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The Dynamic Relationship Between Macroeconomic and Institutional Factors on Stock Market Capitalization: Evidence from Sub-Saharan African Capital Markets

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Abstract

The stock market as an important segment of capital markets in sub-Saharan African countries (SSA) has notably been affected by both macroeconomic and institutional factors. Previous studies have attributed the role of macroeconomic fundamentals to poor performance of market capitalization, with little documentation on institutional dimensions' effect on market capitalization in the sub-region. However, a few similar studies conducted in sub-Saharan Africa are largely country specific. We use six most capitalized and oldest stock exchanges as representative sample for the period 1996 to 2016, to investigate effects of institutional and macroeconomic factors on market capitalization of selected sub-Saharan African countries. We estimate with Static panel regression analysis of Pooled OLS, Fixed Effects, and Random Effects. Our findings provide evidence that institutional and macroeconomic factors have combined significant positive effect on market capitalization on sub-Saharan African countries, while exchange rate and inflation have significant and negative influence on market capitalization, trade openness and foreign direct investment have significant and positive effect on market capitalization. Governments of (SSA) countries should initiate policies that will improve the macroeconomic and institutional environment, thereby improving efficiency of market capitalization for better market performance.

Keywords: *Exchange rate, Inflation rate, Institutional dimensions, Macroeconomic factors, Market capitalization, Trade openness*

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Background to the Study

Stock market plays a key role in the mobilization of capital in emerging and developed countries, leading to the growth of industry and commerce, as a consequence of liberalized and globalised policies adopted by governments in most of these countries. In line with arguments in Bhargava and Konku (2010), today's globalised economy and international financial system; numerous macroeconomic factors affect the fair market value estimate of many companies listed on stock markets. It is generally recognized that a strong financial system guarantees the economic growth and stability. A well-developed stock market can lead to overall positive impact on economic development. Sound macroeconomic environment with low and predictable inflation, high domestic savings and investments support stock market development (Yartey and Adjasi, 2007).

Relative to developed economies, market capitalization of sub-Saharan African countries as a percentage of the gross domestic product have been on a downward trajectory resulting from macroeconomic factors (Aawaar, 2017). Motelle and Biekpe (2015) argued that financial integration, a product of liberalized markets brings about the risk of financial instability resulting in poor performance of market capitalization of South African development community countries, namely South Africa and Zambia. Greater macroeconomic instability of exchange rate, inflation rate fluctuation and weaker institutions were observed in these countries. The Mauritian rupee to the US$ depreciated from 28.45 in 2008 to 35.05 in 2015 while the South African rand to the US$ depreciated from 8.26 in 2008 to 12.75 in 2015 (World Bank, 2016).

Bhattacharya et al (1997) and Kenny and Moss (1998) suggest that institutional factors should create an enabling environment to curb fraud and insider trading. This has the potential to improve the performance of stock exchanges. They also suggest that the development of a healthy domestic base of investors such as pension and mutual funds, with improvement in financial and institutional infrastructure has the potential of attracting a large pool of foreign investments. Similarly, Levine (1999) examines the link between legal environment and financial development, and his findings were that financial intermediaries are better developed in countries with good legal and regulatory systems. The study used micro-level institutions such as creditors' rights, contract enforcement quality, legal origins and accounting standards to proxy for legal and regulatory systems.

Kyereboah-Coleman and Agyire-Tettey (2008) found that macroeconomic policies do influence stock exchange performance. They find that macroeconomic indicators such as rate of inflation, lending rates and exchange rate do affect stock market activities of Ghana. Their study is limited in scope, as only one country (Ghana) was used and also neglected institutional aspects of stock market. This makes our study different from other previous studies that used only one country. In the study of development of stock markets, there is need to broaden the scope by looking at many countries to arrive at stronger conclusion. In a related work, Garcia and Liu (1999) used a pooled panel data approach for the study of Latin and East Asian economies, and provided evidence that macroeconomic factors such as real income, saving rate and level of financial intermediation are significant and important determinants of

stock market development. Naceur et al. (2007) found similar results for a panel of countries in the Middle East and North African (MENA) region. However, they did not evaluate the impact of institutional factors on stock market development.

Law and Habibullah (2009) provide evidence on the influence of institutional quality, trade openness and financial liberalization on financial market development. The overall evidence from their work is for emerging markets to develop adequate institutions and sound macroeconomic policies before undertaking market policy reforms. In this study, we examine effects of institutional and macroeconomic factors on market capitalization of selected SSA countries using static and dynamic panel data estimations.

Our results provide evidence that institutional and macroeconomic factors have significant effect on market capitalization. Our findings from the sample demonstrate the importance of institutional factors on market capitalization of SSA countries. Furthermore, considering the nature of macroeconomic environment in the sub-region, exchange rate and inflation have significant and negative influence on market capitalization while trade openness and foreign direct investment have significant and positive effect on market capitalization.

Theoretical Framework

Several theoretical explanations have been put forward to explain stock price determination which when multiplied by the number of shares gives the market capitalization. Efficient market hypothesis (EMT) relates to the extent or the speed with which stock market prices reflect all publicly available information (Roberts, 1967; Fama, 1970, 1991). The theory claims that the financial markets are as efficient with respect to information that no investor would be able to earn excess return over the average risk adjusted market return. EMH supports the Random Walk Hypothesis, which implies that price fluctuations represent random variations that have nothing to do with previous prices. There are three versions of the EMT regarding the informational efficiency of the market i.e. weak, semi-strong and strong form of EMT. There are three different forms of market efficiency such as weak form, semi-strong form and strong form.

At the dawn of the twenty-first century however, the validity of the Efficient Market Theory in terms of its theoretical foundations and empirical evidence came under sharp criticism. The grounds for the criticism included the fact that the EMH does not take into account investors' rationality assumption, and presence of arbitrage opportunities. Following from this, a number of market anomalies which create excess return opportunities for some market participants have been identified in the literature (Schwert, 2003; Alagidede, 2008).

According to Ross (1976), the expected return on any financial asset can be expressed as the linear function of various macroeconomic variables or theoretical market indices. The asset value can be estimated by summing up all the discounted future cash flows. Ross (1973, 1976),specify that the current price of equity share is approximately equal to the present value of all future cash flows to the equity.

Capital Asset Pricing Model (CAPM) assumed that asset price depends only on market factor. Hence, it is tagged a one factor model. On the other hand, the Arbitrage Pricing Technique/Model (APT) which could be taken as a protest of CAPM believes that the asset price is influenced by both the market and non-market factors such as foreign exchange, inflation and unemployment rates. However, one of the defects or disadvantages of APT in spite of its advancement of asset pricing model is that the factors to be included in asset pricing are unspecified. Further studies by Chen, Roll and Ross (1986); Fama (1981, 1990); Fama and French (1989) and Ferson and Harvey (1991) as supporters of using arbitrage pricing theory (APT) model developed by Ross (1976), indicated that macroeconomic variables like industrial production index, changes in risk premium, changes in interest rate are related to stock prices in the US.

Supporters of the Arbitrage Pricing Theory argue that it offers several major advantages. First, it makes less restrictive assumptions about investor preferences toward risk and return. Second, no assumptions are made about the distributions of securities returns. Finally, the theory is potentially testable because the theory does not rely on the identification of the true market portfolio.

Capital asset pricing model (CAPM), an important asset valuation tool, was developed by Treynor (1961, 1962),Sharpe (1964), Lintner (1965) and Mossin (1966) independently on the work of Harry Markowitz. Such model determines the required rate of return on the asset. CAPM, a true revolution in finance theory which took place in sixties, describes the relationship between market risks and expected returns of all types of assets (Gursoy & Rejepova, 2007).

Capital Asset Pricing Model (CAPM) is not a good descriptive or positive (as opposed to normative) model of returns within stock markets. Critic like Roll (1977) is of the view that market portfolio is impossible to observe and cannot be constructed accurately, also Blume, Crockett, Friend (1973), Odean (1999), Polkovnichenko (2005) posits that investors do not diversify to the extent assumed by the CAPM. Lastly, CAPM does not include other important factors that affect stock returns: Chen, Roll, and Ross (1986).

Institutional Dimensions: Concept and Measurement

The composite country-level institutional index is composed of six dimensions of governance such as (i) voice and accountability, (ii) political stability and absence of violence/terrorism, (iii) government effectiveness, (iv) regulatory quality, (v) rule of law, and (iv) control of corruption (Kaufmann, Kray and Mastruzzi, 2008). These elements, using rating scale, ranging between -2.5 to +2.5 as prepared by World Bank since 1996, are becoming more and more important in international finance and political economy. It is broadly accepted amongst development economists that countries with relatively good institutions tend to grow faster, while countries with relatively bad institutions tend to grow more slowly. Without a well established institution, political risk will increase and this discourages investment to the capital market (Yartey, 2008).

Exchange rate: this is the price of one country's currency (money) in terms of another country's currency (Bhole, 2004). There are basically two types of exchange rates, the real exchange rate (RER) and nominal exchange rate (NER). The real exchange rate indicates the real purchasing power of one currency relative to another currency while the nominal exchange rate is adjusted for changes in the relative purchasing power of each currency since some base period. Various exchange rate regimes are practiced globally, ranging from the extreme case of fixed exchange system to a freely floating regime. Exchange rate is has either fixed or flexible system.

Interest rates: Mojekwu and Ogege (2012) simply defined inflation as a general and continuous increase in the price of goods and services. Inflation affects economies in various positive and negative ways. The negative effects of inflation include an increase in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation were rapid enough, shortages of goods as consumers begin hoarding out of concern that prices will increase in the future. (George & Bariyima, 2015). Positive effects include reducing the real burden of public and private debt, keeping nominal interest rates above zero so that Central Banks can adjust interest rates to stabilize the economy, and reducing unemployment due to nominal wage rigidity.

Trade openness: according to Seyoum, Wu and Lin (2014), trade openness commonly known as the openness index, calculated as (Exports + Imports)/GDP, is a measure of the importance of international trade in the overall economy of a country. A more open country is likely to attract more portfolio flows. Lederman, Mengistae, and Xu (2010) further suggested that economic, legal, and institutional policies and procedures that encourage openness to trade and FDI are required to attract investment and boost international trade.

Foreign direct investment: the Balance of Payments Manual (BPM5) published by the International Monetary Fund in 1993 defines FDI as an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. The International Monetary Fund (IMF) defines Foreign Direct Investment as an investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, and the investor's purpose being, having an effective voice in the management of the enterprise (IMF, 1997).

Market capitalization: according to El-Wassal (2013), a common indicator for assessing stock market size is Market capitalization/GDP, which equals the market value of listed shares divided by the relevant GDP. This indicator has been widely used in the literature as a stable measure of stock market development for two reasons. First, it is a measure of stock market size, which is positively correlated with the ability to mobilize capital and diversify risk. Second, it is presumed to include companies' past retained profits and future growth prospects so that a higher ratio to GDP can signify growth prospects as well as stock market development (Levine and Zervos, 1998).

Empirical Framework

There has been a vast empirical literature on the effect of macroeconomic factors on stock market development in both developed and developing countries. The focus of this paper is on SSA and the addition of institutional factors makes the paper relevant to address some of the recurring issues that constantly affect the stock market that needed some policy actions. In the light of these, most of papers reviewed focused on developing countries as this is the context of the present study. Andrianaivo and Yartey (2010) and El-Wassal (2005) by incorporating various components of political risk to proxy for institutional quality measures found it to be a robust and statistically significant determinant of stock market, which supports the case made by La Porta *et al.* (1998). Conversely, the study by Cherif and Gazdar (2010) on Middle East and North African (MENA) region provides evidence that income level, saving rate, stock market liquidity and interest rate indeed influence stock market development. Measures of institutional environment as captured by composite index of political risk were found to be insignificant determinants of stock market development in this region. The key insights though can be gained by looking into individual components of political risk in relation to their potential impact on stock market development.

With respect to exchange rate variable of macroeconomic factors, Ndako (2013); Raji (2016) using samples of five and six African countries found negative relationship between exchange rate and stock prices is in line with the portfolio balance effect. At specific country level, Micheal (2018); Afshan, Sharif, Loganathan and Jammazi (2014) in Egypt and Pakistan repsectively found that there was a long-term equilibrium between stock prices and exchange rate in Egypt, since the conditions of co-integration were fulfilled. The results in Pakistan confirm the presence of long-run association between stock price and exchange rate.

Alan, Uddin, and Taufigue (2011) seek evidence supporting the existence of market efficiency and exchange rate sensitivity on stock prices in South Africa. Mitra (2017) in the South Africa investigated stock market and foreign exchange market integration. Alan *et al* (2011) sample includes the daily price indices of all securities listed on the JSE, and the exchange rate of the USD/Rand for the period since January 2000 to December 2004 while Mitra (2017) applies the dynamic co-integration technique to time series data and re-examines the short-run and long-run association between the real effective exchange rate and the total value of stock transactions in South Africa over the post-Bretton Woods period 1979–2014. The results from Alan *et al* (2011), the unitroot test, the ADF test and the causality test at the Granger sense provide evidence that the Johannesburg stock exchange (JSE) is efficient information wise. It has a long run co-movement with exchange rate, and long run equilibrium or steady state. Hence, in JSE there is a strong possibility that foreign direct investors and forex market traders cannot influence and gain abnormal extra benefits by using exchange rate mechanism or by using exchange rate to forecast stock prices in the market. Abiola and Ajibola (2017), in Nigeria found that Exchange Rate and Stock price are volatile and the dwindling grossly affects the aggregate output. Also, there is high degree of positive relationship between Exchange rate, Stock Price movement and aggregate output. Some of the results were negatively or positively related to exchange rate.

Abdalla (2012); Kimani and Mutuku (2013); Qamri *et al*(2014) investigating the relationship between inflation rate and stock prices in some African stock markets, found negative relationship the two variables. On the contrary, Emenike and Nwankwegu (2013) on investigating whether stock market returns protect investors against inflation. The result suggests that inflation does not have significant short-term effects on stock returns. The study therefore concludes that the Nigerian stock market protects investors' wealth against inflation in the long-run but not in the short-run. Kimani and Mutuku (2013) investigate the impact of inflation, Central Depository System (CDS) and other macroeconomic variables on the Nairobi stock market performance using quarterly data from the Central Bank of Kenya showed that there is a negative relationship between inflation and stock market performance in Kenya.

A look at the trade openness component of macroeconomic factors revealed a positive and strong complementary relationship between trade openness and capital formation in promoting economic growth (see, Anwar, Shahzadi and Nasreen (2017); Anwar (2017); Sakyi, Commodoreb and Opoku (2014)). Al Nasser, Niroomand and Hajilee (2014) investigated the relationship between financial market development and trade openness. To do this, they developed a long-run and short-run model (a bounds testing approach to co-integration) for 18 emerging economies over the period 1980 to 2011. Assefa (2012), in his research focused on seventeen African countries using Fixed Effect Models (FEM) and System Generalized Method of Moments (SGMM). Openness measure is consistently positive and significantly associated with economic growth.

In Africa and the sub-Saharan region, Mijiyawa (2015) studied what drives foreign direct investment in Africa using an empirical investigation with panel data. The results show the existence of agglomeration effects in FDI activities, meaning that the presence of FDI in a country today is likely to attract more FDI to that country in the future. This was further corroborated by Anyanwu and Yameogo (2015); Milikane and Chitambara (2017); Seyoum, Wu and Lin (2014). In Africa country specific perspective, Nyamrunda (2012), Aigheyisi and Edore (2013); and Omanwa (2013) showed some convergence on the importance of FDI to the economy while the result of Oziengbe (2016) showed negative significance to FDI on economic growth in Nigerian capital market.

Ullah and Wizarat (2016) explored the contribution of stock market development towards economic growth in case of four South Asian economies, India, Bangladesh, Pakistan and Sri Lanka for the period 1990 to 2011. Research tools such as Principal Component Analysis (PCA), Structural Equation Modeling (SEM) through Path Analysis and tests of interactions among variables were used to test for the linear relationships between key variables in the estimated equations. Their results suggest that stock market development leads to economic growth in the long-run as well as in the short run and 88% percent disequilibrium is corrected within one year and the long run equilibrium is achievable in almost one year. While that of Ho and Nijindan (2017) and Acquah-Sam (2016) was time series econometric analyses giving similar results.

Hypotheses Development and model Specification

Our study examined the dynamic relationship between institutional and macroeconomic factors on market capitalization of selected SSA countries. The choice of variables followed the lead provided by Calderon-Rosell (1991), by modifying the Calderon-Rossell model to incorporate other economic and institutional variables that might affect market capitalization. Calderon-Rossell (1991) was the first to develop a partial equilibrium model of stock market growth. To date, this model represents the most serious attempt to lay the foundations of a financial theory of stock market development (Yartey, 2008; EL-Wassal 2013).This choice is further reinforced by the work of Asaolu and Ogunmakinwa (2010), Ali, Rehman, Yilmaz, Khan and Afzal (2010), Aduda, Masila & Onsongo (2012). Beck and Levine (2002), Beck, Demirgüç-Kunt and Levine (2003), Ben Naceur, Ghazouani, and Omrani (2007),Cherif and Gazdar (2010), El-Wassal (2013), Elloit (2008),Garcia and Liu, (1999), Kemboi & Tarus (2012). This frame work suggests that institutional factors, exchange rate, inflation rate, trade openness and foreign direct investment influence stock market capitalization Levine and Zervos, (1998).

H1: Institutional dimensions have positive effect on market capitalization of selected SSA countries

Institutional dimensions measures include control of corruption, government effectiveness, regulatory quality, rule of law, voice and accountability and political stability. Studies that used this proxy include (Cherif & Gazdar, 2010; Lazarov & Slaveski, 2015; Windful, Sapong & Agyei-Nttiamoak, 2016; Yartey, 2010). However, in aggregated form using Principal Component Analysis (PCA), the composite index is found to have positive effect on stock market capitalization. In disaggregated form, some of the dimensions were found to be positive while others are negative Andrianaivo and Yartey (2010). The study hypothesizes that a positive relationship will be found.

H2: Exchange rate has negative effect on market capitalization of selected SSA countries.

Exchange rate measures the value of the local currency against other international currencies, and serves as a measure of macroeconomic stability of a country. Studies using this indicator to measure exchange rate include, Ibrahi & Aziz (2003), Pal & Mittal (2011), Tiang & Ma (2010), Singh, Tripathi & Lalwani (2012), and Ullah, Hussain & Ruaf (2014). Exchange rate is expected to have negative effect on stock market capitalization as the member currencies have been found to be fluctuating against major currencies due the nature of their economies Umer,Sevil& Kamisli (2015).

H3: Inflation rate has a negative influence on market capitalization of selected SSA countries.

Inflation rate is measured by the annual percentage change of consumer price index. It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at yearly intervals. This proxy has been used

in other studies such as Adam & Tweneboah (2008), Boyd, Levine, & Smith, (2001), Coleman & Tettey (2008), Marques, Fuinhas & Marques (2013), Lakshmi & Tuwajiri (2014), Maysami, Howe & Hamzah (2004), Shan, Morris & Sun, (2001). Inflation rate is expected have a negative influence on stock market capitalization. The level of inflation in the SSA countries has been that of double digit. The study therefore hypothesizes that a negative relationship will be found.

H4: Trade openness has positive effect on market capitalization of selected SSA countries.

The sum of exports and imports of goods and services as a share of GDP to measure trade openness. The study hypothesizes a positive relationship with stock market capitalization. Evidence of this has been provided by numerous empirical studies for the regions under review, Aregbesola (2016), Niroomand, Hajilee, &Al Nasser (2014), Rajan & Zingales (2003), Ho, S. (2017). This is particularly important because SSA has embarked on adjustment programmes and trade liberalization over the past two decades and few barriers to trade remain in these regions.

H5: Foreign direct investment has positive influence on market capitalization of selected SSA countries.

FDI is an investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor. Studies using this proxy to measure FDI include Anyanwu & Yameogo (2015) and Boateng, Amponsah & AnnorBaah (2017), Kanu (2011). Global investors are always looking for avenues to invest and SSA seems to be possible destination due to diversification effect. The study hypothesizes that a positive relationship will be found.

To examine more precisely the dynamic relationship between institutional and macroeconomic factors on market capitalization of selected SSA countries, static and dynamic panel data models were estimated for the sample of SSA countries using annual data between 1996 and 2016.

The models use a balanced panel of six SSA countries. The data are annual for the period 1996-2106. As already identified above, this was mainly due to data availability for some of the variables. Many of the stock exchanges in the region started far after our 1996 date. Pooled OLS, fixed effects the random effects estimators were used and the Hausman test was used to accept or reject either of the models. Panel models are valuable for a number of reasons. Firstly, panel data allow both the cross-section and the time series aspects of the data to contribute to the parameter estimates. Secondly, panel data suggest that countries are heterogeneous. Time series and cross-section studies not controlling for this heterogeneity run the risk of obtaining biased results. Not accounting for country-specific differences in economic or behavioural assumptions, such as countries operating under different political systems or more or less restrictive regulations, can cause serious mis-specification in the models. Thirdly, it may be important to incorporate dynamic effects and these models provide a means to study the dynamics of adjustment (Greene, 1997).

The model specifications are described in the subsections below.
Thus, the general specification for a first order autoregressive panel estimation is of the form;

$$Y_{it} = \propto_0 + \propto_1 Y_{i,t-1} + \sum_{k=1} \propto_k X_{k,it} + \mu_i + \varphi_n + \varepsilon_{it} \qquad (1)$$

Where, Y_{it} is the proxy for market capitalization of countries i in year t; $\propto_0$is the constant; $\propto_1$ and $\propto_k$are unknown estimated coefficients; X is a vector of explanatory variables used in the model. μ_i, represents unobserved firm fixed-effects; φ_n represents time-specific effects that are time-variant and common to all countries and $\varepsilon_{it}$is the error term.

From the above expression, it shows that for each specified model, four regressions were estimated. In each hypothesis, the Pooled OLS, fixed effect, Random effect and the dynamic models were specified respectively.

The GMM results were not reported in this study as the estimates and instruments gave some conflicting results. The inconsistency and inefficiency were not surprising considering that GMM fits better for panels with large numbers of cross-section (N) and small time-series (T). However, the fixed effects technique used is known to control for possible heterogeneity. Tests also revealed no statistical mis-specification of the model and no omitted variable bias. Thus, the conclusion can be drawn that the results obtained from the Pooled OLS, fixed effects and random effects estimations are consistent and not spurious.

Data Presentation, Analysis, Interpretation and Discussion
Descriptive Statistics
Table 1: Descriptive Statistics for Institutional, Macroeconomic and Market Capitalization Variables

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
MKTCAP	54.22	23.12	322.66	3.12	74.16	126.00
EXR	40.79	16.33	253.49	0.16	51.13	126.00
FDI	3.00	2.27	9.52	-0.61	2.59	126.00
INF	11.24	9.02	46.56	1.02	7.86	125.00
TOP	56.90	56.97	93.20	17.73	15.68	126.00
CORRP	-1.52	-0.34	0.73	-1.43	7.53	126.00
GOVEF	-0.20	-0.29	1.05	-1.21	0.66	126.00
REGQ	-0.10	-0.22	1.13	-1.35	0.56	126.00
POLST	-0.32	-0.14	1.12	-2.21	0.90	126.00
ROL	-0.23	-0.25	1.08	-1.43	0.71	126.00
VOACC	0.05	-0.12	1.01	-1.55	0.62	126.00
INST	-0.00	-0.27	3.67	-3.54	2.08	126.00

Notes: The table shows the mean, median, maximum, minimum and standard deviation values of the following variables: Market capitalization is defined as the value of listed domestic shares on the domestic exchange divided by GDP (MKTCAP), exchange rate

(EXR), inflation rate (INF), trade openness is the addition of import and export expressed as a percentage of the GDP (TOP), net foreign direct investment as percentage of GDP (FDI). The institutional variables are rule of law (ROL), control of corruption (CORRP), government effectiveness (GOVEF), regulatory quality (REGQ), voice accountability (VOACC), political stability (POLST) and (INST) represents institutional dimensions using principal component analysis to arrive at a single variable for all institutional variables. All the values were calculated from the 126 country-year observations for six sub-Saharan African countries. The estimation process was facilitated using Stata 14.

The mean value of market capitalization is 54.22; this implies that on the average the stock market of the different countries is well capitalized on the average. The maximum value for the market capitalization is 322.66 and the minimum value is 3.72 based on information in the table. These suggest that there is a wide range in the degree of market capitalization among countries. The exchange rate maximum value of 253.49 and the minimum value 0.16, show that the sampled SSA countries have different exchange rate regimes and that there are situations of currency appreciation and depreciations among the countries. The mean value of the inflation rate is 11.24, this suggest that on the average the sampled countries change in the general price level is double digit. The mean value of trade openness is about 56.90 per cent of the sampled countries included in the study. This suggest that majority of the countries were open to international trade. The mean value of the foreign direct investment is 3.00. This value is very low and it suggests that the net inflow of direct investment represents only about 3 per cent of the sampled countries GDP. Thus, the countries need to create enabling environment for the net inflow of foreign direct investment. INT represents the institutional variable using the principal component analysis to arrive at a single variable for all institutional dimensions. The mean value is 0.00 on the average for all the sampled countries. This suggests that rule of law, control of corruption, government effectiveness, regulatory quality, voice and accountability as well as political stability is positive and that better governance is very low in these countries on a scale of 2.5.

Table 2: Explained Variance by Components

Components	Eigenvalue	Proportion	SE_Prop	Cumulative	SE_Cum	Bias
Comp1	4.321	0.720	0.031	0.720	0.031	0.016
Comp2	1.046	0.174	0.024	0.894	0.013	-0.004
Comp3	0.387	0.065	0.010	0.959	0.005	-0.005
Comp4	0.145	0.024	0.004	0.983	0.002	-0.003
Comp5	0.058	0.010	0.002	0.993	0.001	-0.001
Comp6	0.043	0.007	0.001	1.000	0.000	-0.003

Principal Components/Correlation

The correlations between the components with the highest explained variance and the primary variables are reported in Table 2. Overall, the Table shows that all the primary variables are significantly correlated with the component one (1) with the exception of CORRP. However, among the variable that are correlated with the component one (1), ROL

appears to be the most moderately correlated. This is followed by GOVEF and VOACC while CORRP is the least. In other words, the component one (1) is statistically and moderately correlated with five (5) of the primary variables. Furthermore, the significant values of LR tests indicate that the variables are suitable measures of Institutional variable.

Table 3: Principal Components/Correlation

	Coef.
Eigenvalue of Comp1	4.321***
CORRP	0.088
GOVEF	0.456***
REGQ	0.451***
ROL	0.467***
VOACC	0.456***
POLST	0.394***
LR test for independence	906.21 [0.000]
LR test for sphericity	910.70 [0.000]

Estimation Results

The following subsections present and discuss the results obtained from the Pooled OLS, fixed effects, and random effects panel regression.

Table 4: Market Capitalisation and Institutional Dimensions
Dependent Variable: LMKTCAP

Variable	**(1) Pooled OLS**	**(2) Fixed Effect**	**(3) Random Effect**
Panel A			
LINST	0.2827***	-0.0214	0.0674
	(6.45)	(-0.16)	(0.58)
Constant	3.2641***	3.2641***	3.2641***
	(35.96)	(75.03)	(7.35)
Panel B			
R^2	0.2511	0.0002	0.0002
F	41.57***	0.0244	-
Wald Test	-	-	0.338
Hausman Test	-	-	1.470
Observations	126	126	126

Notes: Table 4 reports Pooled OLS, fixed effects, random effects of market capitalization on institutional dimensions. The dependent variable is MKTCAP and INST represents institutional dimensions using principal component analysis to arrive at a single variable for all institutional dimensions such as rule of law, control of corruption, government effectiveness,

regulatory quality, voice and accountability as well as political stability. In Panel A, the *t*-statistics are in parentheses . * ***P-values< 0.10,*** ** ***P< 0.05,*** *** ***P< 0.01***

Table 5: Market Capitalisation and Exchange Rate
Dependent Variable: LMKTCAP

Variable	(1) Pooled OLS	(2) Fixed Effect	(3) Random Effect
Panel A			
LEXR	0.1006*	-0.2135***	-0.1920**
	(1.7)	(-2.65)	(-2.46)
Constant	3.0011***	3.8225***	3.7663***
	(16.12)	(17.81)	(6.72)
Panel B			
R^2	0.0228	0.0559	0.0559
F	2.893*	7.042**	-
Wald Test	-	-	
Hausman Test			169.8***
			1.170
Observations	126	126	126

Notes: Table 5 reports Pooled OLS, fixed effects, and random effects results of the effects of market capitalization on exchange rate. The dependent variable is MKTCAP and EXR is the exchange rate. In Panel A, the *t*- statistics are in parentheses and in Panel B, the probability values are in parentheses. * ***P-values< 0.10,*** ** ***P< 0.05,*** *** ***P< 0.01***

Table 6: Market Capitalization and Inflation Rate
Dependent Variable: LMKTCAP

Variables	(1) Pooled OLS	(2) Fixed Effect	(3) Random Effect
Panel A			
INF	-0.0712***	0.0010	-0.0019
	(-0.601)	(0.41)	(-0.27)
Constant	4.0573***	3.2456***	3.2827***
	(25.00)	(35.76)	(11.10)
Panel B			
R^2	0.2271	0.0002	0.0002
F	36.14***	0.02	-
	(0.000)	(0.8910)	
Wald Test	-	-	0.0707
			(0.7904)
Hausman Test	-	-	10.31***
Observations	126	126	126

Notes: Table 6 reports Pooled OLS, fixed effects, random effects result of the effects of market capitalization on inflation. The dependent variable is MKTCAP and INF is the inflation rate. In Panel A, the *t* statistics are in parentheses and in Panel B, the probability values are in parentheses. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

From table 4 the Pooled OLS result shows that Institutional dimension is positively and significantly related to market capitalization at 1 per cent per cent levels. The positive value of 0.2827 for institutional dimensions is in conformity with the a-priori expectation that increase in institutional dimensions will lead to increase in market capitalization. The implication of this result is that institutional dimensions positively affect market capitalization in the selected SSA countries and that institutional dimension is a significant factor influencing changes in market capitalization. This finding is in agreement with the empirical research of Yartey (2008) that political risk, law and order, and bureaucratic quality are important determinants of stock market development because they enhance the viability of external finance. This finding also supports the view of Ajide, Adeniyi and Raheem, (2014) that the governance dimensions: control of corruption, political stability and government effectiveness matter for the influence of foreign direct investment growth on economic growth in sub-Saharan Africa.

In Table 5, the result of the estimated Random Effect model shows that exchange rate is negatively and statistically related to market capitalization, at 5 per cent level of significance. The implication of this result is that exchange rate negatively affects market capitalization in the selected sub-Saharan African countries. In other words, it indicated that the market capitalization will fall by 19.20% given a 100 per cent increase in Exchange rate. Theory explained that a change in the exchange rate affect a firm's foreign operation and overall profits which would, in turn, affect its stock prices (stock market return) depending on the

multinational characteristics of the firm (Ramli, Samah & Ghani, 2017).This can be explained by the stock-oriented economic theory as captured in the portfolio balance model which postulates a negative relationship between stock prices and exchange rates (Branson, Hulttunen & Masson, 1977).

Going by Pool OLS results, inflation rate is negatively related to market capitalization and statistically significant at 10 and 5 per cent levels. This report is in conformity with theoretical postulations that an increase in the general price level will discourage investors to invest in the capital market. The implication of this result is that inflation rate negatively affects market capitalization in the selected SSA countries. Macmillan (2009), who found out that inflation, has a negative and significant long run influence on the stock market development as it relates to the price. The findings also corroborated the finding of Daferighe and Sunday (2012), Hosseini, Ahmed and Lai (2012) and Omran and Pointon (2010) where the short run and long run effect of inflation was negatively cointegrated with the overall stock market performance. These results support the Fama (1981) hypothesis which states a negative relationship between inflation and stock market performance and that stock prices fail to provide a hedge against inflation.

Table 7: Market Capitalization and Trade Openness
Dependent Variable: LMKTCAP

Variables	(1) Pooled OLS	(2) Fixed Effect	(3) Random Effect
Panel A			
LTOP	-0.0387	0.4522**	0.4460**
	(-0.11)	(2.25)	(2.25)
Constant	3.4190**	1.4553*	1.4799
	(2.41)	(35.76)	(1.55)
Panel B			
R^2	0.0001	0.0409	0.0409
F	0.0120	5.071**	-
	(0.913)	(0.026)	
Wald Test	-	-	4.999**
			(0.000)
Hausman Test	-	-	0.07
			(0.1850)
Observations	126	126	126

Notes: Table 7 reports Pooled OLS, fixed effects, and random effects results of the effects of market capitalization on trade openness. In Panel A, the *t*- statistics are in parentheses and in Panel B, the probability values are in parentheses.
* ***P-values< 0.10,*** ** ***P< 0.05,*** *** ***P< 0.01***.

Table 8: Market Capitalisation and Foreign Direct Investment
Dependent Variable: LMKTCAP

Variables	(1) Pooled OLS	(2) Fixed Effect	(3) Random Effect
Panel A			
LFDI	-0.3031***	0.1342**	0.1260**
	(-3.42)	(2.40)	(2.25)
Constant	3.4524***	3.1830***	3.1932***
	(30.05)	(58.26)	(6.9)
Panel B			
R^2	0.0866	0.0464	0.0464
F	11.67***	5.738***	-
	(0.000)	(0.000)	
Wald Test	-	-	5.062**
			(0.0254)
Hausman Test	-	-	10.61***
			(0.000)
Observations	126	126	126

Notes: Table 8 reports Pooled OLS, fixed effects, and random effects results of the effects of market capitalisation on foreign direct investment. The dependent variable is MKTCAP and FDI is net foreign direct investment. In Panel A, the ***t***- statistics are in parentheses and in Panel B, the probability values are in parentheses.
* ***P-values< 0.10,*** ** ***P< 0.05,*** *** ***P< 0.01.***

In table 7, the estimated Random Effect model, the coefficient of Trade openness is positively and significantly related to market capitalization at 5 per cent levels. The positive value of 0.4460 for trade openness is in conformity with the a-priori expectation that increases in trade openness will lead to increase in market capitalization implying that trade openness positively affects market capitalization in the selected sub-Saharan African countries and that trade openness is a significant factor influencing changes in market capitalization. Niroomand, Hajilee and Al Naseer (2014) investigated the relationship between financial development and trade openness in eighteen emerging countries. Using market capitalization as an indicator for stock market development, were able to find out from all the models a positive significant effect both in the short-run and long-run of trade openness on market capitalization in majority of countries.

In table 8, the result of the Fixed effect model has a positive value of 0.1347 showing that a 100% increase in foreign direct investment will lead to 13.42% increase in market capitalization. This confirms the assertion of Malik (2013) who posits that foreign direct investment significantly and positively affects market capitalization through contegration and granger causality in South Asian countries. The correlations results also show that all the variables are highly correlated in most of the countries.

Further support of the findings with positive effect of FDI on market capitalization and growth of the economy have also been reported by other researchers (Acheampong & Wiafe 2013; Adam & Tweneboah 2008; Bulsara *et al* 2015;Malik & Amjad 2013). The results are also in line with the finding of Choong (2011) Ojo (2012) and that foreign direct investment has a long term positive relationship with market capitalization. The findings of this study are however in contrast with the study of Alege and Ogundipe (2014), using System-GM, the contribution of FDI was insignificant and impacts negatively on growth in ECOWAS despite the controlling for the role of human capital and quality of institutions in the model. Herzer (2012) and Eregha (2012) found negative and significant effect of FDI on market capitalization and economic growth in developing nations of Europe and West Africa sub region respectively. The implication is that FDI crowed out the domestic industries thereby causing more harm to the host economy in dire need of capital to bridge the domestic gap.

Conclusion

The study analysed the dynamic relationship between institutional dimensions and macroeconomic variables on market capitalisation of SSA countries. The study provide answers to prevailing issues in relations to institutional dimensions and macroeconomic factors affecting market capitalisation for the benefit of capital market operators and other stakeholders in the investment process. Six indicators of institutional frame work were identified (control of corruption, government effectiveness, regulatory quality, rule of law, voice and accountability and political stability) and other four macroeconomic factors (exchange rate, inflation rate, trade openness and foreign direct investment) were highlighted on how they affect market capitalization of selected sub-Saharan African countries namely: Nigeria, Ghana, Kenya, Zambia, South Africa and Mauritius. The findings of this study show that institutional dimensions and macroeconomic factors affect market capitalisation of SSA countries.The study finds evidence to support the hypothesis that institutional dimensions have significant and positive effect on market capitalisation of SSA countries. Thus, sound macroeconomic conditions are needed for the performance of market capitalisation of SSA countries good quality institutions are equally indispensible.

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