

The Macroeconomic Determinants of Stock Market Development from an African Perspective

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Abstract

It is widely accepted that a well-functioning financial system is crucial for the development of the economy. As such, it becomes crucial to investigate what the determinants of stock market development are. This would enable policy makers to take the necessary steps to enhance stock market development, which will in turn trigger a much-needed economic growth. This paper therefore aims at identifying the main macroeconomic determinants of stock market by using a dynamic Panel Vector Error Correction Model within a sample of Sub Saharan African countries. The results suggest that economic growth, banking development, stock market liquidity, investment and macroeconomic stability are key determinants of stock market development in the region. Interestingly, the study finds that savings have a significant and detrimental impact on the growth of equity markets in the region. Moreover, results also indicate that economic growth indirectly stimulates stock market development in the short run.

Keywords

Determinants, Stock Market Development, PVECM, Africa

1. Introduction

The importance of financial development on growth has been stressed since very long back [1] [2] [3]. In the recent past however, empirical studies have shifted their focus on whether stock market development in particular boosts economic growth. On the theoretical front, several studies emphasized the importance of the services provided by the stock markets in boosting economic growth either directly or indirectly. Indeed, there are various channels through which stock market

development is believed to enhance economic growth. These include improved liquidity, risk diversification, enhanced mobilization of savings [4], improved dissemination and acquisition of information [5], and, better incentive for corporate control [6]. Moreover, most empirical researches also concede the importance of stock market development in generating gains in terms of economic growth [7]-[14]. Consequently, the next vital question that solicits our attention is: what are the main drivers of stock market development? Indeed, since stock market development is seen to boost economic growth, it would be crucial to identify the main determinants of stock market development as they would stimulate equity growth, which would in turn help trigger a much-needed economic growth. Surprisingly, there is relatively little theoretical and empirical work that has been carried out to scrutinize the determinants of stock market development, especially in developing countries.

2. Literature Review

The determinants of stock market development can be broadly classified into two categories: macroeconomic determinants and institutional determinants. Yartey [15] argues that there are three main measures of institutional determinants. The first measure is the quality of governance. This englobes factors like corruption, political rights, public sector efficiency, and regulatory burdens. The second measure is legal protection of private property and law enforcement, while the third measure relates to the limits on political leaders. On the other hand, macroeconomic determinants focus on factors such as income level, savings, investments, financial development and inflation [15] [16]. Empirically, only a few studies have attempted to investigate the potential determinants of stock market development. Most studies agree that the macroeconomic determinants of stock market development are real income, saving rate, financial development and stock market liquidity [15]-[20]. Other potentially significant macroeconomic drivers of stock market development include inflation [17] [21] and interest rates [18]. However, Şükrüoğlu and Nalin [22] show that inflation has significant negative effects on stock market development, while Kemboi and Tarus [20] show that macroeconomic stability does not play any significant role in generating gains in terms of economic growth. On the other hand, Evrim-Mandaci, Aktan, Kurt-Gumus, and Tvaronaviciene [23] provide evidence that foreign direct investment and worker's remittances also have a positive impact on stock market development. El-Wassal [24] shows that financial liberalization policies and foreign portfolio investments are two other crucial propellers of equity growth. As far as the institutional determinants are concerned, most empirical works suggest that they are political risk, law and order, and bureaucratic quality [15] [19]. The results of Aduda, Masila, and Onsongo [19] also indicate that democratic accountability and corruption index are two other important institutional determinants. Interestingly, Cherif and Gazdar [18] fail to detect any significant link between any institutional factors used and stock market development.

Despite the importance of identifying the determinants of stock market development, there is a surprisingly little number of theoretical and empirical work that has been carried out to answer the question, especially in developing countries. In an attempt to shed more light on the matter, this paper makes use of a dynamic Panel Vector Error Correction Model (PVECM) to find out what the potential determinants of stock market development are within a set of Sub-Saharan African countries during the period 1989-2016. Although both institutional and macroeconomic determinants are important drivers of stock market development, this study follows Garcia and Liu [16] and concentrates solely on the macroeconomic aspect. One of the main reasons for approaching the problem from a macroeconomic perspective is the fact that accurate information on institutional variables is limited for the sample of countries used in this study. Moreover, the choice of the PVECM makes the inclusion of institutional determinants difficult. Apart from adding on to the relatively scarce literature on the determinants of stock market development, this study has several advantages. Indeed, it is believed to depart from and contribute to the existing research in the following ways: Firstly, innovative dynamic panel analysis is employed for this analysis over a period of 28 years. Indeed, the PVECM is an econometric model, which caters for the dynamic nature of the panel data under consideration. It not only treats all the variables as endogenous but also accommodates for the non-stationary features of the data, thereby offering a convenient way to parameterize any co-integration present. Moreover, it allows for unobserved heterogeneity. The model is therefore used extensively to identify the determinants of stock market development while simultaneously allowing identification of any bi-directional and/or uni-directional causality between the variables of interest. Moreover, the PVECM divulges any indirect impacts that the potential determinants might have on stock market development. Additionally, this paper accounts for the fact that financial intermediaries and stock markets are often regarded as being alternative routes for financing investments. Hence, the complementary or substitutability relationship between stock market development and banking development is also considered by including both measures in a unified framework.

3. Methodology

3.1. Model Specification and Data Measurement

In order to determine what the macroeconomic determinants of stock market development are in a set of 14 Sub-Saharan African countries under consideration, annual time series data spanning over a period of 28 years (1989-2016) are used. These 14 countries from the Sub-Saharan African region include Botswana, Cote d'Ivoire, Ghana, Kenya, Malawi, Mauritius, Namibia, South Africa, Swaziland, Nigeria, Tanzania, Uganda, Zimbabwe and Zambia. The countries were selected mostly based on availability of data. This section describes the model adopted and the empirical indicators of the variables of interest used so as to mod-

el the impact of macroeconomic factors on stock market development.

Drawing from models adopted by Gracia and Liu [16], Naceur, Ghazouani and Omran [17], and Yartey [15], who have investigated the macroeconomic drivers of stock market development, the model used in this paper takes the following functional form:

$$MCR_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 TVTSR_{it} + \beta_3 DCTPS_{it} + \beta_4 GFCF_{it} + \beta_5 GDSgds_{it} + \beta_6 INF_{it} + \varepsilon_{it} \quad (1)$$

The paper focuses on the determinants of stock market capitalization ratio (MCR), which is defined as the value of listed shares in the stock exchange divided by GDP. Drawing from Gracia and Liu [16], Naceur, Ghazouani and Omran [17], and Yartey [15], MCR is chosen as the proxy for stock market development. This is favored as opposed to constructing a composite index because it is believed to be a good indicator of the general development of stock markets and less arbitrary than any other index [16]. Moreover, as argued by Demirguc-Kunt and Levine [9], there is a high correlation between individual measures and indices of stock market development.

The logic behind the inclusion of explanatory variables is discussed below:

Economic growth is often recognized as being a key determinant of equity growth. Indeed, according to the demand following hypothesis, the demand for financial services such as stock markets is amplified through an expansion of the economy. La Porta *et al.* [25] illustrate that higher income levels lead to enforcement in legal rights, better education, and improved business environment, which in turn lead to enhanced stock market development. In this study, current GDP is used as a measure of income level [15] [16] [17] [18].

Following Garcia and Liu [16], Naceur, Ghazouani and Omran [17], Yartey [15], and Cherif and Gazdar [18] banking development is captured through domestic credit to private sector expressed as a percentage of GDP (DCTPS). This proxy not only captures the channeling of savings to investors, but also isolates credit issued to the private sector from credit issued to government and public entities. It is included in the model to determine whether it is a complement or a substitute to stock market development.

Moreover, stock markets channel savings to investment projects. As such, a higher level of savings implies a higher level of capital flows through the stock markets. Drawing from Gracia and Liu [16], Naceur, Ghazouani and Omran [17], and Yartey [15], two proxies of savings and investment are included in the model to account for the possibility that savings may not be highly correlated with income in the sample. The proxies are domestic savings as a percentage of GDP (GDS), and gross fixed capital formation as a percentage of GDP (GFCF).

Yet another potential determinant of stock market development is liquidity. Liquid stock markets facilitate long term, risky, and potentially more lucrative investments, which in turn improve capital allocation and long term growth. As such, the higher the liquidity of the stock markets, the higher the amount invested through them and the higher the amount channeled to investment projects. In

other words, a liquid stock market will boost stock market development. In this study, stock market liquidity is captured through total value traded shares ratio, TVTSR, (which is the total value of shares traded on a country's stock exchanges expressed as a percentage of GDP). The same proxy has also been used by Gracia and Liu [16], Naceur, Ghazouani and Omran [17], Yartey [15] and Cherif and Gazdar [18].

Finally, a high volatility in the economic environment is expected to act as a deterrent for savers participating in the stock markets. Moreover, fiscal, monetary and exchange rate policy changes, especially if unexpected, also negatively impact corporate profitability as pointed out by Gracia and Liu [16] and Yartey [15]. As such, stable macroeconomic conditions are expected to promote stock market development. To evaluate the impact of macroeconomic instability on stock market development, this paper uses inflation, INF. Like Şükrüoğlu and Nalin [22], consumer price index is also used to proxy inflation in this paper.

The time series data is extracted from the World Development Indicator database of the World Bank. The specification used in this model is a double log linear one for ease of interpretation, with the value of the estimates to be discussed in percentage terms. By taking log on all variables on both sides of the equation, Equation (1) from above results in the following:

$$mcr_{it} = \beta_0 + \beta_1 gdp_{it} + \beta_2 tvtsr_{it} + \beta_3 dctps_{it} + \beta_4 gfcf_{it} + \beta_5 gds_{it} + \beta_6 inf_{it} + \varepsilon_{it} \quad (2)$$

where i denotes the different countries in the sample, t denotes the time dimension and ε is the white noise disturbance term. The small letters above denote the natural logarithm of the variables.

(From here onwards, the small letters denote the natural logarithm of the variables).

Table 1 below shows the descriptive statistics of the variables.

Table 1. Descriptive statistics.

	mcr	gdp	dctps	gfcf	gds	inf	tvtsr
Mean	2.875603	23.18013	2.957132	2.471197	2.473652	2.313639	-0.241574
Median	2.949541	22.90693	2.765186	2.545703	2.728064	2.190492	-0.267170
Maximum	5.776586	27.06627	5.075953	3.338344	3.895823	10.10279	4.916278
Minimum	-4.679185	20.36217	1.129337	0.850424	-1.648623	-2.676491	-7.793365
Std. Dev.	1.582391	1.337051	0.879682	0.463912	0.924003	1.107060	2.263081
Skewness	-1.162012	0.917442	0.533176	-1.012236	-1.534631	1.122417	-0.191992
Kurtosis	7.230912	3.545697	2.830290	4.351985	5.898708	11.28452	3.761406
Jarque-Bera	320.232	1110.3	8615.0	1.4801	5428.2	88.787	725.57
Probability	0.1520	0.2560	0.2525	0.4770	0.4313	0.7629	0.5196
Sum	557.8671	9086.612	1108.924	711.7047	843.5152	858.3602	-49.52274
Sum Sq. Dev.	483.2648	69-8.9933	289.4161	61.76642	290.2858	453.4651	1044.793
Observations	194	392	375	288	341	371	205

The mean and the median of all the variables are relatively close together, indicating that the variables are potentially normally distributed. An analysis of the skewness of the variables confirms that all the series are almost symmetrical (except market capitalization ratio, investment, saving, and inflation whose values are closer to 1), with their skewness values revolving around 0. When the kurtosis of the data is analyzed, it can be seen that again, most of the series have values relatively close to 3 (except from market capitalization, savings and inflation), which mean that most of the distributions are believed to be rather normal. The Jarque-Bera tests conducted also confirm that the series follow a normal distribution.

3.2. Preliminary Tests

Before proceeding with the estimation of the model to identify the significant determinants of stock market development in the sample of Sub-Saharan African countries under consideration, a few preliminary tests are essential. First, it is important to determine whether the time series under investigation are stationary. To this end, panel unit root tests are used to find the order of integration of the various variables under consideration. ADF-Fisher, PP-Fisher and Levin, as well as Levine, Lin & Chu and Im, Pesaran and Shin W-stat panel unit root tests are applied on the panel series in levels. While Levine, Lin & Chu assume a common unit root, the other unit root tests assume an individual unit root. Overall, the results of all the different unit root tests reject stationarity in favor of a unit root for all the variables¹. This implies that the variables are integrated of order one, that is, they are non-stationary in levels but achieve stationarity after being differenced once.

This being the case, an interesting question arises: Is there a long run equilibrium relationship among the underlying variables. In other words, although non-stationary variables may deviate from each other in the short run, economic forces may act in response to the deviations from equilibrium, thus bringing back their association in the long run. This implies that even though each variable is integrated, there exists a linear combination of the variables that is stationary. In this study, both Johansen Fisher Panel Cointegration Test and Kao Residual Cointegration Test are resorted to in order to verify the presence of a long run relationship among the variables. The results confirm that a cointegrating relationship exists among the variables. Thus, having established the presence of a long run relationship, the study opts for a panel vector error correction model, and proceeds with its estimation.

3.3. Panel Vector Error Correction Model, PVECM

The PVAR is an econometric model that can be viewed as a hybrid of the traditional VAR approach and panel data approach. Panel data VAR thus interestingly combines the traditional VAR approach in a time series, which treats all the variables in the system as endogenous, with the panel data approach, which

¹The preliminary tests have been carried out in the software Eviews 7.

allows for unobserved individual heterogeneity. If only a panel data framework is used, there is a risk of loss of dynamic information as stock market development may have something to do in explaining itself as well [26]. As such, to allow for the possibility of dynamics, endogeneity and reverse causal links between the variables in the model, a panel VAR approach is deemed to be appropriate to capture. Additionally, the model permits the detection of any indirect effects that might be present among the variables. However, since the variables are non-stationary at levels, the PVECM, which accommodates for these non-stationary features by offering a convenient way to parameterize and specify any co-integration present, is used instead. Interestingly, the PVECM specification forces the long run behavior of the endogenous variables to converge to their co-integrated relationships, while simultaneously accommodating for the short run dynamics as well.

The p th order PVECM is specified as follows:

$$\Delta y_{it} = \Pi_i y_{i,t-1} + \Gamma_{i1} \Delta y_{i,t-1} + \dots + \Gamma_{i,p-1} \Delta y_{i,t-p+1} + u_{it} \quad (3)$$

where y_{it} is a vector comprising of all the variables used in the model, i denotes the different countries in the sample, t denotes the time dimension, and u_{it} is a standard white noise process. In this study, an optimal lag length of 2 is chosen based on the Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HIC).

4. Analysis of Findings

Drawing from Garcia and Liu [16], 3 models have been estimated². The long run results of the regressions are displayed in **Table 2** below.

The Long Run Equation

Table 2. Long run estimations of PVECM.

	Model 1	Model 2	Model 3
Stock Market Development, mcr	1	1	1
Economic Growth, gdp	0.14507* [1.65445]	0.846471*** [2.84109]	0.02741* [1.79501]
Banking Development, dctps	0.37744* [1.65363]	0.557385* [1.75811]	0.89635** [2.39218]
Stock Market Liquidity, tvtsr	0.45551*** [2.71946]	1.4171*** [7.15448]	0.60543*** [3.84115]
Savings, gds	-1.72887*** [4.86793]		-1.85013*** [-5.71500]
Investment, gfcf		2.14311* [1.69928]	
Inflation, inf			-0.94963*** [-3.62064]
C	-2.78045	-30.0119	-9.07428

***indicates significance at 1% level, **at 5% and *at 10% respectively. The small letters denotes variables in natural logarithmic and t-statistics are in parentheses.

²All preliminary tests and estimations have been carried out using the software Eviews 7.

The first column considers the determinants of stock market development if only economic growth (gdp), banking development (dctps), stock market liquidity (tvtsr) and savings (gds) are included in the regression model. This model is used as the basic regression. Zooming in on the model, it is found that all the variables are significant. Model 1 shows that income level has a significant role in generating gains in terms of stock market development within the sample of African regions under scrutiny. Indeed, a 1% rise in income level causes a 0.145% rise in stock market development. This is in line with previous studies [15] [16] [18], which also support the fact that income level propels stock market development. Moreover, the regression indicates that banking development, as proxied by domestic credit to private sector actually complements stock market development. Indeed, the positive and significant coefficient of 0.377 implies that if banking development is increased by 1%, then stock market development will shoot up by 0.377%. Similar results are also recorded by Gracia and Liu [16], Naceur, Ghazouani and Omran [17], and Yartey [15]. Moreover, stock market liquidity also has a positive and significant coefficient in the model, thereby highlighting its importance as a macroeconomic determinant of stock market development. A 1% increase in stock market liquidity generates a 0.455% rise in stock market development. This is in line with Garcia and Liu [16], Naceur, Ghazouani and Omran [17], Yartey [15], Cherif and Gazdar [18], Aduda, Masila, Onsongo [19], Kemboi and Tarus [12], El-Nader and Alraimony [21], and, Evrim-Mandaci *et al.* [23]. On the other hand, the regression results indicate that saving has a surprisingly negative and yet significant impact on stock market development. This is contrary to other studies such as that of Gracia and Liu [16], Naceur, Ghazouani and Omran [17], Yartey [15] and Cherif and Gazdar [18]. Although this seems to be counter intuitive, the link between savings and economic growth, and, that between economic growth and stock market development might be a potential explanation for the result. Indeed, an increase in saving would be tantamount to a fall in consumer spending, which then causes a fall in the economic growth of the region. Furthermore, several studies support a bi-directional relationship between economic growth and stock market development in the Sub Saharan African region [27] [28] [29]. As such, combining these two relationships together implies that a rise in savings would actually be detrimental to stock market development. Indeed, if savings is increased, this would lead to a contraction in economic growth, which would in turn cause stock market development to shrink due to the bi directional relationship that exists between stock market development and economic growth.

On the other hand, to test whether investment rate is also a determinant of stock market development, the second regression includes an investment proxy instead of saving rate. Results are displayed in Model 2 of the table above. All the variables are seen to have positive and significant impacts on stock market development. This is consistent with results of model 1. However, the results indicate that, unlike savings, investment is an important determinant of stock market. Indeed, it has a positive and significant coefficient of 2.14, which implies that a

1% increase in investment would simulate a 2.14% rise in stock market development. This is in line with the results of Gracia and Liu [16], Yartey [15] and El-Nader and Alraimony [21].

Finally, in Model 3 of the **Table 2**, a measure of macroeconomic stability (inflation) is added to the basic regression. All the variables are seen to be important driving forces of stock market development, except for savings and inflation. The coefficient of saving remains negative and significant like in Model 1. Moreover, the results indicate that macroeconomic instability, as measured through inflation, is also detrimental to stock market development. Indeed, a rise of 1% in inflation lowers stock market growth by 0.949%. The empirical results of Naceur, Ghazouani and Omran [17] also show that inflation has a negative and significant coefficient. Gracia and Liu [16] have also detected a negative link between inflation and market capitalization, but their coefficient was not significant.

The Short Run Equation.

Table 3 is a composite table, where each column can be viewed and analyzed as an independent function, that is, each column in the table corresponds to an equation in the VECM. The variable named in the first cell of each column is viewed as the dependent variable while the ones listed in the right hand side rows are regarded as the explanatory ones.

The table above shows the short run coefficient estimates of Model 1, along with the t statistics in brackets. From Model 1, we find that the only short run determinant of stock market development is the second lag of economic growth: It has a positive and significant coefficient of 0.635. Results support the fact that it takes time for the impact of the determinants to be felt. Interestingly, a bidirectional causality is detected between stock market development and economic growth. Indeed, both lags of market capitalization ratio are also seen to promote economic growth, with a positive and significant coefficient of about 0.05 in both cases. Additionally, an indirect determinant of stock market development can be extracted from the short run results of Model 1. In fact, stock market liquidity indirectly promotes stock market development through economic growth. Indeed, if last year's stock market liquidity rises by 1%, then, this leads to a 0.033% rise in economic growth. As mentioned previously, increasing economic growth by 1% would cause stock market development to shoot up by 0.635%. Combining these two results together, a 1% rise in liquidity leads to a 0.033×0.635 percentage point increase in stock market development, through economic growth.

Table 4, which displays the short run results of Model 2, shows that banking development is the only variable which is seen to have positive and significant impact on stock market development. Indeed, it is seen that a 1% rise in the first lag of banking development and investment generate a 0.955% rise in stock market development in the short run. A closer scrutiny of the model also reveals that a rise of 1% in the first lag of stock market development causes a 0.042% increase in banking development. The former and the latter observation confirm the presence

Table 3. Short run results of Model 1.

Error Correction	D(mcr)	D(gdp)	D(dctps)	D(tvtsr)	D(gds)
Coint Equation (1)	0.090704*** [2.54608]	-0.009454 [-0.81558]	0.018275 [1.57525]	0.076892 [1.27238]	-0.17242*** [-5.69064]
D (mcr(-1))	-0.029332 [-0.29848]	0.058502* [1.82964]	0.008927 [0.27894]	0.231839 [1.39075]	0.27202*** [3.25458]
D (mcr(-2))	-0.012779 [-0.13980]	0.050093* [1.68438]	0.021313 [0.71605]	-0.029424 [-0.18977]	0.23068*** [2.96731]
D (gdp(-1))	-0.064038 [-0.22429]	0.211972** [2.28173]	0.29610*** [3.18462]	0.367151 [0.75805]	-0.71001*** [-2.92374]
D (gdp(-2))	0.634815** [2.18681]	-0.009958 [-0.10543]	-0.038754 [-0.40996]	0.005886 [0.01195]	-0.378442 [-1.53278]
D (dctps(-1))	-0.347401 [-1.15712]	0.054504 [0.55795]	0.228257** [2.33468]	0.108716 [0.21347]	-0.473367* [-1.85379]
D (dctps(-2))	-0.026354 [-0.09210]	0.014583 [0.15664]	-0.101075 [-1.08477]	-0.729681 [-1.50336]	-0.032979 [-0.13552]
D (tvtsr(-1))	-0.040333 [-0.93737]	0.032932** [2.35228]	0.029620** [2.11395]	-0.091239 [-1.25003]	-0.18131*** [-4.95418]
D (tvtsr(-2))	0.034453 [0.80346]	0.001922 [0.13778]	0.015166 [1.08610]	-0.22019*** [-3.02711]	-0.12830*** [-3.51772]
D (gds(-1))	0.337085 [1.17366]	0.002201 [0.06369]	0.009062 [0.26199]	0.186828 [1.03695]	-0.42289*** [-4.68125]
D (gds(-2))	0.086964 [0.81226]	0.036158 [1.03796]	-0.024033 [-0.68932]	-0.67013*** [-3.68988]	0.055103 [0.60512]
C	-0.075010 [-1.43977]	0.0609*** [3.59235]	2.43E-05 [0.00143]	0.035747 [0.40448]	0.092381** [2.08484]

***indicates significance at 1% level, **at 5% and ***at 10% respectively. The small letters denotes variables in natural logarithmic and t-statistics are in parentheses.

Table 4. Short run results of Model 2.

Error Correction	D(mcr)	D(gdp)	D(tvtsr)	D(dctps)	D(gfcf)
Coint Equation (1)	0.000615 [0.01668]	0.012985 [1.45181]	0.28990*** [3.99465]	0.004529 [0.57026]	-0.02401** [-2.11950]
D (mcr(-1))	0.036991 [0.33301]	0.053858* [1.99978]	-0.175590 [-0.80351]	0.041663* [1.74234]	0.066552* [1.95141]
D (mcr(-2))	0.199906 [1.54554]	-0.044030 [-1.40403]	0.251514 [0.98843]	-0.008295 [-0.29791]	0.068566* [1.72661]
D (gdp(-1))	-0.204474 [-0.46455]	0.391257 [3.66629]	0.253840 [0.29315]	0.230526** [2.43297]	-0.233041* [-1.72448]

Continued

D (gdp(-2))	0.582206 [1.26544]	-0.117172 [-1.05041]	-0.257797 [-0.28482]	-0.030260 [-0.30553]	0.30509** [2.15988]
D (tvtsr(-1))	-0.076564 [-1.38942]	-0.015325 [-1.14701]	0.161283 [1.48774]	0.018375 [1.54905]	-0.04449*** [-2.62988]
D (tvtsr(-2))	-0.035132 [-0.64733]	0.015447 [1.17388]	-0.067288 [-0.63022]	0.015113 [1.29357]	-0.027082 [-1.62530]
D (dctps(-1))	0.954952* [1.88682]	0.051083 [0.41629]	-1.311182 [-1.31686]	0.007705 [0.07072]	0.032698 [0.21042]
D (dctps(-2))	-0.353492 [-0.73322]	-0.286275** [-2.44910]	-0.514425 [-0.54238]	0.125461 [1.20889]	-0.091890 [-0.62080]
D (gfcf(-1))	-0.146210 [-0.40522]	0.152304* [1.74097]	-0.157167 [-0.22141]	-0.110330 [-1.42046]	-0.112532 [-1.01583]
D (gfcf(-2))	-0.166917 [-0.45453]	0.186164** [2.09088]	-0.886642 [-1.22728]	0.023852 [0.30173]	0.014269 [0.12655]
C	-0.027235 [-0.41859]	0.05587*** [3.54164]	0.045162 [0.35282]	0.015005 [1.07133]	0.008015 [0.40122]

***indicates significance at 1% level, **at 5% and ***at 10% respectively. The small letters denotes variables in natural logarithmic and t-statistics are in parentheses.

of a bidirectional relationship between stock market development and banking development. Additionally, this model also reveals that economic growth is an indirect determinant of stock market development. Indeed, economic growth indirectly promotes stock market development through banking development. Results indicate that a 1% rise in economic growth triggers a 0.231*0.955 percentage point rise in stock market development.

As for Model 3 (Table 5), only the second lag of economic growth is found to be a determinant of stock market development. Indeed, it has a positive and significant coefficient of 0.564, which implies that a 1% rise in economic growth propels stock market development by 0.564%. Moreover, this model also shows that the first lag of stock market development boosts economic growth. The coefficient of the first lag of stock market development has a positive and significant value of 0.061. These two results demonstrate that, in the short run, there is a bidirectional relationship between economic growth and stock market development. This is comparable to the results of Model 1. Similar to Model 1, stock market liquidity is again found to indirectly enhance stock market development through economic growth in the short run. Indeed, a 1% rise stock market liquidity leads to a 0.564*0.032 percentage point increase in stock market development, through economic growth.

Table 5. Short run results of Model 3.

Error Correction	D(mcr)	D(gdp)	D(tvtsr)	D(dctps)	D(gds)	D(Inf)
Coint Equation (1)	0.062443*	-0.007074	0.078121	0.012620	-0.1627***	-0.1265***
	[1.78912]	[-0.62431]	[1.38096]	[1.08520]	[-5.75975]	[-3.31911]
D (mcr(-1))	-0.005381	0.061006*	0.278592*	0.027661	0.23738***	0.24874**
	[-0.05251]	[1.83387]	[1.67734]	[0.81014]	[2.86159]	[2.22250]
D (mcr(-2))	-0.000739	-0.040809	-0.054508	0.030906	0.25355***	0.202185*
	[-0.00743]	[-1.26371]	[-0.33807]	[0.93247]	[3.14866]	[1.86097]
D (gdp(-1))	-0.213811	0.182298	0.009763	0.29308**	-0.75853**	-1.0896***
	[-0.68320]	[1.79434]	[0.01925]	[2.81068]	[-2.99410]	[-3.18790]
D (gdp(-2))	0.563822*	0.011569	0.283398	-0.049400	-0.409551	0.610573*
	[1.80916]	[0.11435]	[0.56103]	[-0.47573]	[-1.62337]	[1.79380]
D (tvtsr(-1))	-0.062063	0.03156**	-0.060431	0.03210**	-0.1962***	-0.048727
	[-1.36156]	[2.13278]	[-0.81795]	[2.11368]	[-5.31632]	[-0.97876]
D (tvtsr(-2))	0.043302	0.008118	-0.1892***	0.017901	-0.1494***	0.013369
	[0.95367]	[0.55074]	[-2.57111]	[1.18326]	[-4.06361]	[0.26958]
D (dctps(-1))	-0.343173	0.025284	-0.100835	0.217634**	-0.52990**	-0.237086
	[-1.04;993]	[0.23828]	[-0.19033]	[1.99835]	[-2.00269]	[-0.66413]
D (dctps(-2))	-0.071762	0.019505	-0.528772	-0.117655	-0.040677	0.511571
	[-0.23530]	[0.19700]	[-1.06967]	[-1.15781]	[-0.16476]	[1.53579]
D (gds(-1))	0.395145	0.000532	0.251967	0.014099	-0.4611***	0.201967*
	[1.56033]	[0.01478]	[1.40074]	[0.38128]	[-5.13224]	[1.66625]
D (gds(-2))	0.139004	0.026662	-0.7080***	-0.030902	0.068200	0.150497
	[1.24911]	[0.73802]	[-3.92489]	[-0.83342]	[0.75707]	[1.23823]
D (Inf(-1))	-0.031659	-0.002954	-0.102816	-0.015198	0.140274**	-0.3968***
	[-0.41928]	[-0.12049]	[-0.84009]	[-0.60408]	[2.29488]	[-4.81165]
D (Inf(-2))	-0.036271	0.011733	-0.008054	-0.019086	0.084621	-0.3241***
	[-0.53643]	[0.53450]	[-0.07348]	[-0.84717]	[1.54597]	[-4.38933]
C	-0.045728	0.06220***	0.070154	-0.000563	0.105339**	-0.018167
	[-0.81139]	[3.39997]	[0.76798]	[-0.02998]	[2.30890]	[-0.29514]

***indicates significance at 1% level, **at 5% and ***at 10% respectively. The small letters denotes variables in natural logarithmic and t-statistics are in parentheses.

5. Conclusions

This study tries to investigate what the potential macroeconomic determinants of stock market development are in a sample of Sub Saharan African countries for the years 1989-2016. The empirical analysis depicts five interesting findings. First, the Panel VECM indicates that the main long run drivers of stock market development in the region are economic growth, banking development, stock

market liquidity, and investment. Secondly, the study supports the belief that banking development actually complements stock market development in the long run. Thirdly, the study finds that savings has a significant and detrimental impact on stock market development. This unexpected link might be due to the fact that a rise in savings leads to a fall in economic growth, which in turn translates into a fall in stock market development due to the latter's bi-directional link with economic growth. Fourthly, in the short run, only economic growth and banking development are seen to be significant determinants of stock market development. Moreover, the study also reveals a bidirectional relationship between stock market development and economic growth, as well as between stock market development and banking development in the short run. Finally, in the short run, indirect determinants are also detected. Indeed, stock market liquidity and economic growth are two different channels through which stock market development is triggered indirectly.

The study also unleashes interesting ideas to promote equity growth in the region. Firstly, the positive impact of stock market liquidity on equity market growth that has been detected in the African region suggests that measures have to be taken for the markets in the African region to become more liquid. Unfortunately, African stock markets are notoriously known for having a low market liquidity compared to international norms. There are several avenues that can be explored to spark off the much-needed liquidity. It is believed that the introduction of a wider range of products in the different market segments should be encouraged. Moreover, most foreign investors have been reluctant to invest in the region for fear of the operational risk that relates to the lack of standardization. It is as such important to standardize products. Additionally, the restrictive limits on short selling, which are poorly regarded in Africa, should be eliminated. Indeed, such a step can promote liquidity if it is properly managed and effectively conducted. More retail investors must also be attracted into the market. It is additionally recommended that the number of counters in the exchanges be increased. Unfortunately most counters in Africa are now dominated by listings of brewery, banks and telecom, as opposed to natural resources which are much sought after. Furthermore, the benefits of listing privately held companies should be more aggressively marketed.

Moreover, it is also important to initiate policies to foster economic development and investment in the region so that they can both reach that strategic point where they can significantly direct growth towards equity development. Such measures would in turn fuel economic growth in the region. Additionally, measures should also be taken to promote the banking sector as the development of the latter will simultaneously enhance the development of stock markets in the region. Although competitiveness and innovation have both improved in the region, more effort has to be made to promote financial depth and penetration, which are still low. Moreover, major impediments to financial inclusion have to be curbed to further boost banking development.

On the other hand, domestic savings was seen to be detrimental to equity growth.

To switch this relationship, a better promotion to retail investors about the benefits and returns of investing in stock markets is required. Besides, steps must also be taken to stabilize the political environment. Such measures would decrease the inherent volatility in the stock markets, and as such, the latter will become a more appealing alternative to investing in banks. As for the saving barriers in Africa, they have to be destroyed so that savings can be channeled productively into stock markets and not shallow financial systems.

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