secondly, the daily stock return was deducted with the average daily stock return and square the result. Thirdly, the sum of squared difference was divided by the number of trading days in year *t*. Then, the standard deviation of the stock market return was calculated by taking the square root of the results in the third step. In short, the stock market volatility of country *X* at year *t* was represented by the standard deviation of the daily returns for the period ranging from the first trading day until the last trading day of year *t*. Stock market volatility was calculated as follows:

$$\text{Yearly stock market volatility} = \sqrt{\frac{\sum_1^n (SR - \overline{SR})^2}{n}}$$

where,

SR = Daily stock returns

$\overline{SR}$ = Average daily stock returns in year *t*.

n = Number of trading days in year *t*.

Meanwhile, the data related to stock market development and stock market liquidity were extracted from the World Development Index. This study also seeks to form a new proxy for stock market performance through the combination of four indicators related to stock market performance using principal component analysis. The definitions of the five dependent variables are presented in Table 1.

TABLE 1. Definition of the dependent variables

Variable	Definition
Stock market return (*SMR*)	Natural logarithms of stock index changes in a year
Stock market volatility (*SMV*)	The yearly standard deviation of stock market returns
Stock market development (*SMD*)	Natural logarithms of yearly market capitalization of domestic listed companies.
Stock market liquidity (*SML*)	Natural logarithms of yearly stock value traded in the market.
Overall stock market performance (*SMP*)	A new proxy combining the four stock market indicators using principal component analysis (PCA)

INDEPENDENT VARIABLES

Several independent variables used in this study can be divided into macroeconomic variables and governance quality variables. The related macroeconomic data were extracted from the World Development Index, whereas the governance quality-related data were extracted from World Governance Index. The definitions of the independent variables are presented in Table 2.

Following Boadi and Amegbe (2017), this study used the six components from the World Governance Index (WGI) as the proxies for measuring countries' governance quality: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. The ratings for the WGI components ranged from -2.5 to 2.5. In order to standardized the data, this study changed the rating to a scale from 0 to 10. The rating conversion was carried out by using the following formula: [Original rating + 2.5] x 2. For instance, an original rating of -2.5 was changed to 0, an original rating of 0 was changed to 0, and an original rating of 2.5 was changed to 10.

TABLE 2. Definition of the independent variables

Variable	Definition
Income level (GDP)	Natural logarithms of gross domestic product (GDP)
Saving rate (SAV)	Natural logarithms of gross savings
Foreign direct investment (FDI)	Natural logarithms of foreign direct investment (FDI)
Banking sector development (CRE)	Natural logarithms of domestic credit provided by financial sector.
Voice and accountability (VA)	Ability of citizens to select government and freedom for expression, association and free media.
Political stability (PS)	Likelihood of the occurrence of political instability and/or politically-motivated violence, including terrorism.
Government effectiveness (GE)	Quality of public services, civil service, policy formulation and implementation; degree of independence from political pressures;
Regulatory quality (RQ)	Ability of the government to formulate and implement sound policies and regulations that permit and promote the development of the private sector.
Rule of law (RL)	Quality of contract enforcement, property rights, the police, and the courts as well as likelihood of crime and violence.
Control of corruption (CC)	Perceptions of the extent to which public power is exercised for private gain

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PRINCIPAL COMPONENT ANALYSIS

This study intends to form the proxy for overall stock market performance and governance quality by using principal component analysis. Principal component analysis (PCA) is a statistical technique to transform multiple correlated variables into a single variable by reducing the dimensionality of the multiple correlated variables (Jolliffe, 2002). Besides, Nadkarni and Neves (2018) also pointed out that the data normalization need to be done before the PCA analysis since the PCA is the variance maximization practice and the principal component tends to be affected by large values of a dataset. Before the PCA analysis, the data of stock market indicator and governance quality have been normalized using the min-max normalization to transforms the data value of stock market indicator and governance quality into a range from 0 to 1. Thereafter, PCA analysis will be carried out to determine the eigenvalue and eigenvector for the stock market indicators and the components of governance quality. The following steps will continue the calculation of the new proxies for the overall stock market performance and governance quality:

Step 1: The calculation for the product of eigenvector and eigenvalue could also be illustrated by using the following matrices:

$$\mathbf{E_{vector}} \text{ x } \mathbf{E_{value}} = \mathbf{P}$$

$$\begin{pmatrix} Y_{1,1} & Y_{1,2} & Y_{1,3} & Y_{1,4} \\ Y_{2,1} & Y_{2,2} & Y_{2,3} & Y_{2,4} \\ Y_{3,1} & Y_{3,2} & Y_{3,3} & Y_{3,4} \\ Y_{4,1} & Y_{4,2} & Y_{4,3} & Y_{4,4} \end{pmatrix} \begin{pmatrix} Z_1 \\ Z_2 \\ Z_3 \\ Z_4 \end{pmatrix} = \begin{pmatrix} P_1 \\ P_2 \\ P_3 \\ P_4 \end{pmatrix}$$

where,
Matrix Y_{vector} = Eigenvector obtained through principal component analysis.
Matrix Z_{value} = Eigenvalues obtained through principal component analysis.
Matrix P = Product of eigenvector and eigenvalues for four indicators.

Step 2: Weight allocated to each stock market indicator will be calculated as follow:

Weight for the first stock market indicator(W_1) = $\frac{P_1}{P_1+P_2+P_3+P_4}$

Step 3: Calculation for the proxy of overall stock market performance

Proxy for overall stock market performance = W_1 (SMR) + W_2 (SMV) + W_3 (SMD) + W_4 (SML)

MODEL SPECIFICATION

Data related to stock market and economy tends to be dynamic over time. In order to handle the dynamic nature of the data, two-step GMM estimation has been applied in this study to estimate the relationship between the explanatory variables (macroeconomic factors and governance quality) and stock market performance (*stock market returns*, *stock market volatility*, *stock market development,* and *stock market liquidity, overall stock market performance*). Instead of using difference GMM, this study has chosen the system GMM estimation due to its ability to handle the independent variables' endogeneity issue (Arrelano & Bover, 1995). System GMM

System GMM estimation also combines both the equation in level and equation in first difference. As a result, the efficiency of the estimated parameters can be improved. System GMM able to controls for the unobserved country specific effects by differentiating the model to exclude any country specific effects or time-invariant country specific variable (Matemilola et al., 2015). However, the efficiency of system GMM relies on the validity of the additional moment's condition. It was worth noting that system GMM also used the efficient instrumental variable techniques to solve the endogeneity issue by reversing the causality problem between variables (Bani, 2017). Meanwhile, there are two alternatives to system GMM estimation, namely one-step GMM estimation and two-step GMM estimation (Labra & Torrecillas, 2018). This study selected the two-step GMM estimation since the consistent estimate of the covariance matrix has been used to weighs the moment conditions. This makes two-step GMM estimation found to be more efficient as compared to one-step estimator (Windmeijer, 2005). In addition, two-step GMM estimation was also the common practice to make the GMM estimator more efficient (Hwang & Sun, 2018).

The empirical model for the determinant of stock market performance is as follows:

$$Return_{i,t} = \alpha_i + \beta_0\, Return_{i,t-1} + \beta_1 \ln GDP_{i,t} + \beta_2 \ln SAV_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln CRE_{i,t} + \beta_5 \ln GQ_{i,t} + \epsilon_{i,t} \quad (1)$$

$$Volatility_{i,t} = \alpha_i + \beta_0\, Volatility_{i,t-1} + \beta_1 \ln GDP_{i,t} + \beta_2 \ln SAV_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln CRE_{i,t} + \beta_5 \ln GQ_{i,t} + \epsilon_{i,t} \quad (2)$$

$$Dev_{i,t} = \alpha_i + \beta_0\, Dev_{i,t-1} + \beta_1 \ln GDP_{i,t} + \beta_2 \ln SAV_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln CRE_{i,t} + \beta_5 \ln GQ_{i,t} + \epsilon_{i,t} \quad (3)$$

$$Liquidity_{i,t} = \alpha_i + \beta_0\, Liquidity_{i,t-1} + \beta_1 \ln GDP_{i,t} + \beta_2 \ln SAV_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln CRE_{i,t} + \beta_5 GQ_{i,t} + \epsilon_{i,t} \quad (4)$$

$$Overall_{i,t} = \alpha_i + \beta_0\, Overall_{i,t-1} + \beta_1 \ln GDP_{i,t} + \beta_2 \ln SAV_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln CRE_{i,t} + \beta_5 \ln GQ_{i,t} + \epsilon_{i,t} \quad (5)$$

where
$Return_{i,t}$ represents the stock market return of country *i* at time *t*,
$Volatility_{i,t}$ represents the stock market volatility of country *i* at time *t*,

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$Dev_{i,t}$ represents the stock market development of country *i* at time *t*,
$Liquidity_{i,t}$ represents the stock market liquidity of country *i* at time *t*,
$Overall_{i,t}$ represents the new proxy for stock market performance of country *i* at time *t*,
$GDP_{i,t}$ represents the gross domestic product of country *i* at time *t*,
$Sav_{i,t}$ represents the saving rate of country *i* at time *t*,
$FDI_{i,t}$ represents the foreign direct investment of country *i* at time *t*,
$CRE_{i,t}$ represents the domestic credit provided by financial sector in country *i* at time *t*,
$GQ_{i,t}$ represents the new proxy for governance quality of country *i* at time *t*.

This study followed the suggestion provided by Blundell and Bond (1998) and applied the specification tests, namely Sargan tests for over-identification to check the instruments' validity. The null hypothesis under the Sargan test are as follows:

H_0: All the restriction of over-identification was valid.

The inclusion of lagged dependent variable in the model shall lead to the autocorrelation. Hence, another assumption that stated that first-order serial correlation was expected, but not second-order serial autocorrelation to maintain the consistency of GMM estimation (Winful, Sarpong & Agyei-Ntiamoah, 2016). The null hypothesis under the autocorrelation was the absence of serial correlation.

The natural logarithms for all the variables have been obtained before running the two-step system GMM estimation. In the first step, there is an assumption that the error terms are independent and homoscedastic across the sample countries and periods. In the second step, the residuals generated from the first step are used to construct consistent estimation for the variance-covariance matrix. Hence, the assumption of independent and homoscedasticity are relaxed. Besides Since there is an expectation of first-order serial correlation, the lagged dependent variable is included in the empirical model.

RESULTS AND DISCUSSION

This section presents the results of the study. Table 3 presents the descriptive statistics of four dependent variables over the sample period 2008 - 2016. As reported in Table 3, Argentina had the highest stock market returns, as well as the highest stock market volatility, whereas China had the lowest stock market returns, and Malaysia had the lowest stock market volatility. As for the measurement of stock market development, South Africa's stock market had the largest market capitalization, followed by Malaysia and Korea. However, China was the most liquid market among the 14 countries included in this study, followed by Korea and India. This study also develops a new proxy to measure the overall stock market performance, and the Philippines had the best stock market performance, followed by Mexico and Korea.

Table 4 presents the descriptive statistics of ten independent variables over the sample period 2008 - 2016. Korea had the highest GDP per capita, followed by Argentina and Turkey. As one of the greatest economic system in the world, China undoubtedly had the highest gross savings, foreign direct investment and banking sector development. Table 4 also shown that as well as domestic credit provided. As for governance quality, Korea had the highest rating of 11.7146, followed by South Africa and Argentina.

TABLE 3. Descriptive statistics of dependent variables

Country		Stock Market Return	Stock Market Volatility	Stock Market Development	Stock Market Liquidity	Overall Performance
Argentina	Mean	0.2259	0.0205	10.7386	0.5604	28.5320
	S.D	0.4745	0.0043	2.6955	0.2069	9.8572
Brazil	Mean	-0.0097	0.0168	47.4352	32.5677	42.1499
	S.D	0.3258	0.0061	17.2878	6.2212	16.2849
China	Mean	-0.0589	0.0157	55.6272	137.0407	37.4046
	S.D	0.4655	0.0063	13.7480	89.2028	16.6845
Indonesia	Mean	0.0727	0.0127	40.6363	11.5592	54.7874
	S.D	0.3675	0.0049	9.2774	2.2105	10.1406
India	Mean	0.0232	0.0127	72.8598	47.9445	37.1725
	S.D	0.4169	0.0062	16.3735	21.0378	16.8393
Korea	Mean	0.0063	0.0115	86.3321	131.5871	57.6760
	S.D	0.2507	0.0059	15.6689	30.1192	16.0676
Sri Lanka	Mean	0.0992	0.0080	25.2023	3.6642	41.9794
	S.D	0.4143	0.0029	6.7804	2.5781	22.7558
Mexico	Mean	0.0474	0.0113	36.6716	9.7850	59.9798
	S.D	0.1772	0.0051	6.9521	1.5604	11.5997
Malaysia	Mean	0.0131	0.0067	134.1662	40.0705	43.6987
	S.D	0.2356	0.0027	23.1915	4.0566	11.5435

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Peru	Mean	-0.0151	0.0141	45.9174	2.1461	37.4086
	S.D	0.5068	0.0069	13.1200	0.8221	15.0711
Philippines	Mean	0.0697	0.0118	73.0528	12.1499	63.1469
	S.D	0.3269	0.0039	20.0926	2.9718	14.6829
Thailand	Mean	0.0652	0.0118	81.5505	63.5683	56.1393
	S.D	0.3370	0.0043	22.6004	15.6734	16.2702
Turkey	Mean	0.0351	0.0160	26.2457	40.7094	45.3391
	S.D	0.4170	0.0048	8.5181	7.1403	21.4290
South Africa	Mean	0.0992	0.0116	242.0505	74.6908	45.0623
	S.D	0.4143	0.0047	45.3456	24.1933	15.8809

Notes: *Stock market return* = natural logarithms for the changes of stock index of country *i* in year *t*. *Stock market volatility* = standard deviation of the stock market returns. *Stock market development* = natural logarithms of market capitalization of domestic listed companies. *Stock market liquidity* = natural logarithms of stock value traded in the market. *Overall performance* = new proxy constructed by using principal component analysis to measure the stock market performance. *S.D* = standard deviation

TABLE 4. Descriptive statistics of independent variables

Country		IL	SAV	FDI	CRE	GQ
Argentina	Mean	9.3430	2.8018	0.5145	3.4087	10.6886
	S.D	0.1826	0.1328	0.5319	0.2122	0.3972
Brazil	Mean	9.2568	2.7933	1.0257	4.5883	10.6060
	S.D	0.1824	0.1220	0.2657	0.0827	0.5070
China	Mean	8.6701	3.9042	1.2266	5.0490	5.5534
	S.D	0.3243	0.0366	0.3039	0.1800	0.1373
Indonesia	Mean	8.0694	3.3695	0.5274	3.6872	8.5651
	S.D	0.1821	0.1985	0.6135	0.1348	0.6260
India	Mean	7.2360	3.5431	0.6801	4.3172	8.1020
	S.D	0.1794	0.0778	0.3101	0.0345	0.3647
Korea	Mean	10.0841	3.5385	-0.2682	5.0677	11.7146
	S.D	0.1449	0.0314	0.3896	0.0383	0.3143
Sri Lanka	Mean	8.0432	3.2896	0.1528	3.9590	7.5145
	S.D	0.2553	0.1770	0.2620	0.2465	1.5951
Mexico	Mean	9.1388	3.1415	0.9032	3.8434	8.2676
	S.D	0.1015	0.0588	0.2961	0.1254	0.2979
Malaysia	Mean	9.1721	3.4520	0.8386	4.8796	9.1779
	S.D	0.1368	0.1050	1.4038	0.0885	0.3088
Peru	Mean	8.6230	3.0735	0.5059	3.0802	8.5446
	S.D	0.1796	0.0623	0.3182	0.1650	0.8614
Philippines	Mean	7.7981	3.8070	0.2330	3.9693	6.9304
	S.D	0.1826	0.0360	0.5042	0.0963	1.0364
Thailand	Mean	8.5910	3.3681	0.6879	5.0079	5.9806
	S.D	0.1401	0.0672	0.6906	0.1280	0.3339
Turkey	Mean	9.3132	3.1432	0.4671	4.2283	6.6654
	S.D	0.0943	0.0571	0.2558	0.1327	1.1746
South Africa	Mean	8.7710	2.8060	0.2900	5.0018	10.8606
	S.D	0.1433	0.0735	0.6328	0.0338	0.1471

Notes: *IL* = natural logarithms of gross domestic product per capita, *SAV* = natural logarithms of gross domestic savings, *FDI* = natural logarithms of foreign direct investment, *CRE* = natural logarithms of domestic credit provided by financial sector, *GQ* represents the governance quality, *Mean* = average of the particular data, *S.D* = standard deviation

Table 5 shown that Stock Market Development (SMD) had the highest weight of 0.3373 in proxy for overall stock market performance, followed by Stock Market Liquidity (SMR), Stock Market Return (SMR), and Stock Market Volatility (SMV). It is worth noting that SMD and SMR had a high impact on overall stock market performance. On the other hand, Table 6 shown that political stability had the highest weightage of 0.5855 for the proxy of governance quality. This study indicated that political stability had the highest impact on the governance quality of a country.

TABLE 5. Eigenvector and eigenvalue of the stock market indicator (PCA Analysis)

Stock Market Indicator	SMD	SML	SMR	SMV
Eigenvector	0.6660	0.1499	-0.1405	0.7171
	0.5466	0.5335	-0.0967	-0.6382

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	-0.2879	0.6953	0.6124	0.2420
	0.4181	-0.4575	0.7719	-0.1415
Eigenvalue	1.8804	1.1667	0.7086	0.2444
Product of Eigenvector and Eigenvalue	1.5029	1.4257	0.7629	0.7648
Weightage	0.3373	0.3199	0.1712	0.1716

Notes: *SMD* = stock market development, *SML* = stock market liquidity, *SMR* = stock market return, *SMV* = stock market volatility

TABLE 6. Eigenvector and eigenvalue of the governance quality components (PCA Analysis)

Governance Quality Component	VA	PS	GE	RQ	RL	CC
Eigenvector	0.1794	0.9323	-0.1775	-0.0243	0.2480	-0.0702
	0.3687	0.1057	0.8635	0.1613	0.0491	0.2808
	0.4559	-0.3060	-0.0068	-0.1775	0.6633	-0.4764
	0.4294	-0.1308	-0.4031	0.7411	0.0476	0.2908
	0.4579	-0.0779	-0.2457	-0.6265	-0.1158	0.5639
	0.4796	0.0523	0.0045	-0.0116	-0.6931	-0.5355
Eigenvalue	3.7782	0.9132	0.6140	0.3222	0.2003	0.1121
Product of Eigenvector and Eigenvalue	0.6778	0.8514	-0.1090	-0.0078	0.0497	-0.0079
Weightage	0.4661	0.5855	-0.0749	-0.0054	0.0342	-0.0054

Notes: *VA* = voice and accountability, *PS* = political stability, *GE* = government effectiveness, *RQ* = regulatory quality, *RL* = rule of law, *CC* = control of corruption

TABLE 7. Results of System GMM Estimation with Laglimits and Collapse)

Variables	Model 1: *Stock Market Return*	Model 2: *Stock Market Volatility*	Model 3: *Stock Market Development*	Model 4: *Stock Market Liquidity*	Model 5: *Overall Performance*
Lagged dependent	0.1828 (0.000)***	-0.1828 (0.000)***	0.2654 (0.000)***	0.8489 (0.004)***	0.2525 (0.018)**
SAV	0.0470 (0.792)	-0.0539 (0.152)	-0.1878 (0.140)	-0.6363 (0.365)	-21.3043 (0.167)
CRE	-1.0443 (0.230)	-0.6848 (0.000)***	0.7163 (0.755)	0.6071 (0.268)	5.1428 (0.457)
FDI	-0.0189 (0.448)	-0.0249 (0.926)	0.3384 (0.360)	-0.2686 (0.215)	-1.3399 (0.192)
IL	-0.8351 (0.121)	-0.1159 (0.000)***	-0.6786 (0.058)*	-0.5305 (0.000)***	-22.1877 (0.243)
GI	0.0724 (0.530)	-0.0146 (0.018)**	0.3335 (0.045)**	0.0447 (0.002)***	1.7530 (0.101)
Constant	11.2454 (0.000)***	9.1682 (0.000)***	9.4256 (0.079)*	3.8809 (0.971)	34.3087 (0.161)
Sargan	10.2983 (0.1126)	11.6267 (0.1718)	9.0913 (0.1685)	11.1085 (0.1851)	11.2583 (0.8071)
1st order	-2.4939 (0.0126)**	-2.9756 (0.0029)***	-1.8137 (0.0697)*	-1.0198 (0.0308)**	-1.2723 (0.0203)**
2nd order	1.2115 (0.2257)	2.6277 (0.8600)	0.7684 (0.4423)	1.2526 (0.2104)	-1.4223 (0.6728)

Notes: ***, ** and * denotes significance at the 1%, 5% and 10% levels, respectively. $SAV_{i,t-1}$, $CRE_{i,t-1}$, $FDI_{i,t-1}$, $IL_{i,t-1}$, and $GI_{i,t-1}$ are used as instruments. The number of instruments for Model 1 to 5 are 13. In order to avoid the instrument proliferation problem. The number of instruments has been reduced through the laglimits and collapse.

Table 7 presents the results of the System GMM Estimation with laglimits and collapse. Four stock market indicators has been combined to form a new proxy for stock market performance by using principal component analysis. Then, the four stock market indicators and the new proxy for stock market performance were used as the dependent variables

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in the analysis. Meanwhile, six components of the World Governance Index have been combined to form a new proxy for the governance quality. As reported in Table 7, none of the independent variables had a significant relationship with the stock market return and overall performance (Model 1 and 5). This indicated that stock market returns and overall stock performance of developing countries cannot be affected either by the macroeconomic factor or governance quality. Contradict with the previous findings of Gan et al. (2006) and Cherif and Gazdar (2010), this study found that income level showed a negative relationship with the stock market volatility, stock market development and stock market liquidity (Models 2 to 4). An increase of 1% in income level reduces stock market volatility, stock market development and stock market liquidity by 0.1159, 0.6786 and 0.5305 units, respectively. This indicated that the income of the developing countries cannot be transmitted efficiently into the stock market. Consequently, higher incomes of developing countries shall lead to lower stock trading (*stock market liquidity*) and smaller stock market size (*stock market development*). However, this finding was consistent with the previous study Bayraktar (2014) who revealed the negative relationship between the income level and stock market development. The researcher also pointed out an example to further explain the discrepancy. For instances, Luxembourg had the highest GDP per capita but low stock market capitalization. The high GDP per capita was mainly due to the small population in Luxembourg. This also indicate that GDP per capita may not be an appropriate proxy for income level. In addition, under Model 2, banking sector development and governance quality also showed significantly and negatively impact on the stock market volatility in developing countries. An increase of 1% in the banking sector development and proxy of governance quality reduces stock market volatility by 0.6848 and 0.0146 units, respectively. The results obtained showed that higher banking sector development and better governance quality helps to stabilize the stock markets of the developing countries. In addition, the governance quality also showed a positive relationship with the stock market development and stock market liquidity. Consequently, a better governance quality and stable stock market also helps attract the capital inflow from foreign investors and helps to grow a particular stock market. Lastly, the result of the Sargan test showed that instruments were valid, and the estimation model showed the high predictive power. The results of autocorrelation showed that there is an absence of first order serial correlation (AR1) and the presence of second order serial correlation (AR2).

CONCLUSION

This study aims to examine the relationship between governance quality and stock market performance by using the annual data of fourteen developing countries over the period 2008 to 2016. This study employed the two-step system GMM estimation to examine the impacts of macroeconomic variables and governance quality on stock market performance. Unlike previous studies, this study tested the impacts of macroeconomic variables and governance quality on four different aspect of stock market performance and the overall stock market performance. Hence, the dependent variables used in this study were stock market return, stock market volatility, stock market development, stock market liquidity, and overall stock market performance. Whereas, the independent variables used in this study were savings rate, banking sector development, foreign direct investment, income level and governance quality.

The results showed that higher banking sector development and income level negatively associated with stock market volatility. Developing countries should focus in improving the banking sector and income level, in order to reduce the fluctuation in stock market movements. In addition, this study revealed that the higher rating of governance quality tends to reduce stock market volatility. Intuitively, developing countries usually linked with the lower governance quality. Developing countries should also focus in improving governance quality to enhance the countries' reputation. Thus, several policies should be implemented by developing countries to enhance the quality of public services, the level of independence from political pressure and controlling in corruption level. Indirectly, enhancement in the governance quality of a country tend attracts more investors, which in turn boost up the stock market performance.

The findings of this study contribute to the existing literature and could have interesting policy implications. This study provides the comprehensive view on the impact of macroeconomic variables and governance quality towards the stock market performance. Developing countries should strengthen the position of banking sectors and generate higher income. By strengthening the banking sector, more funds can be channel into the stock market. Subsequently, stock market shall develop well, becomes more liquid and less volatile. Besides that, this study also highlights the importance of governance quality in affecting the stock market and recommends that sample countries with lower governance quality ratings enhance their political environment. This can be done through the enhancement of the six different components of WGI, which included the voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption.

SAMPLE PROOF

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