

A Service of

ZBW

Leibniz-Informationszentrum Wirtschaft Leibniz Information Centre for Economics

Mensah, Gideon; Osei-Fosu, Anthony Kofi; Asante, Grace Nkansah

Article

The Effects of Public Sector Management and Institutions on Stock Market Development in Sub- Saharan Africa

Cogent Economics & Finance

Provided in Cooperation with:

Taylor & Francis Group

Suggested Citation: Mensah, Gideon; Osei-Fosu, Anthony Kofi; Asante, Grace Nkansah (2022) : The Effects of Public Sector Management and Institutions on Stock Market Development in Sub-Saharan Africa, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 10, Iss. 1, pp. 1-22, https://doi.org/10.1080/23322039.2022.2109278

This Version is available at: https://hdl.handle.net/10419/303742

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.



https://creativecommons.org/licenses/by/4.0/

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.









Cogent Economics & Finance

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/oaef20

The Effects of Public Sector Management and Institutions on Stock Market Development in Sub-Saharan Africa

Gideon Mensah, Anthony Kofi Osei-Fosu & Grace Nkansah Asante

To cite this article: Gideon Mensah, Anthony Kofi Osei-Fosu & Grace Nkansah Asante (2022) The Effects of Public Sector Management and Institutions on Stock Market Development in Sub- Saharan Africa, Cogent Economics & Finance, 10:1, 2109278, DOI: 10.1080/23322039.2022.2109278

To link to this article: https://doi.org/10.1080/23322039.2022.2109278

9

© 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.



Published online: 21 Aug 2022.

گ

Submit your article to this journal 🕝

Article views: 855

Q	,
	•

View related articles \square



View Crossmark data 🗹



Citing articles: 2 View citing articles 🕝





Received: 02 November 2021 Accepted: 30 July 2022

*Corresponding author: Gideon Mensah, Department of Economics, Kwame Nkrumah University of Science and Technology, Ghana E-mail: mensahgideon102@gmail.com

Reviewing editor: David McMillan, University of Stirling, Stirling, UK

Additional information is available at the end of the article

FINANCIAL ECONOMICS | RESEARCH ARTICLE

The Effects of Public Sector Management and Institutions on Stock Market Development in Sub-Saharan Africa

Gideon Mensah^{1*}, Anthony Kofi Osei-Fosu¹ and Grace Nkansah Asante¹

Abstract: Recently, sub-Saharan Africa (SSA) stock markets have received an exceptional attention as a market of hope and future. Hence, policy-makers, investors and financial analysts have been striving to ameliorate the factors that are detrimental to stock market development in SSA. Given this, the primary focus in literature has been based on the role that institutions play in influencing stock market development in SSA. Hence, this study employed fixed and random effect estimations technique on a balanced panel data of six (6) selected SSA countries to explore the impact of public sector management and institutions on stock market development in SSA for the period 2005–2018. This study found that, on average, countries with quality public sector management and institutions have been able to improve on their stock market development compared with countries without quality public sector management and institutions. In disaggregating the impact of public sector management and institutions into West and East countries in SSA, the study further demonstrated that public sector management and institutions enhance stock market development in these countries in SSA. However, we found that the effect of public sector management and institutions is insignificant in the

ABOUT THE AUTHORS

Gideon Mensah holds Master of Philosophy in Economics from the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. He is currently a graduate and research assistant at the Department of Economics, KNUST. His research interests include macroeconomics, international economics, monetary economics, environmental economics and financial economics.

Anthony Kofi Osei-Fosu is an Associate Professor in Economics at the Department of Economics, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. He holds Bachelor of Arts degree in Social Sciences with specialization in Economics and Geography. He also holds MA in Economics and PhD in Economics from the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. He has also obtained Postgraduate Diploma in International Studies from the John Hopkins University, the School of Advanced International Studies (SAIS), Bologna Centre in Italy, and Postgraduate Diploma in Education, with specialization in Economics from the University of Cape Coast in Cape Coast. His areas of specialization are in Quantitative Economics, Monetary Economics, Public Sector Economics, and Poverty Reduction and Development. He has published number of peer review journal articles on microfinance, poverty and development in high class journals.

Grace Nkansah Asante is an associate professor at the Department of Economics of the Kwame Nkrumah University of Science and Technology (KNUST) Kumasi Ghana. She has been teaching for eleven years. Currently she is teaching introductory courses to economics, Economy of Ghana, Economic Policy Analysis and Financial Markets and Institutions. Her research interest is in economic policy issues, finance and monetary issues. Prior to her position at the KNUST, she was a research officer at the Governance Division of the African Development Bank in Abidjan. She has also been a public administrator posted at the Kumasi Metropolitan Assembly. She holds a PhD in Economics from KNUST, a master's degree from the University of Ghana Legon. Her areas of research have been Finance and economic policy issues





East Africa communities (EACs). Based on these results, the study recommends that governments in SSA should put in place stringent measures that seek to enhance public sector management and institutions within SSA countries.

Subjects: Macroeconomics; Finance; Corporate Finance; Investment & Securities

Keywords: Public sector management and institutions; stock market development; sub-Saharan Africa; fixed and random effect

1. Introduction

The role played by stock market in an economy cannot be underestimated. It has been argued theoretically that stock market facilitates savers (households) to tie up their investment for longer period so as to smooth out their consumption path. It also aids firms to raise safe and reliable long- term funds by just issuing securities to expand their businesses. In addition, the secondary market of the stock market also provides an alternative means through which investors can comfortably, easily and quickly transform their non-cash asset to cash (Adelegan, 2008; Aluko & Kolapo, 2020; Bekaert et al., 2005; Ofori-Abebrese et al., 2016). The empirical study by Kenton (2019) points to the fact that, stock market is a platform where buying, selling and issuance of company's shares take place; hence the strength of the financial market depends largely on the functionality of the stock market.

It is hypothesized that, following the world financial crisis in late 1980s and early 1990s, most governments in sub-Saharan Africa (SSA) has implemented key structural measures and policies as stipulated by IMF and the World Bank to ensure financial deepening. Some of these measures were interest rate liberalization, money and stock markets integration, removal of credit ceiling, and privatization and restructuring of state- owned banks (Ofori- Abebresse, 2016; Otchere et al., 2017; Tahari et al., 2007). It is reported that the aforementioned measures in SSA were viewed to ensure a common trading platform which was intended to bring about a greater efficiency, attract foreign capital flows and enhance risk sharing and portfolio diversification (Adelegan, 2008; Yartey, 2010).

Broadly speaking, stock market development is important in SSA as majority of firms are exclusively equity financed (Aluko & Kolapo, 2020; Ngare et al., 2014). A study by Yartey and Adjasi (2007) indicate that equity finance in Nigeria is about 40% of the total Asset of the listed firms for the period 1990 and 2000, 12% in Ghana between the periods 1995 to 2002 and 25% in Zimbabwe for the periods 1990–1999. Some scholars have also shown that well-developed stock market reduces firms over reliance on bank loans, offers a new financing channel for firms to sell part of their equity to foreign investors and reduces asymmetric information (Henry, 2000; Ofori-Abebrese et al., 2016; Tachiwou, 2010). In addition, Twerefou et al. (2019) and Ngare et al. (2014), for instance, asserted that equity markets growth has a positive significant impact on aggregate growth in SSA whereas Tachiwou (2010) also documents that stock markets development is a key component for growth in West African monetary union. In Ghana, Ofori-Abebrese et al. (2016) also revealed that stock market performance enhances private investment.

Despite these, data from Africa Development Indicators Database shows that the major metric of stock market development¹ in SSA has had a poor record. For the years 1995, 1996 and 1997, the average growth in stock market capitalization was 18%, 15% and 11%, respectively. In 2017, stock market capitalization as a percentage of GDP decreased by 22%, which was nearly about 11 percentage points less than the values recorded in the late 1990s.

In terms of the individual countries in SSA, it is clear that, with the exception of South Africa, which has had a considerable and consistent increase in stock market capitalization, the remaining countries have had a terrible result. Ghana, Kenya, Morocco, Nigeria, and Zimbabwe, for example, had stock market capitalizations of 10.98, 30.34, 59.96, 16.09 and 112.91 in 2012, compared to

a 2006 peak of 15.83, 50.56, 75.20, 22.56 and 487.82 (GFDB, 2020). Adding to this, a body of research (Adelegan, 2008; Ngare et al., 2014) has also reported that stock markets in SSA countries are underdeveloped and illiquid despite the significant effort.

Given the insights from the above, the intellectual way of designing a more comprehensive policy to enhance stock market development in SSA, calls for an urgent attention to scrutinize such underpinning factors. With this, previous studies (Aluko & Kolapo, 2020; Mujtaba & Arshad, 2020; Guzmán et al., 2020) have attributed the poor performances of SSA stock markets to factors like governance quality, macroeconomic factors, financial intermediary development, institutional quality, environmental issues, corruption, political risk and trade openness, and have recommended that policies and instruments by governments aimed at stabilizing these aforementioned factors would strengthen the SSA stock markets.

However, empirical evidence still shows that stock markets in SSA countries have not gained the requisite improvement needed to foster growth and development (Farid, 2013; Ngare et al., 2014). As a result, it can be construed that all the contributing factors highlighted in the past studies (Humpe & Macmillan, 2009; Aluko & Kolapo, 2020; Mujataba & Arshad, 2020; Guzman et al., 2020) are not exhaustive lists of key factors that influence stock market dynamics in SSA. Hence, given the public sector's mediation function, can public sector management and institutions (PSMI) serve as a contributing factor in SSA stock market? or is SSA stock markets lacking support from the public sector? The rationale for undertaking this study stems from the fact that answers to these concerns cannot be appraised solely on theoretical grounds without any empirical evidence.

A study conducted by Modigliani &Miller (1963) discovered that government's imprudent borrowing and increased business taxes have negative repercussions on corporate earnings and dividends paid to shareholders, and these cause stock markets to be distorted. The public sector management and institutions cluster also includes both the actions of government² and other institutional variables.³ However, previous studies in SSA (Aluko & Kolapo, 2020; Manasseh et al., 2017; Ofori-Abebrese et al., 2016; Schmukler & Levine, 2003) has ignored this crucial feature in their analysis. As a result, it is imperative to consider how PSMI influence stock market development in SSA.

In doing so, we contribute to a body of literature, especially in SSA in three diverse ways. First, we assess how the quality of PSMI influences stock market development in SSA. Second, scholars (Imran et al., 2020; Asongu, 2012; Aduda et al., 2012) have tested the individual effect of institutional variables on stock market development, but they have failed to capture how quality of budgetary and financial management, efficiency of revenue mobilization and quality of public administration could affect stock market development. Meanwhile, changes in government actions or policies are thought to have an impact on how well economic actors achieve their business goals and objectives in the economy. As a result, it is critical to understand how each component of PSMI impacts on stock development in SSA.

Finally, this study also aims to disaggregate the influence of the PSMI into West and East Africa, in order to examine if the effects of the PSMI cluster differ across SSA. Disaggregating the impact of PSMI index into West and East Africa will help identify the countries that have weak PSMI within SSA so as to institute stringent measures to revamp their PSMI.

The rest of the paper is organized as follows. The next section of this study discusses a review of pertinent empirical literature. Section three also focuses on the methodological framework this paper employed. It discusses the theoretical and empirical model specification, data sources and methods used in analyzing the data. The fourth section of this paper is devoted to the discussion of the empirical findings, and the final section contains a summary and closing remarks.

2. Literature review

On the empirical front, studies on the importance of institutions in deepening stock market point to the fact that better institutions ensure a sustainable business environment for the private sector to strive optimally. For example, Liang et al. (2021) tested the impact of leverage effect on 21 international equity indices and reported that leverage effect has a positive significant effect on equity indices. Imran et al. (2020) also sampled 25 countries from developed economies for the period 1996–2008, and concluded that better institutions ensure effective implementation of laws which improves investor's confidence and enhances stock market performance. In controlling for the effect of PSMI, Emudainohwo (2020) assessed the impact of International Financial Reporting Standards (IFRS) on stock exchange development in SSA. Employing logistic estimation technique, it was revealed that PSMI improves business environment and hence, have a high degree of comovement with stock exchange development in SSA.

Employing autoregressive distributed lag (ARDL) model on a quarterly data from 1997Q1 to 2016Q4, Mujataba & Arshad (2020) showed that poor institutions have a negative repercussion on stock market development in Pakistan. Interestingly, Canh et al. (2018) also found a positive co-movement between institutional quality and European emerging stock markets for the period 2002 to 2015. The study by El Ouadghiri et al. (2021) also augment the view that conducive business environment in the form of proper government regulations has a significant positive effect on weekly stock returns in US. Using autoregressive distributed lag (ARDL) model, Manasseh et al. (2017) also reported that better institutions have a positive and significant effect on stock market development in Nigeria.

In Ghana, Ofori-Abebrese et al. (2016) also investigated the impact of macroeconomic policy on the development of the Ghana Stock Exchange for the period 1991–2011. The study showed that government expenditure impacts positively on stock market development in Ghana whereas government revenue has a negative significant effect on stock market development. Accordingly, Eldomiaty et al. (2016) empirically examined the effect of institutional quality on stock market volatility in the MENA region. Employing institutional and macroeconomic data covering the period from 1996 to 2014, the outcome from the study revealed that government spending has a positive significant effect on stock market development in the MENA regions.

On the same trend, the events study by Ho & Iyke (2017) also demonstrated that stock market development is influenced by two factors: macroeconomic factors and institutional factors. It was however observed from the study that variations in legal origins among countries have different impacts on stock market growth. Sampling 21 countries from emerging markets and 24 from developed markets with a complete data for the period January, 2002 to December, 2009, Low et al. (2015) showed that governance quality is a key driver for equity market growth. Also, Asongu (2012) instrumented government quality with legal origins to scrutinize the determinants of stock market performance in Africa. Employing a panel data spanning from 1990 to 2010, the results suggest that better institutions have a significant positive effect on stock market performance in Africa. Similarly, Chinn & Ito (2006) also studied the link between institutional performance and financial market growth using a panel dataset comprising 108 countries in the emerging market economies. The study revealed that financial opening fosters equity market development only if the threshold level of institutions is attained.

Applying generalized method of moments (GMM) on a balanced panel data from 1990 to 2004, Yartey (2010) revealed that better institutions are important determinants of stock market development in emerging market economies. Employing asset pricing models, Hooper et al. (2009) modelled the link between quality of institutions and global stock markets performance. Their regression output showed that institutional quality impacted positively on stock market growth. In the study, they observed that countries that have well developed institutions tend to have stock markets that yield higher equity returns and lower associated risk level. Lastly, using a sample of thirteen (13) stock markets in SSA countries for the period 1990 to 2007, Adelegan (2008) examined the impacts of regional cross- listings on stock market performance by applying fixed effects and generalized method of moments (GMM) estimator in the analysis of the dataset. The study found that sound legal and regulatory frameworks are key elements that stimulate stock market growth in sub-Saharan Africa countries.

It is observed from the empirical literatures reviewed that the primary focused in literature has been based on the role that institutions play in influencing stock market development (see: Imran et al., 2020; Mujataba & Arshadl., 2020; Manasseh et al., 2017; El Ouadghiri et al., 2021). It is only Emudainohwo (2020), who has controlled for the effect of PSMI dynamics on stock exchange development in SSA, where he assumed that stock market development took on two values: 1- if a stock exchange is formed in the observed country and 0—otherwise. However, for practical policy considerations, this analysis does not show a clear influence of PSMI on stock market development in SSA. As a result, a thorough assessment of how public sector management and institutions influenced stock market development in SSA is required for more comprehensive policy implications in the region.

3. Methodology and data

This section of the study explains the methodological framework this study adopted in the analysis of the dataset. It is composed of four sub-sections. The first section contains theoretical and empirical model specification. The next section is the estimation strategy and the diagnostic test procedures. The third section identifies the source of the data on the variables used whereas the last section describes the stationarity tests this study applies to determine the order of integration of the sample variables.

3.1. Theoretical framework and model specification

Calderon-Rossell (1991) propounded a basic theoretical model that considers output growth and market liquidity as the main determinants of stock market development. In the model, stock market development was proxied by stock market capitalization and is computed as;

$$Y = PV \tag{1}$$

Where Y indicates stock market development in SSA, V and P represent the number of listed companies in the domestic stock exchange and the average price of stocks in the local currency, respectively. According to this basic model, the average price of stocks (P) depends on output growth in the economy (usually measured as per capita GNP) and the number of listed companies (V). On the other hand, the number of listed companies (V) is also a function of the average price of stocks (P) and the liquidity of financial assets available for transactions in the capital market. Given this, the model can formally be presented as;

$$Y = PV = f(EG, T)$$
⁽²⁾

$$V = V(P,T), P = P(EG,V)$$
(3)

Where Y, P and V are already defined in Equation (1), EG and T denotes economic or output growth and turnover ratio (market liquidity) accordingly. From Equations (2) and (3), the exogenous variables are EG and T, whereas the endogenous variables are Y, P and V. With this, the structural equations of the variables presented in Equations 2 and 3 can be expressed in the reduced behavioral form as;

$$lnY = \partial_1 lnEG + \partial_2 lnT \tag{4}$$

$$lnP = \theta_1 lnEG + \theta_2 lnT$$
(5)

$$\ln V = \alpha_1 \ln E G + \alpha_2 \ln T \tag{6}$$

It must be noted that ∂_1 , θ_1 and α_1 measures the sensitivity of output growth to stock market development, average price of stocks and the number of listed companies in the domestic stock exchange, respectively. Similarly, ∂_2 , θ_2 and α_2 also measures the sensitivity of market liquidity to the later variables already mentioned above.

Combining Equations (5) and (6), Equation (7) can be written as:

$$\ln Y == \theta_1 \ln EG + \theta_2 \ln T + \alpha_1 \ln EG + \alpha_2 \ln T$$
(7)

Factoring out the like terms in Equation (7) produces a result being stated in Equation (8),

$$lnY = (\theta_1 + \alpha_1)lnEG + (\theta_2 + \alpha_2)lnT$$
(8)

$$\varphi_1 = \theta_1 + \alpha_1 \tag{9}$$

$$\varphi_2 = \theta_2 + \alpha_2 \tag{10}$$

Substituting Equations (9) and (10) into (8) yields:

$$\ln Y = \varphi_1 \ln E G + \varphi_2 \ln T \tag{11}$$

where φ_1 and φ_2 reflects the sensitivity of output growth and market liquidity on stock market development in SSA. Equation (11) shows the basic Calderon– Rossell model, which states that output growth and market liquidity are the only relevant variables that influence stock market development. However, Yartey (2008) modified this basic model and argued on the premises that other macroeconomic and institutional variables have great influence on stock market development since the actions of governments affect financial policies and regulations. Hence, this study also assumes that other financial, institutional and macroeconomic factors such as banking sector development, gross domestic savings, public sector management and institutions, exchange rate and inflation influence stock market development through market liquidity in SSA [ie., T= f(BSD, GDS, PSMI, EXR, INFL)]. Thus, the study expresses Equation (11) in a general functional form as:

$$Y = f(EG, BSD, GDS, PSMI, EXR, INFL)$$
(12)

where Y and EG are explained in the previous equations. BSD, GDS, PSMI, EXR and INFL denote banking sector development, gross domestic savings, public sector management and institutions, exchange rate and inflation. This study therefore transforms Equation (12) into its panel estimable form as specified in Equation (13) as follows;

$$lnY_{it} = \gamma_{0i} + \beta_{1}lnEG_{it} + \beta_{2}lnBSD_{it} + \beta_{3}lnGDS_{it} + +\beta_{4}lnPSMI_{it} + ln\beta_{5}EXR_{it} + ln\beta_{6}INFL_{it} + \varepsilon_{it}$$
(13)

It must be emphasized that all the variables in Equation (13) are already explained. $\beta_1, \beta_2, \beta_3, ..., \beta_6$ are the unknown parameters to be estimated, and ε is the stochastic error term assume to be normally distributed with zero mean and constant variance $\left[\varepsilon_{it}\tilde{N}(0, 1)\right]$. Also, γ_0 , ln, t and i indicate the unobserved country- specific heterogeneity, natural logarithm, time trend and the number of countries respectively. It must be noted that the choice of the sample variables in this study were influenced by the past studies (Aluko & Kolapo, 2020; Emudainohwo, 2020; Yartey, 2008).

3.2. Estimation strategy

This study adopts static panel estimation techniques to investigate the impact of public sector management and institutions on stock market development in SSA for the period 2005–2018. The empirical model stated in Equation (13) is static in nature therefore the appropriate estimation technique required is conversional static panel estimation techniques like pooled ordinary least squares (OLS), fixed effects and generalized least squares (GLS) estimators.

However, heterogeneity problem is the main issue we mostly encounter in utilizing panel data. As such, ignoring this individual effect may render inconsistent or meaningless estimates (Robertson & Symons, 2000). Following this assertion, Pooled Ordinary Least Squares (OLS) estimator is only appropriate and can produce consistent and efficient results if there is no individual heterogeneity among the countries (cross-section units). If this heterogeneity issue among the cross- sectional units is present in the data, then OLS will produce bias and inconsistent estimates. With this, the appropriate estimators required for this study are fixed effect and random effect models. Fixed effects estimator controls for this individual heterogeneity issue by differencing the data to wipe out any time-invariant characteristics so as to ascertain a consistent and efficient estimates. Random effects model on the hand assumes that, all individual differences are captured by the intercept parameter and thus, it treats the individual differences as random rather than fixed. Given this, the aforementioned estimators are appropriate and would fit this study well. In addition, the time dimension is also greater than cross-section units (T > N), which makes these estimators more reliable to be applied in this study.

It must be emphasized that Equation (13) is estimated ten (10) times; and this study names them model (1, 2, 3 and 4) in Table 5 and Models 1, 2 and 3 in Table 6 and Table 7, respectively. In Model (1–4) of Table 5, this study proxied stock market development with stock market capitalization which measures the size of the country's stock market (El Wassal, 2013). Therefore, adopting this measure over the alternative measures in model (1)–(4) is justified.

In an attempt to explore the impact of PSMI on stock market development in SSA, this study first assessed the overall index of PSMI (by assuming that PSMI is homogeneous across SSA countries) on stock market development. In Model 2, this study accounted for how quality of PSMI (heterogeneous) impacted on SSA stock markets. With this, countries that have PSMI score equal or above the threshold value of 3.5 are given 1 and 0 otherwise, where 1 and 0 signifies quality and poor PSMI in SSA, respectively. Scrutinizing PSMI cluster in this way is vital as it would assist this study to provide better policymaking path so as to maintain effective PSMI in SSA. Furthermore, the study also disaggregated the impact of PSMI into two categories (West Africa and East Africa) in Model 3 and 4, to find out whether the source of PSMI in Model 1 predominantly emanates from West Africa or East Africa countries. With this, countries that are not found within the category (West Africa or East Africa) would have zero PSMI score.

In Model (1)–(3) of Table 6, this study adopted three indicators⁴ of stock market development as a dependent variable to test the effect of PSMI on stock market development in SSA. This was done to check whether the choice of the measure of stock market development really matter in SSA. With this, the study used stock market capitalization as a dependent variable in Model 1, Turnover ratio as a percentage of GDP in local currency in Model 2 and the number of listed companies on the domestic stock exchange in Model 3. Last, in Model (1)–(3) of Table 7, we assessed the effect of individual components of PSMI⁵ on stock market development. Here, the focus is to check whether

targeting the individual components of PSMI would be relevant for policy purposes. As a result, we analyzed the effect of each component of PSMI on stock market capitalization, Turnover ratio and number of listed companies in SSA.

To choose between random and fixed effect, the study applied Hausman (1978) test to tests the hypothesis that the intercept term is not correlated with the explanatory variables. The Hausman-Wu test revealed that the null hypothesis of both models (random and fixed) are consistent and that the two estimates should not differ systematically. However, Hausman (1978) considers that fixed effect model is consistent, but random effect is not under the alternative hypothesis. In this case, if the study fails to reject the null hypothesis, then this study may use random effect in this analysis, on the grounds that random effect is efficient.

Hoyos & Sarafidis (2006) also revealed that panel data models are more likely to exhibit crosssectional dependence, due to the presence of the unobserved components that often becomes part of the error term. Therefore, this study adopts Lagrange multiplier (LM) test proposed by Breusch & Pagan (1980) to check for the presence (absence) of cross- country correlation. The null hypothesis of this test states that, the error term is assumed to be independent and identically distributed among the cross-sectional unit. The LM test statistic is computed as follows;

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}^{2}$$
(14)

with $\frac{N(N-1)}{2}$ degrees of freedom. Where $\hat{\rho}_{ij}$ denotes the sample estimate of the pairwise correlation of the residuals.

From Equation (14), the study expresses the null and alternative hypothesis of this test as:

$$\begin{split} H_0 : \hat{\rho}_{ij} &= \hat{\rho}_{ij} = \text{cor}\big(\varepsilon_{it}, \varepsilon_{jt}\big) = 0 \qquad \text{for} \quad i \neq j \\ H_1 : \hat{\rho}_{ij} &\neq \hat{\rho}_{ij} \neq \text{cor}\big(\varepsilon_{it}, \varepsilon_{jt}\big) \neq 0 \qquad \text{for} \quad i \neq j \end{split}$$

However, non-rejection of the null hypothesis indicates the absence of the aforementioned econometric problem. The Breusch and Pagan (LM) cross sectional dependence test is suitable for this study than other cross sectional dependence test like Pesaran's (2004) (CD) test, Friedman's (1937) and the test statistic proposed by Frees (1995), since it assumes small N and large T, of which (N = 6) and (T = 14) in this study.

3.3. Data description

This study has used secondary source of balanced panel data for six (6) selected SSA countries⁶ spanning from 2005 to 2018. The choice of this sample frame for the study is based on consistency and easily accessibility of data on the main variables.⁷ More specifically, the public sector management and institutions cluster is an index launched by World Bank in 2005, and available data for stock market development indicators likewise ends in 2018, hence the choice of this sample period for the study. The data for this study was extracted from four sources.⁸ Data on public sector management and institutions were sourced from World Bank's Development indicators (World Bank, 2020), Worldwide Governance Indicators and Environment Social and Governance Database. Stock market development data is also gleaned from Global Financial Development Dataset. Moreover, data on the rest of the sample variables were extracted from the World Bank's Development indicators (World Bank, 2020). We report the description of the variables used for this analysis in Table A1 (see the Appendix).

3.4. Panel unit root

This study applies Im et al., 2003) and Fisher-type panel stationarity tests to all the sample variables. The adoption of these two heterogeneous panel stationarity tests is to determine the

order of integration of the variables and to avoid any biasness that arise from non-stationarity of the variables used in this study. The use of stationary series prevents this study from reporting spurious results (Woodridge, 2015). The general unit root specification from Stock & Watson (2007) is given as;

$$Y_{it} = \delta Y_{t-i} + \theta X_{it} + U_{it}$$
(15)

Given the above equation, the variable Y_{it} has a unit roots if $|\delta| = 1$. The variable is weakly stationary if $|\delta| < 1$. Taking Y_{t-i} from each side of Equation (15) gives:

$$\Delta Y_{it} = (\delta - 1)Y_{t-i} + \theta X_{it} + U_{it}$$
(16)

Let $\delta - 1 = \vartheta$ so that the ADF- type specification now becomes:

$$\Delta \mathbf{Y}_{it} = \vartheta \mathbf{Y}_{t-i} + \theta \mathbf{X}_{it} + \sum_{j=1}^{\lambda} \gamma_{ij} \Delta \mathbf{Y}_{it-1} + \mathbf{U}_{it}$$
(17)

Where Y_{it} represents each variable used in this study, X_{it} stands for panel specific fixed effect, λ indicates the lag length. θ , t and i represent vector coefficient, time and cross-sectional units respectively.

The unit root test involves the following null and alternative hypothesis:

 $H_0: \vartheta = 0$ (The series is not stationary)

 $H_1: \vartheta < 0$ (The series is stationary)

If the null hypothesis is rejected, then the variable under consideration is stationary.

4. Analysis and discussion of empirical results

This section of the study presents the analyses and discussions of the results obtained from the data. Section one, two and three of this study contains the results of descriptive statistics, the correlation matrix of the variables and the unit root tests. Section four of this study displays the cross- sectional dependence results whereas the rest of the sections (five, six and seven) delve into the estimated panel regression results.

4.1. Descriptive statistics

This sub-section of the study presents the summary of descriptive statistics among the variables from 2005 to 2018. The results are reported in Table 1.

In Table 1, we observed that stock market capitalization as a percent of GDP is averaged 30% with minimum, maximum and standard deviation of -10%, 100% and 21%, respectively. Also, turnover ratio measured in this study as the value of shares traded on the domestic stock exchange relative to stock market capitalization is reported to have an average value of 0.11%. The minimum, maximum and standard deviation of this variable is shown to be -2.25%, 0.61% and 0.53% for the period 2005–2018. The mean values of stock market capitalization and turnover ratio reported in Table 1 shows that, SSA countries have small and illiquid stock markets. This finding support the assertion by Adelegan (2008) and Ngotho (2015), who demonstrates that SSA countries have small size and less liquid stock market due to the emergence of continuous collapse of banks and poor firm's outlook. In addition, it is evident that the number of listed companies relative to GDP is averaged 2.3% with minimum, maximum and standard deviation of 0.00%, 4.11% and 1.58% accordingly.

Table 1. Summary ofDescriptive statistics				
Variable	Mean	Standard deviation	Minimum	Maximum
MCAP	29.97	20.98	-10	100
TOR	0.1058	0.525	-2.25	0.61
NLC	2.347	1.5805	0.00	4.1109
PSMI	3.194	0.3503	2.4	3.90
EG	2.7026	2.7816	-6.6411	11.3155
EXR	608.5714	932.2745	0.9052	3727.06
BSD	16.6061	7.4563	4.0427	40.2041
INFL	127.6213	62.4339	52.9281	382.500
GDS	13.6004	9.2734	-4.1109	44.3313

Source: Author's construction using Stata 15.1. It must be noted that MCAP, TOR, NLC, PSMI, EG, EXR, BSD, INFL and GDS denote market capitalization, turnover ratio, number of listed companies, public sector management and institutions, economic growth, exchange rate, banking sector development, inflation and gross domestic saving.

It is interesting to note that the discrepancies between the minimum and maximum values of these three stock market development indicators reveal the magnitude of gap existed among the SSA countries employed in this study.

It is also revealed that, the mean score of PSMI is 3.19, with a minimum, maximum and standard deviation of 2.4, 3.90 and 0.35 score, respectively. According to the CPIA classifications of the World Bank (2013), SSA countries have a strong PSMI on average. However, the disparities between the minimum and maximum PSMI scores show that the majority of the SSA countries considered in this study fall below the 3.5 score criterion. Furthermore, the mean value of economic growth, proxy in this study by annual percentage growth of GNP per capita is recorded to be 2.70%, with a minimum and maximum values of -6.64% and 11.3%. It is also revealed that, economic growth does not deviate (2.78%) very much from its mean. Exchange rate on the other hand is displayed in Table 1 to have a high mean and maximum values of 608.57 and 3727.06, respectively. It is further indicated that, exchange rate has a higher dispersion (932.27) among the variables used in this study. The minimum value of exchange rate is 0.91.

With regard to the banking sector development, it is indicated that the mean, minimum, maximum and standard deviation of the aforementioned variable are 16.60%, 4.04%, 40.20% and 7.45%, respectively. Turning to inflation, it is shown that inflation has a mean value of 62.43% while the minimum, maximum and standard deviation are 52.93, 127.62%, 382.5 and 62.43%. Lastly, gross saving as a percentage of GDP is computed on average to be 13.60 percent, and the minimum, maximum and standard deviation of this indicator -4.11, 44.33, 9.27%, respectively. It is revealed from the summary statistics that exchange rate and inflation have a higher dispersion among the variables employed whereas public sector management and institutions has the lowest standard deviation.

4.2. Correlation matrix

In order to check whether the variables employed for this empirical analysis have no exact linear relationship among each other, this study adopted pairwise correlation test to examined the linear association among the variables and the results are reported in Table 2.

Table 2. Correlation matrix									
	MCAP	TOR	NCL	PSMI	EG	EXR	BSD	INFL	GDS
MCAP	1.000								
TOR	-0.1095	1.000							
NCL	-0.1648	0.5554***	1.0000						
PSMI	0.1929*	-0.2010*	-0.2032*	1.0000					
EG	-0.0981	0.0967	0.0871	0.4020***	1.0000				
EXR	0.3400**	-0.0783	-0.4978***	-0.1826*	-0.0899	1.0000			
BSD	-0.1519	0.2635**	0.2789**	0.1314	0.0310	-0.2137*	1.0000		
INFL	-0.0334	-0.6196***	-0.5709***	-0.0232	-0.2880*	0.0796	0.0422	1.0000	
GDS	-0.0145	-0.0075	0.0807	-0.5832***	0.0123	0.1669	-0.1995*	-0.1236	1.00

***, ** and * indicate the rejection of H₀ at 1%, 5% and 10% level of significance, respectively. It must be noted that MCAP, TOR, NLC, PSMI, EG, EXR, BSD, INFL and GDS denote market capitalization, turnover ratio, number of listed companies, public sector management and institutions, economic growth, exchange rate, banking sector development, inflation and gross domestic saving.

Given the variables involved in this study, it is observed that PSMI and exchange rate are the only variables that have a significantly positive association with stock market capitalization at 10 and 5 percent significance level. It is further indicated in Table 2 that; the rest of the variables have weak negative correlation with stock market capitalization. Using turnover ratio and number of listed companies as different indicators for stock market development, it is detected that; there exist a significantly negative association between PSMI, inflation and turnover ratio. Also, significantly negative correlation was emerged between PSMI, Exchange rate, inflation and the number of listed companies for the same period considered in this study. In addition, the study further revealed that banking sector development has a positive significant correlation with turnover ratio and the number of listed companies in SSA. This finding is not surprising since an increase in domestic credit to the private sectors; have a greater tendency of boosting investor's confidence to invest in either real or financial asset, which, in turn, increases the availability of liquid asset (cash) in financial market.

Given these correlation coefficients, the study however concludes that, the variables employed in this study are less likely to exhibit exact relationship since the correlation coefficients of all the variables are less than 0.70 (Kennedy, 2008).

4.3. Stationarity test results

In order to generate efficient and robust estimates of the unknown parameters, this study adopted two heterogeneous stationarity tests to check for the order of integration of the variables; and the results are reported in Table 3.

Table 3. Panel unit root tests result				
	IPS (2	2003)	Fisher	- ADF
Variables	At level [I(0)]	At 1st difference [I(1)]	At level [I(0)]	At 1st difference [I(1)]
MCAP	0.0582	-13.0155***	3.3297***	33.6952***
TOR	1.5733	-4.8964***	0.7966	18.1051***
PSMI	1.2086	-2.8183**	-1.5557	4.5021***
EG	-1.3680*	-5.6383***	1.8652**	13.6351***
EXR	2.9077	-2.0793**	-2.1145	2.4750***
BSD	-3.2639***	-2.5780***	6.4869***	4.6685***
INFL	2.8841	-2.9287**	-1.3956	9.3852***
GDS	-0.4776	-4.0450***	0.4054	8.2254***

If H₀ is rejected then the series is stationary. Hence, ***, ** and * indicate the rejection of H₀ at 1%, 5% and 10% level of significance respectively. It must be noted that MCAP, TOR, NLC, PSMI, EG, EXR, BSD, INFL and GDS denote market capitalization, turnover ratio, number of listed companies, public sector management and institutions, economic growth, exchange rate, banking sector development, inflation and gross domestic saving.

Based on Im et al., 2003) test, the study reveals that, all the variables employed in this study are non-stationary in the levels except economic growth and banking sector development which are stationary at 10 and 5 percent significance level, respectively. It is shown in Table 3 that market capitalization, economic growth and banking sector development are stationary in the levels using Fisher-ADF test. It is further indicated in this study that, all the variables involved in this study are stationary in the first difference using both tests. It must be emphasized that, these tests did not include any trend both in levels and first difference. Given the stationarity of the variables used in the study, this study continued to test whether there is cross- sectional dependency among the countries.

4.4. Cross-sectional dependence test results

To ensure that there is no cross- country correlation among the countries, this study used Breusch and Pagan (1980) LM test and Pesaran (2004) CD test to identify the cross-sectional dependence among the countries. The null hypothesis of these tests states that, the error terms are independent among the cross-sectional unit and the alternative hypothesis states otherwise. Given this, the study fails to reject the null hypothesis if the probability values are greater than 5% significance level.

Models	CD test statistic	LM test statistic
	Table 5	
Model 1	0.576 (0.5649)	22.963 (0.0849)
Model 2	0.537 (0.5911)	25.910 (0.079)
Model 3	1.061 (0.2889)	6.951 (0.0735)
Model 4	-0.622 (0.534)	2.750 (0.4318)
	Table 6	
Model 1	0.576 (0.5649	22.963 (0.0849)
Model 2	0.802 (0.4228)	18.083 (0.2583)
Model 3	-0.387 (0.6986)	7.885 (0.9283)
	Table 7	
Model 1	0.509 (0.6104)	9.570 (0.8459)
Model 2	1.294 (0.1957)	25.624 (0.0522)
Model 3	0.006 (0.9952)	16.661 (0.3395)

Table 4. Cross-sectional dependence test results

In the parenthesis are the probability values. Source: Author's construction using Stata 15.1

It is observed from Table 4 that the underlying panel regression models passed the diagnostic tests. From Model (1)–(4) of Table 5 and (1)–(3) of Table 6 and 7, the LM test statistic and their respective probability values indicate the acceptance of null hypothesis of no serial correlation in the residuals. In addition, employing Pesaran (2004) CD test to check for the robustness of these results, the CD test results also affirmed that the estimated panel regression models do not suffer from any cross-country correlation. Validating the assumption that there is no cross-country

correlation, this study applied fixed and random estimations technique to estimate the unknown parameters.

4.5. Estimated panel regression results of PSMI on SMD

To ascertain the effect of public sector management and institutions on SSA stock market development, the study reports on three estimation results as shown in Table 5, 6 and 7. Table 5 reports on estimated panel regression results for scrutinizing PSMI on four different strands. In Model 1, this study assessed the overall index of public sector management and institutions on stock market development. In Model 2, the study accounted for how quality of public sector management and institutions impacted on SSA stock market development. In addition, this study reports the estimated results obtained for disaggregating PSMI into West Africa and East Africa in Model 3 and 4, respectively. Furthermore, Table 6 reports on the effect of PSMI on stock market development in SSA, where three indicators (stock market capitalization, turnover ratio and the number of listed companies) of stock market development for direct policy purposes, we assessed each component of PSMI⁹ affect stock market development in SSA. With this, we again adopted the three measures of stock market development (market capitalization, turnover ratio and number of listed firms) as a dependent variable and the results are reported in Table 7.

Using the overall index of PSMI (which is viewed as an average effect), it is observed in Model 1 of Table 5 that PSMI cluster, significantly improves stock market development in SSA at 5% significance level. The coefficient suggests that if PSMI is enhanced, stock markets in SSA will be developed on average by 0.27%. Undeniably, this positive impact of PSMI on SSA stock markets could be attributed to the adoption of new public sector management (NPM) reforms, which shifted the emphasis of most governments in SSA from the traditional public administration to public management. Ayee (2005) asserted that NPM in SSA was associated with positive and action-oriented phase which promulgated reinventing in governance, organizational

Table 5. Estimated panel regression of PSMI on SMD					
Variables	Model 1	Model 2	Model 3	Model 4	
PSMI	0.2724** (0.1014)				
PSMI_Q		0.1643** (0.0655)			
PSMI_WA PSMI_EA			0.2460*** (0.0573)	0.2212 (0.2278)	
EG	-0.0123*	-0.0062**	-0.0073	-0.0230**	
	(0.0062)	(0.0057)	(0.0053)	(0.0099)	
EXR	0.0005***	0.0006***	0.0003*	0.0005	
	(0.00005)	(0.00006)	(0.0001)	(0.00006)	
BSD	-0.0130***	-0.0107**	0.0085	-0.0116**	
	(0.0046)	(0.0045)	(0.0061)	(0.0049)	
INFL	-0.0006*	-0.0005	-0.0009**	-0.0022***	
	(0.0003)	(0.0003)	(0.0003)	(0.0005)	
GDS	0.0026	-0.0029	-0.0062***	0.0038	
	(0.0025)	(0.0025)	(0.0020)	(0.0046)	
Constant	-0.5067	0.1763	-0.6039***	-0.4760	
	(0.3277)	0.1073)	(0.2051)	(0.7652)	
Hausman statistic	73.77	88.29	4.60	121.70	
Prob. Value	0.0000	0.0000	0.5966	0.0000	

In the parenthesis are the standard errors. Hence *******, ****** and ***** indicate the rejection of H₀ at 1%, 5% and 10% level of significance respectively. The dependent variable for model 1–4 is stock market capitalization. The variables PSMI_Q, PSMI_WA and PSMI_EA represent quality of PSMI, and PSMI for countries in the West and East of SSA, respectively. The rest of the variables are defined in chapter 3.

transformation, quality management and paradigm shift in the SSA public sector. This positive signal emanated from effective management of the public sector; boosted the confidence level of investors towards holding long term financial assets. This finding supports the earlier study by Emudainohwo (2020) but failed to agree with the studies by Afful & Aseidu (2014).

Again, it is detected in Model 2 of Table 5 that, countries with quality PSMI tend to improve their stock market at 5% significance level compared to their counterparts. There is no doubt in this finding that, an economy with strong PSMI (well laid property rights, good governance, quality financial and budgetary management, effective revenue mobilization and avoidance of corruption) tend to restore the credibility of financial markets (including the stock market). Hence, this enhances the confidence level of both domestic and foreign investors to lend money to firms. This empirical finding is consistent with the previous studies by Manasseh et al. (2017), Winful etal. (2016), Yartey (2010), Hooper et al. (2009) and Gazdar & Cherif (2014), who viewed that stock markets in a well governed country have high return and lower risk than countries without good governance.

Also, in disaggregating the impact of PSMI cluster into West and East Africa to find out the source of this positive effect of PSMI in Model 1, the study revealed in Model 3 and 4 of Table 6 that, PSMI cluster improves stock market development in each bloc (West or East) of SSA countries. We found that if PSMI improves in SSA by one percentage point, stock markets development in SSA will increase on average by about 0.25% and 0.22%, respectively. Even though the results show that the effect of PSMI is insignificant in East African communities. This insignificant effect of PSMI cluster in the East African countries could be attributed to the fact that policies and regulations of governments in East Africa communities (EAC) are not focus on stock market development. Hence, the activities of the PSMI do not trickle down to impact on stock market development in East Africa communities. As highlighted by Ayee (2005), the public sector was regarded as a pivot for socio economic development in Africa after independence, but the role played by the public sector to enhance major sectors of the economy to achieve the targeted developmental goal was not realized due to excessive accumulation of power and strict bureaucratic nature in Africa.

Contrary to theory, it is observed in Model 1, 2 and 4 that economic growth has a negatively significant effect on stock market development in SSA. Specifically, the coefficients of -0.012, -0.006 and -0.023 indicate that, if economic growth increases by one percentage point, stock market development in SSA would be deteriorated by approximately 0.012, 0.006 and 0.023 percent, respectively, holding all other covariates constant. Similarly, splitting the impact of PSMI into West and East Africa, it is reported in Model 3 and 4 of Table 6 that, economic growth has a negative but insignificant effect on stock market development in SSA countries located at West but the effect is significant in the countries located at East. Based on the portfolio choice theory, an increase in income increases the demand for money including all financial assets. However, this negative relationship could possibly be attributed to the fact that, an increase in income or output in SSA makes individuals and other investors to hold more of debt instrument relative to the long-term financial assets due to the inefficiency of SSA stock markets. This result refutes the studies a prior expectation even though, it confirms the studies by Ming et al. (2018) and Nkechukwu et al. (2013).

In addition, this study revealed a positive significant impact of exchange rate on stock market development across the Model 1–3. The coefficients of exchange rate connote that, if exchange rate increases by one percentage point, stock market development would be enhanced by approximately 0.0005%, 0.0006% and 0.0003%, respectively. This finding is not actually surprising since an increase in exchange rate implies depreciation of the domestic currency. From the flow oriented model, however, a depreciation of the domestic currency enhances firm's export, which in turn, improves the market value of firms. With this, investors are more optimistic about the firm's future profit and hence, are more inclined to hold any asset of the firm. This therefore encourages investors to actively participate in the secondary market of the stock market.

Banking sector development also has a negative and significant effect on stock market development in Model 1, 2 and 4. As Table 5 is concerned, it is observed in Model 1 that, one percentage point increase in banking sector development would worsen stock market development in SSA by approximately 0.01 percentage point. This result reflects the view that, if banking sector in SSA countries becomes stable, and are able to eradicate unnecessary liquidity constraints, investor's and other concern individuals would prefer banking sector products like fixed deposit, demand deposit and corporate bonds rather than long term financial assets. This result supports the studies by Yartey (2008) and Garcia and Liu (1999), who asserted that banking sector development impacts negatively on stock market growth because banks and stock markets tend to substitute each other as a financing platform.

Consistent with the study's a priori expectation, inflation is detected to have a significantly negative impact on stock market development in SSA. As revealed in Model 1, 3 and 4 of Table 6, one percentage point increase in inflation decreases stock market development by about 0.0006, 0.0009 and 0.0022 percentage point, respectively. This outcome can be viewed from the point that, higher inflation increases firm's cost of production, which, in turn, reduces firm's profit and dividends. Following this, investors tend to diversify their portfolio holdings and prefer more of debt market instruments rather than shares or equities. This is because, higher inflation erodes some proportion of firm's profit margin and reduces dividends paid to shareholders. This result falls in line with the studies by Mujataba & Arshad (2020), Andrianaivo and Yartey (2010) Yartey & Adjasi(2007) and Ho and Iyke (2017).

Gross domestic saving as a percentage of GDP is found to contribute negatively to stock market development in SSA. However, the effect turned out to be significant in model 3. The coefficient (-0.0062) of gross domestic saving implies that, one percentage point increase in gross saving decreases stock market development by approximately 0.006 percentage point holding all other covariates unchanged. This finding points to the fact that economic agents (Households, firms and governments) in SSA economies prefer saving with the banks and other financial institutions rather than holding stock market instruments. It can be interpreted from this result that investors in SSA prefers short-term investment compared with long term as suggested by Adam and Tweneboah (2008).

It must be emphasized that, based on the Hausman test conducted, we interpreted the fixed effect regression results in Model 1, 2 and 4, whereas random effect regression is presented in Model 3.

In conclusion, we identified that PSMI improves stock market development in SSA but just that its effect on stock market development in East Africa communities turned to be insignificant.

4.6. Estimated panel regressions of PSMI on each measure of SMD

In Table 6, we report on the effects of PSMI on each indices of stock market development¹⁰ in SSA.

With this, we observed in Model 1 and 2 of Table 6 that PSMI has a positive and significant effect on stock market capitalization and turnover ratio in SSA at 1% and 5% significance level, respectively. These positive coefficients imply that if PSMI improves in SSA, stock market capitalization and turnover ratio will be enhanced by approximately 0.27% and 4.76%, respectively. The findings suggest that if all the indicators of PSMI are well curtailed in SSA, both domestic and foreign investors will be more inclined to hold long-term financial assets which in turn would enhance stock market development in SSA. However, the effect of PSMI on number of listed companies was found to be negative and significant as shown in Model 3. This outcome connotes that improvement in PSMI will worsen the number of listed companies in SSA by about 1.69%.

It can be construed from these results that if governments strengthen their scrutiny procedures through Security Exchange Commissions to ensure that firms listed on domestic exchanges meet the requirements in SSA, the number of listed firms will plummet. of companies in SSA are listed on the domestic stock exchange through connections or unlawful ways. As the control variables are concern,

Table 6. Estimated panel regressions of PSMI on SMD					
	Model 1	Model 2	Model 3		
Variables	МСАР	TOR	NLC		
PSMI	0.2724***	4.7620**	-1.6908***		
	(0.1014)	(2.0506)	(0.4120)		
EG	-0.0123*	0.0497	0.0191		
	(0.0062)	(0.1261)	(0.0427)		
EXR	0.0005***	0.0035***	-0.0008***		
	(0.00005)	(0.0011)	(0.0001)		
BSD	-0.0130***	0.1332	0.0513***		
	(0.0046)	(0.0924)	(0.0143)		
INFL	-0.0006*	-0.0549***	-0.0171***		
	(0.0003)	(0.0068)	(0.0023)		
GDS	-0.0026	-0.3420***	-0.0117		
	(0.0025)	(0.0504)	(0.0145)		
Constant	-0.5067	-6.9231	9.6266***		
	(0.3277)	(6.6268)	(1.4516)		
Hausman statistic	73.77	77.61	11.13		
Prob. value	0.0000	0.0000	0.0845		

In the parenthesis are the standard errors. Hence *******, ****** and ***** indicate the rejection of H_0 at 1%, 5% and 10% level of significance, respectively. The dependent variables MCAP, TOR and NLC denote stock market capitalization, turnover ratio and number of companies listed, respectively.

we observed in Models (1)–(3) of Table 6 that with the exception of economic growth and exchange rate, the rest of the variables (banking sector development, inflation and gross domestic saving) has negative effect on stock market development. In addition, it must be noted that the results obtained from Table 6 were not substantially different from the one we had already interpreted in Table 5.

4.7. Estimated panel regressions of each components of PSMI on SMD

Turning to Table 7, where we investigated the individual effect of PSMI on stock market development in SSA, this study revealed that efficient revenue mobilization by government exerts a significantly positive impact on turnover ratio and number of listed companies in SSA as shown in Model (2) and (3), respectively, but insignificant effect was detected when stock on stock market capitalization was proxied for stock market development. The coefficients (8.11 and 0.60) indicate that if governments in SSA reduce corporate taxes by one percentage point, turnover ratio and the number of listed companies in SSA will be enhanced by about 8.11 and 0.60 percentage point, respectively. These findings point to the view that, the extent to which governments mobilize funds in the form of tax is particularly crucial in SSA. According to Modigliani & Miller (1958 and 1963) propositions, higher corporate taxes dampen the willingness of investors to hold long-term financial assets. With this, efficient revenue mobilization by governments in the form of optimal tax is desirable to improve stock market development in SSA. This outcome supports Demirgüç-Kunt & Maksimovic (1996), who asserts that potential investors acquire stocks of firms that are traded on well business friendly environment.

In Models (1)–(3) of Table 7, the study found that property rights and rule-based governance have a negative effect on all the measures of stock market development in SSA. However, we observed that the effect of property rights and rule-based governance is only significant in Model 3, where the number of listed companies were used as a measure of stock market development. The coefficient of 1.65 indicate that if property rights and rule-based governance is improved in SSA, the number of listed companies on domestic exchange will decline by 1.65%. This finding suggests that if strict contract rights (indenture) are respected and enforced in stock market as it is usually done in debt market, the number of listed companies in SSA will decrease. This is because firms

have the view that equity holders are paid last and for that matter they take the greatest risk. Hence, majority of companies in SSA enroll on domestic stock exchanges with the intention of securing safe and stable long-term funds. With this, he government's rigorous regulations (contract rights) would prevent most companies from being listed on a domestic exchange.

Quality of budgetary and financial management is shown in Model 1 of Table 7 to have significantly negative impact on stock market capitalization in SSA. However, insignificant relationships were emerged when the number of listed companies and turnover ratio were used as proxies for stock market development. These results suggest that if budgetary and financial management enhance in SSA, stock market capitalization will be distorted by about 0.62 percentage. This negative effect could be attributed to the fact that stock market development is not part of government's policy focus in SSA. As result, how stock market will develop in SSA are not seriously prioritize in government's budget in SSA.

Table 7. Estimated panel regressions of each components of PSMI on SMD					
	Model 1	Model 2	Model 3		
Variables	МСАР	TOR	NLC		
ERB	0.5364	8.1109***	0.6002**		
	(0.5209)	(2.0354)	(0.2786)		
PRG	-0.2559	-3.2466	-1.6495***		
	(0.5335)	(2.0725)	(0.4297)		
QBFM	-0.6195*	0.2697	-0.2638		
	(0.3412)	(1.3462)	(0.3473)		
PADMI	0.5548	-0.9916	0.1870		
	(0.5020)	(1.9768)	(0.4032)		
СС	0.3554	6.0035	-0.0325		
	(1.2099)	(4.4677)	(0.6569)		
VA	1.3427	6.8558*	0.2010		
	(0.9902)	(3.5184)	(0.7169)		
EG	-0.7556**	0.0759	0.0715*		
	(0.0371)	(0.1465)	(0.0424)		
EXR	0.0014***	0.0011	-0.0004**		
	(0.0004)	(0.0014)	(0.0002		
INFL	-0.0031	-0.0483	-0.0104***		
	(0.0027)	(0.0099)	(0.0029)		
Constant	2.6474	-4.6615	6.9172***		
	(3.5293)	(13.8425)	(2.3370)		
Hausman statistic	18.67	124.35	14.25		
Prob. value	0.0282	0.0000	0.1138		

In the parenthesis are the standard errors. Hence *******, ****** and ***** indicate the rejection of H_0 at 1%, 5% and 10% level of significance, respectively. The dependent variables MCAP, TOR and NLC denote stock market capitalization, turnover ratio and number of companies listed, respectively

Again, the result revealed that public administration corruption control does not play any significant role in SSA stock markets. This finding connotes that; how central government staffs in SSA countries are structured to design and implement government policy does not influence stock market development in SSA.

As shown in Model 2 of Table 7, voice and accountability has a significantly positive effect on turnover ratio in SSA. It is further indicated that, voice and accountability do not have any significant effect on stock market capitalization and number of listed companies. It is worth noting from the results that, if voice and accountability improves in SSA, turnover ratio as a percentage of GDP in SSA will be enhanced by about 6.86 percentage point. This finding

posits that if citizens are exclusively get involved in selection of governments in SSA, their confidence level and trust will be enhanced and for that matter they will be more enthusiastic to lend money to firms in the economy.

In conclusion, we identified that PSMI is vital in SSA though its effect on East Africa communities were found to be insignificant. SSA.

5. Summary and concluding remarks

The association between stock market development and public sector management and institutions has not been extensively discussed among scholars. The primary focus in literature has been based on the role that institutions play in influencing stock market growth in sub Saharan Africa. With this, the precise link between stock market development and public sector management and institution needs to be investigated empirically in SSA. This study therefore uses balanced panel data on six (6) selected SSA countries to explore the impact of public sector management and institutions on stock market development in SSA for the period 2005–2018. Applying fixed and random effect models as estimation techniques, we observed that countries that have quality public sector management and institutions have improved their stock market development compared to countries without quality of public sector management and institutions. Again, in testing for the individual components of PSMI on stock market development, this study further revealed that, with regardless of the choice of the measure of stock market development, efficient revenue mobilization has significantly positive effect on SSA stock markets. However, property right and rule based governance, budgetary and financial management, voice and accountability were also detected in this study to impact negatively on SSA stock markets. Public administration and corruption control on the hand were revealed to have insignificant effect on stock market development.

Based on these results, this study concludes that public sector management and institutions are vital determinant of stock market development in SSA. Again, it must be noted that, the choice of the measure of stock market development is also important in SSA. The study therefore suggests that, governments in SSA should put in place stringent measures that seek to enhance public sector management and institutions in SSA. This can be achieved if governments institute or contract private agency to monitor day to day activities of government institutions (Security Exchange Commission) to make sure that, they are not been entangled with corruption and are able to give proper accounts to its citizens. This will ensure that companies that do not meet the minimum requirement of \$146,600 in the case of Ghana are not listed on the domestic stock exchange. This will ensure a credible financial system including stock market and hence, firm's access to funds in SSA would be enhanced.

This study also recommends that policy makers in East Africa communities should inculcate stock market development as part of their policy priorities given the benefits of stock market development in SSA. This can be ascertained if solid education on the benefits and modalities of investing in equities are provided by governments through contracting financial journalists to organize workshop or telecast information on stock market activities to the general public on daily or weekly basis. This will help local investors to understand and appreciate investment in stocks. This will also boost the interest of the local investors in investing in shares relative to debt market instruments or other fixed income securities with banks.

Funding

The authors received no direct funding for this research.

Author details

Gideon Mensah¹ E-mail: mensahgideon102@gmail.com ORCID ID: http://orcid.org/0000-0002-5710-7277 Anthony Kofi Osei-Fosu¹ E-mail: akosei-fosu.cass@knust.edu.gh Grace Nkansah Asante¹ E-mail: graceoforiabebrese@knust.edu.gh

¹ Department of Economics, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Citation information

Cite this article as: The Effects of Public Sector Management and Institutions on Stock Market Development in Sub- Saharan Africa, Gideon Mensah, Anthony Kofi Osei-Fosu & Grace Nkansah Asante, *Cogent Economics & Finance* (2022), 10: 2109278.

Notes

- 1. Stock market capitalization.
- 2. Budgetary and financial management, revenue mobilization and public administration.
- 3. Property rights and rule-based governance, voice and accountability, corruption control, and transparency in the public sector.
- 4. Stock market capitalization, turnover ratio and number of listed companies.
- 5. Budgetary and financial management, revenue mobilization, public administration,

property rights and rule-based governance, voice and accountability, corruption control, and transparency in the public sector.

- 6. Cote d'Ivoire, Ghana, Kenya, Malawi, Nigeria and Uganda.
- 7. Public sector management and institutions and stock market development.
- World Bank's Development indicators, Worldwide Governance Indicators, Environment Social and Governance Database and Global Financial Development Dataset.
- Efficient revenue mobilization, property right and rule- based governance, budgetary and financial management, public administration, control of corruption and voice and accountability.
- 10. Stock market capitalization, turnover ratio and the number of listed companies.

References

- Adam, A. M., & Tweneboah, G. (2008). Do macroeconomic variables play any role in the stock market movement in Ghana? SSRN Electronic Journal. Available at SSRN 1152970. MPRA Paper No. 14079, posted 15 Mar 2009 03:10 UTC. https://doi.org/10.2139/ssrn. 1152970
- Adelegan, O. J. (2008). Can regional cross-listings accelerate stock market development? Empirical evidence from sub-Saharan Africa. International Monetary Fund.
- Aduda, J., Masila, J. M., & Onsongo, E. N. (2012). The determinants of stock market development: The case for the Nairobi Stock Exchange. *International Journal* of Humanities and Social Science, 2(9), 214–230.
- Afful, K. B., & Asiedu, K. F. (2014). Stock markets development in Sub-Saharan Africa: Business regulations, governance and fiscal Policy. International Journal of Economics and Finance, 6(1), 15–31.
- Aluko, O. A., & Kolapo, F. T. (2020). Macroeconomic factors and stock market development in sub-Saharan Africa: Does the measure of stock market development matter? *Transnational Corporations Review*, 12 (1), 53–62. https://doi.org/10.1080/19186444.2019. 1683433
- Asongu, S. A. (2012). Government quality determinants of stock market performance in African countries. *Journal of African Business*, 13(3), 183–199. https:// doi.org/10.1080/15228916.2012.727744
- Ayee, J. R. (2005). Public sector management in Africa. Economic Research Working Paper Series, 82.
- Bekaert, G., Harvey, C. R., & Lundblad, C. (2005). Does financial liberalization spur growth? *Journal of Financial Economics*, 77(1), 3–55. https://doi.org/10. 1016/j.jfineco.2004.05.007
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification

in econometrics. The Review of Economic Studies, 47 (1), 239–253. https://doi.org/10.2307/2297111

- Calderon-Rossell, R. J., 1991, June. The determinants of stock market growth. In Pacific Basin Capital Markets Research Proceeding of the Second Annual Pacific Basin Finance Conference (Vol. 2, pp. 4–6).
- Canh, N. P., Thai, N. V. H., & Schinckus, C. (2018). Stockreturn co-movements and institutional quality: An empirical investigation of the European emerging markets. *Theoretical Economics Letters*, 8(5), 820–843. https://doi.org/10.4236/tel.2018.85058
- Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, 81 (1), 163–192. https://doi.org/10.1016/j.jdeveco.2005. 05.010
- De Hoyos, R. E., & Sarafidis, V. (2006). Testing for crosssectional dependence in panel-data models. *The Stata Journal*, 6(4), 482–496.
- Demirgüç-Kunt, A., & Maksimovic, V. (1996). Stock market development and financing choices of firms. The World Bank Economic Review, 10(2), 341–369.
- El Ouadghiri, I., Guesmi, K., Peillex, J., & Ziegler, A., 2021. Public attention to environmental issues and stock market returns (No. 22-2019). Ecological economics, 180, 106836.
- El Wassal, K. A. (2013). The development of stock markets: In search of a theory. *International Journal of Economics and Financial Issues*, 3(3), 606–624.
- Eldomiaty, T. I., Al Qassemi, T. B. F., Mabrouk, A. F., & Abdelghany, L. S. (2016). Institutional quality, economic freedom and stock market volatility in the MENA region. Macroeconomics and Finance in Emerging Market Economies, 9(3), 262–283. https:// doi.org/10.1080/17520843.2015.1093011
- Emudainohwo, O. B. (2020). IFRS and stock exchange development in sub-Saharan Africa: A logistic model. *Innovations*, 17(3), 397–407. http://doi.org/10.21511/ imfi.17(3).2020.30
- Farid, S. (2013, October). Financial integration in African emerging markets. In African Economic Conference (Vol. 10, No. 3, pp. 1–18).
- Frees, E. W. (1995). Assessing cross-sectional correlation in panel data. *Journal of Econometrics*, 69(2), 393–414. https://doi.org/10.1016/0304-4076(94) 01658-M
- Friedman, M. (1937). The use of ranks to avoid the assumption of normality implicit in the analysis of variance. Journal of the American Statistical Association, 32(200), 675–701. https://doi.org/10. 1080/01621459.1937.10503522
- Garcia, V. F., & Liu, L. (1999). Macroeconomic determinants of stock market development. *Journal of Applied Economics*, 2(1), 29–59.
- Gazdar, K., & Cherif, M. (2014). The quality of institutions and financial development in mena countries: An empirical investigation. *Risk governance & control: Financial markets & institutions*. 4(4–1), 65–80. https://doi.org/10.22495/rgcv4i4c1art1
- GFDB. (2020). World Bank's Global Financial Database. Washingtin DC.
- Guzmán, A., Mehrotra, V., Morck, R., & Trujillo, M. A. (2020). How institutional development news moves an emerging market. *Journal of Business Research*, 112, 300–319.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 46 (6), 1251–1271. https://doi. org/10.2307/1913827
- Henry, P. B. (2000). Do stock market liberalizations cause investment booms? Journal of Financial Economics,

58(1-2), 301-334. https://doi.org/10.1016/S0304-405X(00)00073-8

- Ho, S. Y., & Iyke, B. N. (2017). Determinants of stock market development: A review of the literature. Studies in Economics and Finance.
- Hooper, V. J., Ah Boon, S., & Asfandyar, U. (2009). Governance and stock market performance. *Economic Systems*, 33(2), 93–116. https://doi.org/10. 1016/j.ecosys.2009.03.001
- Humpe, A., & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. Applied Financial Economics, 19(2), 111–119. https://doi.org/ 10.1080/09603100701748956
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53–74.
- Imran, Z. A., Ejaz, A., Spulbar, C., Birau, R., & Nethravathi, P. S. R. (2020). Assessing the impact of governance quality on stock market performance in developed countries. *Economic Research-Ekonomska Istraživanja*, 33 (1), 3406–3426. https://doi.org/10. 1080/1331677X.2020.1774789
- Kennedy, P. (2008). A guide to econometrics. John Wiley & Sons. Available at http://masonlec.org/site/files/ 2012/05/Econometrics-Book-Intro-Ch-1-and-2.pdf
- Kenton, W. (2019). Stock Market Crash of 1987. Retrieved January, 29, 202.
- Liang, C., Li, Y., Ma, F., & Wei, Y. (2021). Global equity market volatilities forecasting: A comparison of leverage effects, jumps, and overnight information. International Review of Financial Analysis, 75, 101750. https://doi.org/10.1016/j.irfa. 2021.101750
- Low, S. W., Tee, L. T., & Kew, S. R. (2015). Does the quality of governance matter for equity market risk? Evidence from emerging and developed equity markets. Journal of Business Economics and Management, 16(3), 660–674.
- Manasseh, C. O., Mathew, T. E., & Ogbuabor, J. E. (2017). Investigating the nexus between institutional quality and stock market development in Nigeria: An Autoregressive Distributed Lag (ARDL) approach. *African Development Review*, 29(2), 272–292. https:// doi.org/10.1111/1467-8268.12256
- Ming, K. L. Y., Jais, M. B., Abd Rahim, R., & Che-Ahmad, A. (2018). Corruption and stock market development: Evidence from Asian countries. The Journal of Social Sciences Research, 357–362.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261–297. https://www.jstor.org/stable/1809766
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. The American Economic Review, 53(3), 433–443. https:// www.jstor.org/stable/1809167
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, 53(3), 433-443.
- Mujtaba, M. A. K. D. G., & Arshad, C. (2020). Corruption, Crime, Credit Rating. And Stock Market Development in Pakistan: An Analysis Through ARDL Bounds Testing.
- Ngare, E., Nyamongo, E. M., & Misati, R. N. (2014). Stock market development and economic growth in Africa. *Journal of Economics and Business*, 74, 24–39. https:// doi.org/10.1016/j.jeconbus.2014.03.002
- Ngotho, P. S. (2016). Stock Markets, Banks And Growth In Sub-Saharan Africa (Doctoral dissertation, University of Ghana).

- Nkechukwu, G., Onyeagba, J., & Okoh, J. (2013). Macroeconomic variables and stock market prices in Nigeria: A co-integration and vector error correction model tests. International Journal of Science and Research (IJSR), 4(6), 717–724.
- Ofori-Abebrese, G., Amporfu, E., & Sakyi, D. (2016). Do economic policy decisions affect stock market development in Ghana? *Botswana Journal of Economics*, 14(1), 33–51. https://www.ajol.info/index. php/boje/article/view/152562
- Otchere, I., Senbet, L., & Simbanegavi, W. (2017). Financial sector development in Africa-an overview. *Review of Development Finance*, 7(1), 1–5. https://doi. org/10.1016/j.rdf.2017.04.002
- Pesaran, H. M. (2004). General diagnostic tests for crosssectional dependence in panels. University of Cambridge, Cambridge Working Papers in Economics: 435. https://doi.org/10.1007/s00181-020-01875-7
- Robertson, D., & Symons, J. (2000). Factor residuals in SUR regressions: Estimating panels allowing for cross sectional correlation (No. 473). Centre for Economic Performance, London School of Economics and Political Science.
- Schmukler, S., & Levine, R. (2003). Migration, spillovers, and trade diversion: The impact of internationalization on stock market liquidity. The World Bank.
- Stock, J. H., & Watson, M. W. (2007). Why has US inflation become harder to forecast? Journal of Money, Credit, and Banking, 39, 3–33. https://doi.org/10.1111/j. 1538-4616.2007.00014.x
- Tachiwou, A. M. (2010). Stock market development and economic growth: The case of West African monetary union. International Journal of Economics and Finance, 2(3), 97–103. https://doi.org/10.5539/ijef. v2n3p97
- Tahari, A., Brenner, P. D., De Vrijer, E., Moretti, M., Solé, J. A., Senhadji, A., & Sensenbrenner, G. (2007). Financial sector reforms and prospects for financial integration in Maghreb countries. Journal of Money, Credit and banking.
- Twerefou, D. K., Abbey, E., Codjoe, E. A., & Ngotho, P. S. (2019). Impact of stock market development on economic growth: Evidence from selected sub-Saharan African countries. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 67(4), 1071–1083. https://doi.org/10.11118/ actaun201967041071
- WDI. (2020). World Bank's Development Indicators. Washington DC.
- WDI. (2021). World Bank's Development Indicators. Washington DC.
- Winful, E. C., Sarpong, D., & Agyei-Ntiamoah, J. (2016). Relationship between institutional quality and stock market performance: Evidence from emerging economies. African Journal of Business Management, 10 (19), 469–484. https://doi.org/10.5897/AJBM2016.8153
- Woodridge, J. (2015). Econometrics an Introductory. Boston, USA: Cengage.
- World Bank. (2013) . Africa development indicators 2012/ 2013.
- Yartey, C. A., 2008. The determinants of stock market development in emerging economies: Is South Africa different? IMF Working Papers, pp.1–31.
- Yartey, C. A. (2010). The institutional and macroeconomic determinants of stock market development in emerging economies. *Applied Financial Economics*, 20(21), 1615–1625. https://doi.org/10.1080/09603107.2010. 522519
- Yartey, C. A., & Adjasi, C. K. (2007). Stock market development in sub-Saharan Africa: Critical issues and challenges.

Appendix

Table A1. Summary of variable description					
Variables	Measurement/Proxy	Expected sign	Source		
Stock market development	Market capitalization, turnover ratio and number of listed companies		GFDDB (2019)		
PSMI	PSMI cluster average ranges from 1 (low) to 6 (high)	Positive	WDI (2020), WGI (2020) and ESGDB (2021)		
Economic growth	GDP per capita growth (annual %)	Positive	WDI (2021)		
Inflation	Consumer price index (2010 = 100)	Negative	WDI (2020)		
Banking sector development	Domestic credit to private sector by banks (% of GDP)	Uncertain	WDI (2020)		
Gross domestic saving	Gross savings (% of GDP)	Uncertain	WDI (2021)		
Exchange rate	Official exchange rate	Positive	WDI (2021)		

GFDDB, WDI, WGI and ESGDB denote Global Financial Development Indicators Database, World Bank's Development Indicators, Worldwide Governance Indicators and Environment Social and Governance Database



© 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Under the following terms: Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

Cogent Economics & Finance (ISSN: 2332-2039) is published by Cogent OA, part of Taylor & Francis Group. Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com