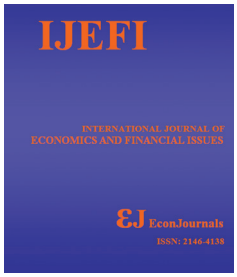

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Interest Rate Liberalization, Quality institutions and Stock Market Development in Selected Sub-Saharan African Countries

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ABSTRACT

The paper examines the long run effects of interest rate liberalization and institutional quality on the development of stock market in seven selected sub-Saharan African (SSA) countries using panel dataset that spans 1990-2013. The study employs dynamic heterogeneous panel method using the technique of pooled mean group. The results reveal that on the average liberalizing the interest rates has a negative long run impact on the development of the stock markets in the seven selected SSA economies. Institutional quality on the other hand has significant positive relationship with the development of stock market. The policy recommendation as a result of this finding is that liberalization of interest rates in the SSA region should be a guided one.

Keywords: Interest Rate, Institutional Quality, Stock Market Development
JEL Classifications: F35, F65, G15

1. INTRODUCTION

Owing to the underdevelopment nature of the countries of the sub-Saharan African (SSA), these countries were advised to restructure their economies under the framework of World Bank and International Monetary Fund supported structural adjustment program (SAP). Financial liberalization was thus recommended as one of the strategies of growing their economies. This concept consists of interest rate; banking sector, stock market; the exchange rate and the capital account liberalization. According to McKinnon (1973) and Shaw (1973), henceforth (M-S), the financial repression feature of the developing countries was responsible for the retardation of growth of the less developed economies. It was recommended that the government should hands off all involvement in the business and economic activities and allows the economies to be market driven. However, empirical support on the positive effects of financial liberalization is weak (Arestis and Demetriades, 1997; Prasad et al., 2005).

Extensive researches have been conducted on the effects of different forms of liberalization in the developing countries and some of them focus on the SSA countries. However, little has been done on the aftermath of interest rate liberalization on the development of stock market in the SSA countries. Analysts have mainly focused on the impact of liberalized interest rate on growth separately from the stock market development. It is against this backdrop that the present study examines the effects of interest rate liberalization and institutional qualities on stock market development in the seven selected SSA economies. The seven countries are: Botswana, Cote d'Ivoire, Ghana, Kenya, Mauritius, Nigeria and South Africa for the period 1990-2013. The choice of these countries is based on data availability and the fact that these countries have embarked on interest liberalization ahead of others in the SSA region. The remainder of the paper is structured as follows: Section two discusses the interest rate liberalization efforts in SSA region. Section three consists of effects of institutional qualities on development of stock market. Section four contains the concept of stock market development and financial liberalization. Section five reviews the literature. Section six is on theoretical framework. Data and methodology is the focus on Section seven. Section eight presents estimation results and interpretation. Section nine concludes the paper.

2. OVERVIEW OF INTEREST RATE LIBERALIZATION EFFORTS IN SELECTED SSA COUNTRIES

In response to the call for financial liberalization, most SSA countries liberalize their interest rates. A common feature among the countries that liberalize their financial sectors is financial crisis. According to Calvo and Reinhart, (1999) 13 out of the sixteen countries of the SSA that embarked on liberalization had financial crisis. Considering the different forms of liberalization the one that is of interest to us in this paper is the liberalization of interest rate with its effects on stock market development. Interest rates liberalization in South Africa started in 1980. Directed credit ceilings were abolished in 1972. There was reversal of the abolished credit ceilings in 1976 before it was removed again in 1977 (Odhiambo, 2010). Interest rate was fully liberalized in 1982 (Fowowe, 2013). The liberalization of interest rates has been successful in South Africa (Odhiambo, 2010). The financial liberalization process in Nigeria was done in phases. Abolishment of directed credit control was done in 1985 (Fowowe, 2013). The SAP of 1987 herald the first phase of financial liberalization in Nigeria. This was when the control on interest rate was totally removed. In 1988, the establishment of foreign exchange bureau by private institutions was done. This is in order to take care of excess demand for foreign currencies and to enhance competition in the foreign exchange transactions (Ikhide and Alawode, 2001).

Kenya adopted partial interest rate liberalization from 1981 to 1989. This was upgraded to full liberalization in 1991; exchange rate was largely liberalized in October 1993 (Ngugi and Kabudo, 1998). Ghana's interest rate liberalization started in 1985 and was intensified in 1987. In 1988, commercial banks removed the minimum lending rates. It was not until 1989 that full liberalization of interest rate was embarked upon in Ghana (Fowowe, 2013). In Mauritius, interest rate was highly liberalized in 1981while the floor on minimum savings deposit rate was removed in 1988. The Central Bank of West African State of the West African Monetary Union which Cote d'Ivoire belongs abolished its preferential discount rate in 1988 (Galbis, 1993). Channel of transmission between interest rate liberalization and stock market development is such that liberalizing the interest rate results to high level of interest. The high interest rate resulting from liberalization makes corporation to seek equity financing rather than debt financing. Increase participation of firms in the equity market leads to larger market size and more trading activities which enhance the development of the exchange (Singh, 1997).

3. EFFECTS OF QUALITY INSTITUTIONS ON STOCK MARKET DEVELOPMENT

Lack of entrenchments of property rights that negatively affect investors' confidence might have adduced for the low level of investors' interest in SSA's stock markets. This inevitably have adverse effects on market size and liquidity. The situation coupled with the fact that enabling environment in form of supervisory and regulatory framework are not conducive for investments. Liberalization is expected to correct the ills of market failure. Financial liberalization can lead to efficiency in resource allocation when financial markets are fully developed and when the contracting environment is such that agents must live with the consequences of their investment decisions; this reduces the moral hazards effect of financial transactions (Obstfeld, 2009). Moreover there were great lapses concerning regulatory and supervisory practices from the authorities in the SSA countries.

The poor regulatory and supervisory control impairs on investors' interests and thus reduces their participation in the market. Strengthening the important of sound institutions Calvo and Reinhart (1999) stated that stock markets in SSA economies could not perform to standard because these stock exchanges have infrastructural deficits. This might have been responsible for the low indices recorded for stock exchanges of the selected SSA economies even years after liberalization. Apart from South Africa, stock market growths in the SSA region have been really low compared to the level of the other developing countries. This is manifested in the statistics on the indices of measuring stock market development computed for some selected SSA countries in comparison with Malaysia. These indices are stock market capitalization scaled by gross domestic product (GDP), stock value traded as a percentage of GDP and the turnover ratio. They are the average values of the stock indices calculated from 2001 to 2012 (Table 1). The theoretical link between institutional quality and stock market development is that the improved institutions like supervisory and regulatory framework due to integration make for better performances of the financial markets (Kaminsky and Schumkler, 2003).

4. CONCEPT OF STOCK MARKET DEVELOPMENT AND LIBERALIZATION THEORY

Stock market development is a multidimensional concept that can be evaluated from the indices of measuring the stock markets such as market size, liquidity, volatility institutional factors (Demirgüç-Kunt and Levine, 1996; El-Wassal, 2013).

Table 1: Average values from (2001-2012) of stock market indices in selected SSA countries and Malaysia

Selected countries	Market capitalization scaled by GDP	Stock value traded as a % of GDP	Turnover ratio
Botswana	32.2	0.9	3.1
Ghana	13.3	0.4	3.1
Kenya	32.2	2.7	8.1
Mauritius	48.9	2.9	6.4
Nigeria	18.6	2.9	14.0
Cote d'Ivoire	22.8	0.5	2.1
Total average of selected SSA without South Africa	168.0	10.3	53.4
South Africa	194.9	95.8	50.9
Malaysia	138.6	40.9	31.2

Source: World Development Indicators, 2015. SSA: Sub-Saharan African, GDP: Gross domestic product

Market size is measured as market capitalization scaled by the GDP. Capitalization entails the number of listed securities in the exchange. Liquidity of the market indicates the extent to which shares can be traded with ease. It is measured through the stock value traded as a percentage of GDP and the turnover ratio which is stock traded as a percentage of market capitalization.

The two indices of stock value traded scaled by GDP and turnover ratio are ways of evaluating liquidity of the stock market. Volatility of the market indicates the extent to which stock return changes overtime. While stock volatility may be desirable because it reveals information about performance of the companies as shown in share prices, excess volatility does not show a better developed stock market (Levine and Zervos, 1998). Other determinants of stock market development are the macroeconomic stability of the country which is measured in per capita income growth. When the level of income increases then the extent that the citizens invest in the stock market also increases. Institutional qualities, human capital development and financial development are the other determinants of stock market development (Yartey, 2008).

The theoretical link between interest rate liberalization and economic growth can be viewed from the perspective that interest rate affects the growth of the financial sector. This is because financial liberalization enhances the efficiency of financial development (Gehringer, 2013). Interest rate liberalization ensures that the rates are market determined in order to stimulate savings that would enhance investment. Increase in investment is expected to gear up growth (McKinnon, 1973; Reinhart and Tokatlids, 2000; Shaw, 1973). The industrial, service and the other sectors of the economies now have access to funds to finance their activities which ginger growth in the real sector. Increase in economic growth therefore leads to better developed stock market since it has been established that part of the determinants of stock market development is economic growth (El-Wassal, 2005; Yartey, 2008).

4.1. Liberalization Theory

Financial liberalization was brought to limelight through the research work of M-S. The authors emphasized that the channel in which financial development can influence growth is through savings-investment. The two writers stressed the importance in the quantity or volume rather than the quality or efficiency of investment. They however use different means of achieving this high volume of investment that lead to growth. McKinnon's approach is directed towards the complementarities hypotheses. Shaw (1973) focused on debt accumulation which is based on inside money acting as loan to the private sector. The liberalization thesis is based on the notion that financially repressed interest rate leads to actualization of inefficient investment projects. This is due to the fact that dearth of investible funds resulting from repressed interest rate would inhibit investment into risky and efficient projects. In the end inefficient low risk investment projects are being substituted for high risk profitable projects. If interest rate is allowed to be market determined, this would attract more savings which would permit the actualization of more profitable investment projects that would promote growth (M-S).

5. REVIEW OF LITERATURE

Analysts have deliberated extensively on the influence of financial liberalization on the efficiency of financial markets. Levine (2001) portends that liberalization through the financial intermediaries permit the smooth functioning of the financial system. This is achievable through the intermediaries reducing the transaction costs and the information asymmetric problems associated with financial markets. More so, liberalization which enhances the liquidity of the stock market promotes diversification of risk which in the end leads to development of the stock market. Lending credence to this notion, Odhiambo (2010) stressed that the liberalization of interest rates working through financial depth is able to affect economic development in South Africa. From the opposing viewpoint Singh (1997) opines that liberalization of interest rate lead to high level of interest forcing corporations to substitute equity financing for debt thereby contradicting the views of M-S. In a situation where information is imperfect, Stiglitz (1994) suggests that government intervention in form of interest rate ceiling may be necessary in order to reduce the problem of moral hazard. This may improve the efficiency of the financial system and may lead to sound financial development. This situation is contrasted to the high real interest rate that results from liberalization which may make the financial market prone to crises thus aggravating the problem of adverse selection. Arestis and Caner (2004) expatiate on the link between interest rate liberalization and efficient allocation of resources. The probability of increased savings resulting from liberalized interest rates to lead to increase investment depends on the sources of these savings. If the source is from formerly unused assets then this may shore up supply of funds and may improve resource allocation. However if the changes in deposit flow from the informal sector to the formal sector, then it may not lead to better resource allocation or increase investment because the formal sectors that the funds are directed to are subject to reserves requirements.

Chinn and Ito (2002) examined the relationship between liberalization and financial development using both credit and equity markets as proxy for financial development. The study employs panel data for the period 1970-1997 for 105 countries. Findings indicate strong relationship between financial openness and financial development and this relationship is strengthened by the existence of investors' protection and accounting standard. In essence, liberalization is more effective with the provision of property right and sound accounting standard. In another development Klein (2005) employing panel data for 71 countries investigate the link between financial openness and growth with the influence of quality institutions. Results show that countries with improved institutions (though not the best institutions) tend to have high rates of growth. Furthermore Yartey (2008) in a panel data of 42 emerging nations for 1990-2004 investigate the determinants of stock market development. The author using Gaussian mixture model technique finds that there is a large effect of quality institutions as measured in political risk and law and order on growth in the countries investigated.

Studies on impact of liberalized interest rates and stock market development is limited. Majority of studies mainly focus on interest

rate liberalization separately from stock market development. Odhiambo (2009) investigated the effect of interest rate reform on financial deepening and growth in Kenya using time-series data from 1968 to 2004 using the technique of cointegration and error correction methods. The author found that interest rate reform has positive impact on financial deepening in Kenya. Odhiambo (2010) using time-series data from 1970 to 2006 analyzed the impact of liberalized interest rates on bank development and economic growth in South Africa. It was discovered that the liberalized interest rate as measured by the deposit rate has significant effect on financial deepening. Sundararajan (1987) examined the influence of interest rates on the productivity of capital on South Korean firms. Results indicate that real interest rate increase the relative reward of capital and thus encouraged a more intensive use of capital and substitution of more capital for labor. Omole and Falokun (1999) analyzed the linkage among interest rates and debt-equity ratio, profitability and turnover of firms in Nigeria. Their results revealed that there is a relationship between interest rate and financing pattern of firms with firms' profitability; and also between interest rate liberalization and the growth of equity markets. Bekaert, Harvey and Lundblad (2003) use annual data for real per capita GDP from 1980 to 2000. The majority of the countries investigated showed larger average economic growth after financial liberalization.

Against this backdrop, the current article is investigating the long run influence of interest rate liberalization and quality institutions as measured in supervisory and regulatory framework on the development of stock market for the seven selected SSA nations.

6. THEORETICAL FRAMEWORK

Based on the theoretical underpinnings of financial liberalization and stock market development discussed previously, the study would adopt Calderon-Rossell (1990) model of stock market as modified by El-Wassal (2005). In the analysis of El-Wassal, stock market was model as the dependent variable proxy by market capitalization. Stock market growth was measured as local currency value of market capitalization. Thus given the model:

$$logS_{it}=\beta_i+\delta_1 logD_{it}+\delta_2 logV_{it}+\delta_3 logL_{it}+\delta_4 logP_{it}+\delta_5 logR_{it}+u_{it} \quad (1)$$

In the existing model (1) of El-Wassal, S_{it} is the dependent variable and it is proxied by stock market capitalization scaled by GDP while all the variables on the right hand side are the explanatory variables.

In view of the previous discussion on the theoretical determination of stock market development, the analytical model for the present study is thus derived by modifying the existing model of El-Wassal (2005) as follows:

$$Mktcap_{it}=\beta_0+\delta_1 Intreslib_{it}+\delta_2 Sturn_{it}+\delta_3 GDPS_{it}+\delta_4 Institu_{it}+\varepsilon_{it} \quad (2)$$

where $Mktcap_{it}$ is stock market capitalization and it is proxy by market capitalization. It is measured in percentage ratio. $Intreslib_{it}$ is the interest rate liberalization, *Sturn* indicates the turnover ratio; *RGDP* is the gross domestic product at (2005) constant prices; *Institu* measures the supervisory and regulatory framework which is the institutional quality; and ε_{it} measures the error term.

7. DATA AND METHODOLOGY

The dataset for the present analysis covers the period 1990-2013 and it is sourced from World Development Indicators 2015. The data for institutional quality is from International Country Risk Guide (ICRG, 2015). The index of interest rate liberalization is computed using the chronology of Kaminsky and Schmukler (2008) (henceforth K-S). The different dates of liberalization of interest rates and stock markets by the individual countries are obtainable from the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions IMF.

Following the chronology of K-S, values are assigned based on the policy of the country whether liberalizing or restricting. Value of "1" means the country is restricting interest rate. A value of "2" indicates that there is partial liberalization and "3" means that there is full liberalization. The essence of computing this index is to show the intensity of liberalization of interest rate.

7.1. Methodology

The paper employs dynamic heterogeneous panel analysis by using the pooled mean group (PMG) technique of Pesaran et al. (1997; 1999) and MG of Pesaran and Smith (1995). The method takes care of slope heterogeneity in panel data analysis. The MG assumes unrestricted coefficients among panel members that is different intercepts, slopes and short run variances among the panel and estimates the average for the entire group in the panel. The traditional fixed effects, which is the dynamic fixed effect (DFE) assumes that the intercepts, slopes and the long run coefficients are the same among the group. PMG technique takes a middle position between the two by allowing the intercepts, slopes and short run variances to be different while restricting the long run coefficients to be similar among the individual panel member. The restriction of similar long run coefficient among the group is of relevance to the present study considering the fact that the seven selected SSA countries have common characteristics as developing countries on the same level of economic development.

The technique assumes similar long run coefficients among the panel members while allowing individual country to have its own intercept, adjustment mechanism and short run coefficients. The PMG approach is in sharp contrast to the DFE that assumes homogeneous long run, short run and adjustment mechanism among panel member while freeing only the intercept to be different among the group in the panel (Bassanini and Scarpetta, 2001; Pesaran et al., 1997; 1999). Assumption of common long run is applicable to the present analysis where the countries being investigated are on the same category of economic development according to World Bank categorization. An advantage of the PMG is that it allows individual countries to have separate adjustment mechanism which is more realistic.

Recent empirical researches show that the PMG has been employed. Blackburne and Frank (2007) use this technique to estimate consumption through income and inflation in 24 OECD countries from 1960 to 1993. Bangake and Eggoh (2012) use the method to examine the relationship between savings and investment rates for 37 African countries for the period 1970-2006. Bassanini and Scarpetta (2001) investigated the effect of human capital development on growth in a panel of 21 OECD countries over a period of 1971-1998 using the PMG technique. The specification of the autoregressive distributed lag (ARDL) equation for $t = 1, 2,\ldots, T$, specific time and $i = 1, 2,\ldots, N$, countries for the dependent variable Y is:

$$Y_{it} = \sum_{j=1}^{P} \lambda_{ij} y_{i,t-1} + \sum_{j=1}^{q} \gamma'_{ij} X_{i,t-j} + \beta_i + \varepsilon_{it} \quad (3)$$

where $X_{i,t-j}$ is the (k × 1) vector of explanatory variable for group i and β_i is the fixed effect $y_{i,t-j}$ is the lagged dependent variable λ_{ij} represents the scalar coefficient of the lagged value of the dependent variable, also γ'_{ij} shows the vector coefficient of the lagged value of the explanatory variable. The model can be re-parameterized as a vector error correction method system:

$$\Delta y_{it} = \varphi_i (Y_{i,t-1} - \varnothing'_i X_{i,t-1}) + \sum_{j-1}^{p-1} \lambda'_{ij} \Delta Y_{i,t-j} + \sum_{j=1}^{q-1} \gamma'_{ij} \Delta X_{i,t-j} + \beta_i + \varepsilon_{it} \quad (4)$$

ϕ_i measures the long run coefficient while φ_i is the error correction mechanism. The technique of PMG main interest is the short run adjustment mechanism and the long run coefficient.

The long run stock market development model is given thus:

$$Mktcap_{it} = \phi_{0i} + \phi_{1t} Intreslib_{it} + \phi_{2t} Sturn_{it} + \phi_{3t} RGDP_{it} + \phi_{4t} Institu_{it} + \varepsilon_{it} \quad (5)$$

where $i = 1, 2,\ldots, N$; $t = 1, 2,\ldots, T$

The ARDL specification of the above equation is:

$$Mktcap_{it} = \beta_i + \partial_{10i} Intreslib_{it} + \partial_{11i} Intreslib_{i,t-1} + \partial_{20i} Sturn_{it} + \partial_{21i} Sturn_{i,t-1} + \partial_{30i} RGDP_{it} + \partial_{31i} RGDP_{i,t-1} + \partial_{40i} Institu_{it} + \partial_{41i} Institu_{i,t-1} + \gamma_i Mktcap_{i,t-1} + \varepsilon_{it} \quad (6)$$

The error correction model of the Equation 6 is thus re-parameterized:

$$\Delta Mktcap_{it} = \varphi_i (Mktcap_{i,t-1} - \phi_{0i} - \phi_{1i} Intreslib_{it} - \phi_{2i} Sturn_{it} - \phi_{3i} RGDP_{it} - \phi_{4i} Institu_{it}) - \partial_{10i} \Delta Intreslib_{it} - \partial_{20i} \Delta Sturn_{it} - \partial_{30i} \Delta RGDP_{it} - \partial_{40i} \Delta Institu_{it} + \varepsilon_{it} \quad (7)$$

where,

$$\varphi_i = -1(1-\gamma_i), \phi_{0i} = \frac{\beta_i}{1-\gamma_i}, \phi_{1i} = \frac{\partial_{10i} + \partial_{11i}}{1-\gamma_i}, \phi_{2i} = \frac{\partial_{20i} + \partial_{21i}}{1-\gamma_i},$$

$$\phi_{3i} \frac{\partial_{30i} + \partial_{31i}}{1-\gamma_i}, \cdots \phi_{4i} = \frac{\partial_{40i} + \partial_{41i}}{1-\gamma_i}$$

In order to establish a long run relationship between stock market development and each of the independent variables, it is expected that the speed of adjustment φ_i would not be zero thus: $\varphi_i \neq 0$. It must also be significant. The approach in the present study is to conduct the estimation using the technique of PMG.

Table 2 contains the estimate results of the DFE, MG and the PMG for all the countries. The theoretical expectation is for both the coefficients of interest rate liberalization and institutional qualities to be positive and significant. The adjustment mechanism should be negative and significant for a long run relationship to be established between stock market development and interest rate liberalization; stock market development and institutional qualities.

8. INTERPRETATION OF RESULTS

The result for the PMG reveals that on average liberalizing the stock market would have adverse effects on the development of the stock market in the long run for the selected SSA countries. 1% increase in the interest rate liberalization index would reduce the development of the stock market by 200% in the long run for the seven selected SSA economies. The result contradicts the findings of Omole and Falokun (1999) that investigated effects of interest rate liberalization on the financing structures of firms in Nigeria. However the result is in conformity with Demetriades and Devereux (1992) that use panel data for 63 developing countries for the period 1961-1990. Result shows negative effect between interest liberalization and investment. Furthermore, 1% increase in the economic growth as measured in RGDP would increase the stock market development by 279% in the long run. In the same manner, 1% increase in the quality of institution would lead to over 300% increase in the development of the stock market in the long run for the selected SSA countries. Stock market liquidity as measured in turnover ratio is significant and positively signed indicating that 1% increase in stock market liquidity would lead to 40% increase in the development of the stock market in the long run for the selected seven nations. The adjustment mechanism which is the error correction is significant and positively signed. Error correction model (ECM) coefficient shows that for PMG 35% of the shock in long run equilibrium between the stock market development and the explanatory variables would be restored within the year. For MG this amount is 75% while it is 38% using the method of DFE. We use the procedure in the appendix to

Table 2: Estimates results of DFE, MG and PMG

Depending variable lMktcap	DFE	MG	PMG
Variables	Coefficient	Coefficient	Coefficient
lintreslib	−0.34 (−0.80)	−0.17 (−0.27)	−2.00*** (−7.03)
lsturn	0.04 (0.31)	0.35 (1.11)	0.40** (3.42)
ldcps	−0.60 (−1.64)	−0.08 (−0.34)	−0.78** (−1.98)
linstitu	1.86** (2.20)	3.05 (1.58)	3.28*** (7.49)
lrgdp	1.35** (2.53)	1.26** (2.96)	2.79*** (6.57)
Cons.	−11.9** (−2.48)	−23.5** (−3.40)	−23.2** (−3.43)
Short run (ec)	−0.38*** (−5.86)	−0.75*** (−7.55)	−0.35** (−3.41)

Values in parentheses are t statistics *** and ** are significant levels at 1% and 5% respectively. PMG: Pooled mean group, DFG: Dynamic fixed effect, MG: Mean group

Table 3: Estimates of individual countries results for PMG

Depending variable lMktcap	Botswana	Cote d I'voire	Ghana	Kenya	Mauritius	Nigeria	South Africa
Variables	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
lintreslib	0.05 (0.16)	0.53 (1.35)	0.11 (0.15)	0.76** (2.27)	0.93** (2.90)	0.07 (0.13)	0.08 (0.12)
lsturn	−0.10 (−0.71)	0.02 (0.25)	0.01 (0.05)	0.12 (1.05)	−0.01 (−0.14)	0.20 (1.33)	−0.08 (−0.35)
ldcps	0.89* (1.89)	1.16* (1.77)	−0.67 (−0.80)	−0.37 (−0.82)	−0.59 (−0.90)	0.63** (2.41)	−0.39 (−0.53)
Institu	−0.53 (−0.70)	−0.53 (−0.86)	−0.92 (−0.32)	−2.25** (−3.29)	−2.03** (−2.63)	−2.03* (−1.82)	−1.60** (−1.99)
lRGDP	0.20 (0.15)	1.56 (1.34)	−8.29* (−1.71)	4.46** (1.99)	−0.41 (−0.15)	−0.56 (−0.43)	−2.52 (−0.79)
Cons.	−6.04* (−1.88)	−10.1** (−2.21)	−28.5** (−3.21)	−57.54*** (−6.16)	−31.2*** (−3.81)	−19.01** (−2.64)	−10.1 (−1.49)
Shortr-run (ec)	−0.09** (−1.97)	−0.15** (−2.35)	−0.43** (−3.47)	−0.85*** (−6.31)	−0.50*** (−4.34)	−0.26** (−2.52)	−0.14 (−1.52)

Values in parentheses are t statistics *** and ** are significant levels at 1% and 5% respectively while * is significant level at 10%. PMG: Pooled mean group

calculate the adjustment period for each of the three techniques. MG has the shortest adjustment period of eight months; DFE follows with 29 months while PMG has the longest adjustment of 32 months.

Table 3 shows the estimate results of individual countries using PMG. Here it is seen that each country has different ECM as proposed by this estimator. Furthermore the time required by each country to attain equilibrium between stock market development and the other explanatory variables is calculated using the individual country's ECM and a benchmark of 70% shock to be eliminated.

Estimates results of individual countries investigation reveal that six out of the seven countries under investigation have the expected results for the adjustment mechanism. South Africa is the only country among the seven that has an insignificant result of adjustment mechanism. Among the countries with significant error correction, Kenya has the fastest adjustment rate covering the distortion in long run equilibrium in just six months. Botswana has the longest adjustment rate of 12 years 7 months. The time of adjustment for other countries are: Cote d'Ivoire - 7 years 4 months, Ghana - 25 months, Mauritius - 19 months and for Nigeria is 3 years 9 months. Furthermore, results of country specific as measured in the constant terms are negative for all the countries and are all significant except South Africa. The implication of this is that individual country's character like political unrest, lack of protection of shareholder's right are adversely affecting the development of the stock market rather than interest rate liberalization.

9. CONCLUSION

General conclusion indicates that liberalizing the interest rates in the selected seven SSA economies would harm the development of the stock markets of these countries in the long run. The result is contradicting theoretical expectation of financial liberalization. It may be revealing the impacts of 2007-2009 World financial crises on the economies of the SSA since we did not consider the effect of this shock in our analysis. Another interesting conclusion from this paper is that the findings mirror the poor quality institutions in the SSA. Improvements in the supervisory and regulatory framework would lead to better developed stock markets.

Specific conclusion in the analysis of individual country's results indicates that Kenya has the fastest adjustment period while Botswana has the longest. It also shows that for all the countries under investigation aside from South Africa, there exist long run relationships between interest rate liberalization and stock market development; and quality institution and stock market developments. Furthermore, country specific effects as measured in constant terms for almost all countries (apart from South Africa) reveal that they are significant. The implication from this is that individual country's characteristics are more important in affecting the development of the stock markets. In this respect the prevalence political instabilities, corruption and poor supervisory and regulatory framework all go a long way to inhibit the development of the stock markets in the region of SSA.

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