

FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: THE EXPERIENCE OF 10 SUB-SAHARAN AFRICAN COUNTRIES REVISITED

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ABSTRACT. The paper examines the long run and causal relationship between financial development and economic growth for ten countries in sub-Saharan Africa. Using the vector error correction model (VECM), the study finds that financial development is cointegrated with economic growth in the selected ten countries in sub-Saharan Africa. That is there is a long run relationship between financial development and economic growth in the selected sub-Saharan African countries. The results show that financial development Granger causes economic growth in Central African Republic, Congo Republic, Gabon, and Nigeria while economic growth Granger causes financial development in Zambia. However, bidirectional relationship between financial development and economic growth was found in Kenya, Chad, South Africa, Sierra Leone and Swaziland. The results show the need to develop the financial sector through appropriate regulatory and macroeconomic policies. However, in Zambia emphasis needs to be placed on economic growth to propel financial development.

1. INTRODUCTION

The nature of the relationship between finance and economic growth has been one of the most debated in the recent past, yet with little consensus. Central to this debate is the question of whether strong economic performance is finance-led or growth driven. The question is germane because the determination of the causal pattern between finance and growth has important implications for policy-makers' decisions about the appropriate growth and development polices to adopt. The fact that strong correlation exists between finance and economic growth has been well documented in the economic development literature. However, previous empirical studies have produced mixed and conflicting results on the nature and direction of the causal relationship between finance and economic growth¹.

In Africa, the most recent studies about the subject include the following: Ghirmay (2004), Agbetsiafe (2004), Abu-Bader and Abu-Qarn (2008), Balamoune-Lutz (2008), Atindehou et al. (2005) and Odhiambo (2007). As it is elsewhere, there is no consensus on direction of causality between financial development and economic growth. For example, the results by Ghirmay (2004) provided evidence in support of finance-led growth in eight out of the thirteen sub-Saharan countries investigated. In the same way, Agbetsiafe (2004) found unidirectional causality running from financial development to economic growth in seven African countries lending credence to finance-led growth hypothesis. Abu-Bader and Abu Qarn (2008) equally provided evidence in support for finance-led growth in Egypt, Morocco and Tunisia. However,

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¹For a detail literature review on the relationship between financial development and economic growth, see Levine, 1997; Odhiambo, 2008; Ang, 2008; Demirguc-Kunt and Levine, 2008) among several others.

Odhiambo (2007) found conflicting results for three Sub-Saharan African countries investigated. He found evidence in support of demand-following hypothesis in Kenya and South Africa while in Tanzania the supply-leading hypothesis was supported. Similarly, Baliaoune-Lutz (2008) obtained mixed results for North African countries. Atindehou et al (2005) however, found weak causal relationship in almost all the twelve West African countries included in their study.

Essentially, given the plethora of reforms implemented in Sub Saharan African countries over the study period and the conflicting results on the direction of causality between finance and economic growth, it is important to revisit the issue of finance-growth nexus in the sub-region. Hence, the objective of this paper is to increase the understanding of the relationship between financial development and economic growth by providing evidence from 10 sub-Saharan African countries using the vector error correction modeling (VECM) approach².

This paper is organized as follows. In section 2, we highlight the key features of financial systems in SSA. Section 3 briefly describes and provides examples of the relationship between finance and growth. Section 4 contains the methodology. Section 5 discusses the results of the analysis. The last section contains the conclusions.

2. OVERVIEW OF FINANCIAL SYSTEMS IN SUB-SAHARAN AFRICA

In this section, we highlight the key features of the financial system in sub-Saharan Africa. It is generally believed that the financial system in sub-Saharan Africa is relatively less developed and diversified compared to other regions of the world (World bank, 1994). As can be seen from Table I, all the selected sub-Saharan African countries lagged behind in all the measures of financial development when compared to the various regions of the world. The interest rate spread which measures the efficiency of financial intermediation is equally high compared to other regions. The two countries with single digit figure are Kenya and Nigeria.

Until the implementation of the reforms in most African countries in the mid 80s, commercial banks dominated the banking system. These commercial banks were largely owned by the government. However, with the reforms in 1980s, new structure has started to emerge. One, the number of banks in the region has increased. As an illustration, the number of commercial banks increased from 213 in 1982 to 245 in 1992. In addition, government ownership of the bank has decreased significantly in most sub-Saharan African countries. Moreover, non-bank financial institutions have begun to play an increasingly important role in saving mobilization. However, owing to limited range of financial instruments and investment opportunities, their assets have typically been concentrated in government securities or deposited at banking institutions, where they have not been mediated for productive investment owing to banks' limited lending operation and portfolio management. Most governments in SSA region embarked on financial sector liberalization in the mid 80s as their financial sector were highly repressed before the reform with selected credit controls and fixed interest rates.

Right now, African countries are working towards integrating with the world economy with liberalized financial system as the key policy instrument for engendering high growth performance. However, in spite the massive liberalization programme embarked upon in many African countries, the fruits of liberalization are yet to be realized in many of these countries. This could be attributed to their failure to meet the basic prerequisites for successful financial reforms that resulted not only in high and increasing inflation but also deteriorating economic performance.

Indeed, for some of these countries it has been extended and recurrent banking crisis, e.g. Nigeria and Kenya. The study by Egbetunde (2009) showed that most of the indicators of financial development were declining from their peaks in the early 90s. Only few countries in SSA actually experienced positive growth in M2/GDP over the period 2000-2005. Many of the

²This paper unlike some previous studies for Africa that adopted two variables case incorporates additional variables as financial development alone might be inadequate enough to spur economic growth. Also, unlike some existing studies that adopted multivariate approach with saving, export and or import etc as additional variables, we used per capita capital stock as potential gains from economic growth from liberalization may depend on the degree to which financial markets and capital stock act as complements.

countries had negative growth in one or two years or even throughout the entire period e.g. Central African Republic and Kenya.

Table I. Financial Depth and Efficiency
in Some Selected Sub-Saharan African Countries (2005)

	Domestic Credit provided by Banking Sector Sector (% of GDP)	Domestic credit to Private Sector (% of GDP)	Liquid Liabilities (M3) as % of GDP	Broad Money (M2) as % of GDP	Interest rate spread (lending minus deposit rate)
Central African Rep.	17	7	18	17	13
Chad	7	3	9	8	13
Gabon	10	9	20	18	13
Kenya	38.4	25.9	40.3	36.9	7.8
Nigeria	9	15	20	19	7
Zambia	22	8	18	17	17
World	164.6	133.8	94.8	95.1	6.5
East Asia and Pacific	121.4	101.1	141.0	130.7	5.5
Middle East and N. Africa	53.6	39.9	70.8	62.9	4.8
Latin America and Caribbean	52.0	27.8	40.7	38.3	7.8
South Asia	57.2	38.7	62.7	58.4	5.9
East Asia and Pacific	121.4	101.1	141.0	130.7	5.5

Source: World Bank, World Development Indicators (2007)

The growth of the African economies has not measured up to expectation with the reforms. The economic growth rate has not been impressive. The GDP growth rates for many of the countries in SSA are far below 5 per cent. In short, limited progress has been made by financial sector reforms in Africa towards improved savings mobilization and intermediation. As observed in the literature, many of the problems associated with the difficulties in the financial sector have their origins in the past poor administration of the region's economy as a whole and the financial sector in particular. This simply suggests that far reaching measures coupled with stable macroeconomic environment must be ensured for the financial sector reforms to yield appropriate fruits in the region.

3. THE RELATIONSHIP BETWEEN FINANCE AND ECONOMIC GROWTH

Three possible relationships between financial development and economic growth are examined here: finance-led growth, growth driven finance, and the two-way causal relationship that is termed feedback. Each relationship will be discussed in turn with empirical evidence provided.

3.1. Finance-led growth. The finance led growth hypothesis postulates that financial development plays a major role in economic growth. The hypothesis contends that financial development has a stimulating impact on the economy. Several channels through which financial development promotes growth in the economy include efficient allocation of capital, mobilization of savings through attractive instruments, lowering of cost of information gathering and presenting among others. Essentially, an efficient financial sector is seen as purveyor of limited credit resources from the surplus units to the deficits. Through this process the financial sector helps to promote efficient allocation of resources. Empirical evidence in support of this hypothesis has been provided in the works of Levine (1997), King and Levine (1993a, 1993b), Rajan

and Zingales (1998), Darrat, (1999), Ghali, (1999), and Luintel and Khan (1999), Arestis et. al, (2001); Jalilian and Kirkpatrick, (2002); Bhattacharya and Sivasubramanian, (2003); Abu-Bader and Abu-Qarn, (2005) and Habibullah and End, (2006).

3.2. Growth-driven finance. In contrast to the finance-led growth hypothesis, scholars such as Robinson (1952), Kuznets (1955) and Stem (1989) have argued that increase in growth generally leads to increased financial development. In the opinion of Robinson (1952), it seems to be the case that where enterprises lead finance follows. Kuznets (1955) equally states that financial markets begin to grow as the economy approaches the intermediate stage of growth process and develop once the economy becomes matured. The argument is that high economic growth generates demand for some categories of financial instruments and arrangement and that financial market effectively respond to these demands and change. Empirical studies in support of growth driven finance include Agbetsiafa (2003), Waqabaca, (2004), Odhiambo (2004) and Odhiambo (2008).

3.3. Feedback. The most interesting scenarios suggest a two way causal relationship between finance and growth. Lewis (1955), one of the ‘pioneers’ of development economic, postulates a two way relationship between financial development and economic growth. This means that financial market develops as a consequence of economic growth which in turn feeds back as a stimulant to real growth. Several studies have equally noted this type of feedback. These include Patrick (1966), Greenwood and Jovanovic (1990), Wood (1993), Greenwood and Bruce (1997) and Luintel and Khan (1999). Other empirical studies that are consistent with the bi-directional causality response are Akinboade (1998), Al-Yousif (2002) and Demetriades and Hussein (1996).

The above theoretical discussion of competing views and empirical evidence illustrate the controversy surrounding finance-growth causality. Moreover, the growth-finance mix is complex among other reasons because government intervention in form of reforms could affect the relationship. This is why it is important to revisit the relationship in the case of sub- African countries.

4. METHODOLOGY

4.1. Data and data sources. The study is carried out for ten sub-Saharan African countries for the period 1980-2005. The ten sub-Saharan African countries covered in the study are Central African Republic, Chad, Congo Republic, Gabon, Kenya, Nigeria, Sierra Leone, South Africa, Swaziland and Zambia³.

In this study, we measured per capita real output as the ratio of real Gross Domestic Product (GDP) to total population (denoted as Y). Financial development (F) is measured as a ratio of broad money ($M2$) to GDP⁴. Real per capita capital stock (denoted as K) is proxied by the ratio of total capital stock to total population⁵. Real interest rate is denoted as (R).

It is believed that other variables could have great impact on economic growth and that their omission could bias the direction of causality between financial development and economic growth. In view of this, we included two control variables: per capita capital stock (K) and real interest rate (R) to avoid simultaneous bias (Gujarati, 1995) in our regressions⁶.

³The ten countries included in the studies were randomly selected from the list of countries in sub-Saharan region.

⁴This standard measure of financial depth has been used extensively in the literature (see World Bank, 1989, Luintel and Khan 1999).

⁵The total capital stock series is constructed from the gross investment figures following the perpetual inventory model. A depreciation rate of 5% and the average growth rate of the initial 3 years are used to generate the initial level of capital stock (see the work of Luintel and Khan, 1999).

⁶Asides, the incorporation of two control variables also helps to make our analysis multivariate as against bivariate. This is important because bivariate causality leads to erroneous causal inferences (see the work of Lutkepohl, 1982; Caporale and Pittis, 1995).

GDP, M2, total population and real interest rate data were obtained from World Development Indicator data base published by World Bank (CD-ROM 2007).

4.2. Multivariate Cointegration Analysis and Error Correction Modeling. Since the cointegration and error correction methodology is in fairly common place and is well documented elsewhere (Banerjee, et. al 1993; Engle and Granger 1987, Johansen 1988; Johansen and Juselius 1990) we provide only a brief overview here. Johansen (1988) multivariate cointegration model is based on the error correction representation given by:

$$\Delta X_t = \mu + \sum_{i=1}^{\rho-1} \Gamma_i \Delta X_{t-i} + \Pi X_{t-1} + \varepsilon_t \quad (4.1)$$

Where X_t is an $(nx1)$ column vector of ρ variables, μ is an $(nx1)$ vector of constant terms, Γ and Π represent coefficient matrices, Δ is a difference operator, and $\varepsilon_t \sim N(0, \Sigma)$. The coefficient matrix Π is known as the impact matrix, and it contains information about the long-run relationships. Johansen's methodology requires the estimation of the VAR equation 1 and the residuals are then used to compute two likelihood ratio (LR) test statistics that can be used in the determination of the unique cointegrating vectors of X_t . The cointegrating rank can be tested with two statistics: the trace test and the maximal eigenvalue test⁷.

4.3. Vector Error Correction Model (VECM). The error correction version pertaining to the four variables incorporated in our study is stated below:

$$\Delta Y_t = \delta_0 + \sum_{i=0}^n \delta_{1i} \Delta Y_{t-i} + \sum_{i=0}^n \delta_{2i} \Delta F_{t-i} + \sum_{i=0}^n \delta_{3i} \Delta K_{t-i} + \sum_{i=0}^n \delta_{4i} \Delta R_{t-i} + \lambda_1 ECM_{t-1} + \varepsilon_t \quad (4.2)$$

$$\Delta F_t = \gamma_0 + \sum_{i=0}^n \gamma_{1i} \Delta F_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta Y_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta K_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta R_{t-i} + \lambda_2 ECM_{t-1} + \varepsilon_t \quad (4.3)$$

where ECM_{t-1} is the error correction term and ε_t is the mutually uncorrelated white noise residual. The coefficient of the ECM variable contains information about whether the past values of variables affect the current values of the variables under study. The size and statistical significance of the coefficient of the error correction term in each ECM model measures the tendencies of each variable to return to the equilibrium. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes. The short run dynamics are captured through the individual coefficients of the difference terms. Financial development (F) does not Granger cause economic growth (Y) if all $\delta_{2i} = 0$, and economic growth (Y) does not Granger cause financial development (F) if all $\gamma_{2i} = 0$. These hypotheses can be tested using standard F statistics (Mehra, 1994)⁸.

5. EMPIRICAL RESULTS

Time series data such as the ones used in this study tend to exhibit either a deterministic and/or stochastic time trend and are therefore non stationary; i. e., the variables in question have, means, variances and covariances that are not time invariant. As pointed out by Engle and Granger (1987), the direct application of OLS or GLS to non-stationary data produces regressions that are misspecified or spurious in nature. Consequently, we tested the variables for a unit root (non-stationarity) using an Augmented Dickey-Fuller test (ADF) (Dickey-Fuller,

⁷As the trace test results follow the same pattern as the maximal eigenvalue test, we only reported the latter to conserve space.

⁸All the same, as pointed out by Choudry (1995), Granger Causality can still exist as long as λ is significantly different from zero.

1981). The results of the stationarity tests at level show that all the variables are non stationary at level⁹. Having found that the variables are not stationary at level, the next step is to difference the variables once in order to perform stationarity tests on difference variables. The results of the stationarity tests on differenced variables confirmed stationarity¹⁰.

Having confirmed that all variables included in the causality test are integrated of order one, the next step is to test for the existence of a cointegration relationship among the variable series using the Johansen-Juselius approach described in the methodology. The cointegration test results are reported in Table II. The results indicate the existence of cointegration between financial depth, per capita real output, real interest rate and per capita capital stock. The maximum eigenvalue statistics reject the null hypothesis of no cointegration at 5 per cent level¹¹. According to N' Zue (2006), when cointegration exists, the Engle-Granger Theorem establishes the encompassing power of the ECM over other forms of dynamic specification. Results of the ECMs as well as the Granger causality tests are presented in Tables IIIa and IIIb below. Since the error correction representation can be used to test for Granger causality, we estimated both equations 2 and 3.

Table II. Result of Cointegration Tests for Ten Countries

Country	Maximal eigenvalue statistics under the HO: rank = r				
	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	
	47.21	29.68	15.41	3.76	5% Critical Value
54.46	35.65	20.04	6.65	1% Critical Value	
Central African Rep.	72.54**	37.02**	18.19*	6.75*	
Chad	78.88**	32.93*	7.38	0.12	
Congo Rep.	54.35*	27.79	8.59	0.43	
Gabon	62.10**	32.95*	10.1	2.02	
Kenya	55.85**	29.47	9.3	0.41	
Nigeria	81.39**	34.84*	7.7	0.23	
Sierra Leone	50.38*	26.72	10.02	1.2	
South Africa	75.75**	39.21**	10.02	0.56	
Swaziland	75.06**	37.97**	11.11	3.06	
Zambia	89.69**	39.68**	16.31*	3.10	

* indicates significance at 5% critical value, ** indicate significance at 1% critical value.

In general, the results show that the error correction terms in both equations are well defined, that is, their associated coefficients are negative and statistically significant at 5%. The coefficient ranges from -0.124 to -0.342 in growth equation of the model while it ranges from -0.108 to -0.192 for finance equation of the model in all the selected sub-Saharan African countries. This indicates a feedback of approximately 34 per cent (for growth equation) of the previous year's disequilibrium and a feedback of approximately 19 per cent (for the finance equation) of the previous year's disequilibrium for all the selected countries in sub-Saharan Africa. The strong significance of the coefficient on ECM supports the conclusion of cointegration.

As evidenced from the standard F-Statistics reported in Tables IIIa and IIIb, there is unidirectional causality in Central African Republic, Congo Republic, Gabon, Nigeria, and Zambia. The results show that financial development Granger causes economic growth in Central African

⁹The only exception is per capita capital stock variable which was found stationary in level for four countries namely Central African Republic, Congo Republic, Gabon and Sierra Leone.

¹⁰Results are not reported here but are available on request from the authors.

¹¹However, in view of the fact that unit root and cointegration tests are valid asymptotically and we have just 26 data points, we further pooled the data and conducted a panel unit root test and panel cointegration test. The results from Levin, Lim and Chu t^* - test; Im, Pesaran and Shin W-test, ADF - Fisher Chi-square, and Phillip - Fisher Chi-square and Hadri Z - test showed that the variables are stationary at first difference. The panel cointegration test (Pedroni Residual Test) using Panel v -statistic, Panel rho-statistic and Group rho-statistic and Group PP-statistic all rejected the null hypothesis of no cointegration at 5 per cent.

Republic, Congo Republic, Gabon, and Nigeria. The results support the findings of Odedokun (1996) for 71 less developing countries. It also corroborates the results of Ghali (1999) for Tunisia and Abu-Bader and Abu-Qarn (2005) for Egypt. In the case of Zambia, the results show that economic growth Granger causes financial development. The results support the findings of Akinboade (1998) for Botswana and Odhiambo (2005) for Tanzania. Essentially the results indicates that financial development promotes economic growth in Central African Republic, Chad, Congo Republic, Gabon, and Nigeria while economic growth promotes financial development in Zambia.

Table IIIa. Granger causality and long run cointegration equation based on vector error correction model¹²

VARIABLES	Central African Rep.		Congo Rep.		Kenya	
	a	b	a	b	a	b
Constant	0.053* (1.81)	-0.007 (- 1.38)	-0.17 (- 0.42)	0.002 (0.364)	0.134*** (3.33)	-0.034 (- 1.44)
ΔY_t	-	-1.538 (- 1.48)	-	3.348* (1.68)	-	-11.392 (-0.53)
ΔY_{t-1}	-0.223 (- 0.46)	-0.020 (- 0.24)	0.947* (1.72)	-0.086 (- 1.02)	-0.734 (- 1.36)	0.471 (1.49)
ΔF_t	-0.297* (-1.95)	-	- 0.311*** (-3.11)	-	1.416 (0.30)	-
ΔF_{t-1}	1.209 (0.95)	-0.365** (-1.97)	-3.980** (-2.30)	-0.104 (- 0.39)	0.541* (1.51)	0.220 (1.05)
ΔK_{t-1}	0.018 (0.47)	0.019** (2.84)	0.064 (1.41)	0.001* (0.02)	0.443** (2.18)	-0.130 (- 1.15)
ΔR_{t-1}	-0.002 (- 0.86)	0.001*** (3.24)	-0.003* (-1.71)	0.001* (0.33)	0.001 (0.76)	0.002** (2.18)
ECM_{t-1}	- 0.202*** (-13.5)	- 0.108*** (-5.68)	- 0.302*** (-13.7)	- 0.116*** (-6.44)	- 0.127*** (-9.77)	- 0.120*** (-15.0)
R^2 Adjusted	0.51	0.64	0.64	0.54	0.68	0.52
F-stat	1.77	8.33	2.35	0.25	3.63**	2.52
F-stat $\{F \rightarrow G\}$	2.04**	-	2.92**	-	3.07**	-
F-stat $\{G \rightarrow F\}$	-	0.77	-	0.30	-	3.91**

However, bidirectional causality was found in Chad, South Africa, Kenya, Sierra Leone and Swaziland. The result shows that financial development and economic growth Granger cause one another. This indicates that financial development and economic growth promotes one another in the countries. The results for Kenya support the findings of bidirectional causality by Wolde-Rufael (2009) but contrary to unidirectional causality found by Odhiambo (2008), Agbetsiafa (2004) and no causality found by Al-Yousif (2002). The results for South Africa are contrary to unidirectional causal flow from growth to finance by Odhiambo (2004).

The short run dynamics are captured by the individual parameters except that of the ECM term. The results show that some of the variables have the expected signs. However, some of the coefficients are not significant. The results show that financial development lagged one value is positively and significantly related to growth in Nigeria and Sierra Leone. However,

¹²For Tables IIIa and IIIb, the asterisks indicated the level of significance: *** 1%, ** 5%, and *10%. Numbers in parentheses are t-statistic. a and b indicated growth equation and finance equation columns respectively for each country. F-stat $\{F \rightarrow G\}$ denotes F-statistics that Finance Granger causes Growth. F-stat $\{G \rightarrow F\}$ denotes F-statistics that Growth Granger causes Finance.

the reverse is the case for Central Africa Republic, Congo Republic and Swaziland. Growth has positive and significant effect on financial development in Congo Republic and Swaziland. The coefficient is negative in Sierra Leone and Chad.

Table IIIa. Granger causality and long run cointegration equation based on vector error correction model (cont.)

VARIABLES	Nigeria		Sierra Leone	
	a	b	a	b
Constant	0.160** (2.18)	-0.007 (- 0.38)	-0.120 (- 1.07)	0.043** (2.19)
ΔY_t	-	0.618 (1.09)	-	4.519 (0.84)
ΔY_{t-1}	0.385 (0.97)	0.028 (0.29)	1.600*** (3.25)	-0.179** (-2.05)
ΔF_t	-0.89*** (-6..97)	-	- 1.267*** (-6.64)	-
ΔF_{t-1}	3.961** (2.69)	-0.102 (- 0.28)	3.914** (2.37)	-0.628** (-2.14)
ΔK_{t-1}	-0.125 (- 1.20)	-0.002 (- 0.11)	-0.203 (- 0.92)	0.042 (1.09)
ΔR_{t-1}	-0.008** (-2.97)	0.004 (0.60)	0.001 (0.45)	-1.004 (- 0.07)
ECM_{t-1}	- 0.342*** (-7.28)	- 0.132*** (-3.57)	- 0.180*** (-3.33)	-0.19*** (-19.21)
R^2 Adjusted	0.69	0.63	0.55	0.58
F-stat	3.70	0.19	4.52	1.93
F-stat $\{F \rightarrow G\}$	2.42**	-	3.32**	-
F-stat $\{G \rightarrow F\}$	-	0.77	-	3.31**

Per capita capital stock has positive and significant effect on growth in Kenya and Chad. In the same way, it is positively related to financial development in Central African Republic and South Africa. However, evidence of negative relationship between per capita capital stock was found in Chad and Gabon. Interest rate variable has perverse influence on growth in Congo Republic, Nigeria and Chad while it has positive and significant impact on financial development in Central African Republic, Kenya, Chad and Zambia.

In general, several factors might account for differences between countries in the direction of causality between financial development and economic growth as well as their short run effects. One, different institutional structural frameworks and policies followed by the countries under consideration. Two, divergences in the level of macroeconomic stability, prudential and regulatory and supervisory framework entrenched in these economies. And three, the different success outcomes of the reforms in the 90s in the selected countries¹³.

¹³However, it is important to note that the reasons advanced for the different direction of causality and the impact of the variables in our work are only suggestive. Hence, ascertaining and finding those factors that can help to explain the disparity is another line of inquiry that will enhance our understanding of the nature of the relationship between financial development and economic growth.

Table IIIb. Granger causality and long run cointegration equation based on vector error correction model

VARIABLES	Swaziland		South Africa		Chad	
	a	b	a	b	a	b
Constant	0.112 (0.83)	-0.008 (- 0.11)	0.034 (0.32)	0.127 (1.41)	0.078** (2.72)	-0.007* (1.63)
ΔY_t	-	1.412*** (4.37)	-	-0.193 (- 1.29)	-	-8.515** (-2.41)
ΔY_{t-1}	-0.051 (- 0.04)	0.134 (0.18)	0.691 (0.76)	-1.338 (- 1.45)	-0.531** (-2.36)	0.136*** (3.95)
ΔF_t	- 0.936*** (-6.84)	-	- 1.044*** (-4.66)	-	- 1.164*** (-4.38)	-
ΔF_{t-1}	0.504 (0.83)	-0.079 (- 0.23)	-0.075 (- 0.33)	0.081 (0.35)	1.094 (0.95)	-0.084 (- 0.48)
ΔK_{t-1}	0.153 (0.60)	-0.098 (- 0.66)	-0.030 (- 0.25)	0.240* (1.92)	0.044* (1.52)	-0.007* (-1.68)
ΔR_{t-1}	0.003 (1.32)	-0.001 (- 0.99)	-0.001 (- 1.30)	0.001 (1.15)	-0.005** (-2.55)	0.0006** (2.14)
ECM_{t-1}	- 0.145*** (-3.02)	- 0.146*** (-16.2)	- 0.124*** (-6.20)	- 0.121*** (-5.50)	-0.133** (-2.83)	- 0.112*** (-16.0)
R^2 Adjusted	0.51	0.52	0.64	0.54	0.56	0.53
F-stat	0.76	0.54	3.86	1.18	3.45	4.23
F-stat $\{F \rightarrow G\}$	3.32**	-	4.52**	-	9.32**	-
F-stat $\{G \rightarrow F\}$	-	3.34**	-	2.19**	-	3.88**

VARIABLES	Gabon		Zambia	
	a	b	a	b
Constant	0.012 (0.31)	0.003 (0.81)	0.412** (2.81)	0.055* (1.63)
ΔY_t	-	-0.236 (- 0.10)	-	-20.865 (-0.91)
ΔY_{t-1}	0.494 (0.76)	-0.115* (-1.73)	-0.466 (- 0.779)	-0.196 (- 1.43)
ΔF_t	0.125 (1.39)	-	-0.716** (-2.65)	-
ΔF_{t-1}	-1.141 (- 0.37)	-0.109 (- 0.35)	1.286 (1.13)	-0.407 (- 1.53)
ΔK_{t-1}	0.032 (1.09)	-0.005* (-1.68)	0.340 (1.31)	0.024 (0.41)
ΔR_{t-1}	-0.001 (- 0.46)	0.0002 (1.16)	0.001 (0.28)	0.001* (1.93)
ECM_{t-1}	- 0.138*** (-7.67)	- 0.135*** (-11.2)	- 0.168*** (-6.22)	- 0.106*** (-4.68)
R^2 Adjusted	0.59	0.66	0.72	0.56
F-stat	0.62	2.39	11.51	2.47
F-stat $\{F \rightarrow G\}$	2.84**	-	1.05	-
F-stat $\{G \rightarrow F\}$	-	1.12	-	7.68**

6. CONCLUDING REMARKS

This paper investigates the long run and causal relationship between financial development and economic growth for ten sub-Saharan African countries using multivariate Granger causality test within the context of VECM framework. Long run cointegrating relationship among the series could be detected for all the ten (10) countries selected for this study.

Granger causality test within the VECM framework shows unidirectional relations running from financial development to economic growth in Central African Republic, Congo Republic, Gabon, and Nigeria while causality runs from economic growth to financial development in Zambia. However, within the same framework, the results show bidirectional causality between financial development and economic growth in Chad, South Africa, Kenya, Sierra Leone and Swaziland. What lessons can be drawn from these results? One, in countries where evidence shows unidirectional Granger causality running from financial development to economic growth, efforts must be made to enhance improvement and efficiency of the financial sector markets which will in turn accelerate economic growth of the countries. However, in country where Granger causality runs from economic growth to financial development, the government of the country has to intensify efforts on policies that will enhance growth which will in turn improve financial sector development of the economy.

Moreover, in countries where evidence of bi-directional causality between financial development and economic growth was found, policies designed to enhance efficiency of the financial sector and economic growth would be mutually beneficial. Such policies could entail consolidation and improvement on current growth and investment patterns in these economies to improve development of financial markets which in turn will engender economic growth. Moreover, measures such as liberalization of the financial system and the consolidation of the banking system would have significant positive effect on the growth of these economies.

In general, the evidence from the study suggests that policy makers in the continent should encourage financial market development through appropriate mix of taxes, legal and regulatory policies to remove barriers to financial markets operation and thus enhance their efficiency. In short, further opening up of the financial sectors of these economies would no doubt enhance the efficiency of the sector with positive effect on their growth rates.

Finally, it is important to note that presently many of the reforms are now being implemented in some sub-Saharan African countries. However in spite of the reforms, anecdotal evidence still suggests that financial systems remain relatively underdeveloped compared to other regions of the world. Moreover, financial systems in almost all the selected countries still face many of the pre-2005 problems the terminal date of our study. Hence, one could say that the findings of the study are still highly relevant for the present situation in the selected countries.

REFERENCES

- [1] Abu-Bader, S. and Abu-Qarn, A. M. (2005). Financial development and economic growth: time series evidence from Egypt, Discussion Paper No. 05-14a Monaster Centre for Economic Research, Ben-Gurion University of Negev, Israel.
- [2] Abu-Bader, S. and Abu-Qarn, A. M. (2008). Financial development and economic growth: empirical evidence from MENA countries. *Review of Development Economics* 12, 803–817.
- [3] Agbetsiafa, D. K. (2003). The finance growth nexus: evidence from sub-saharan Africa. *International Advances in Economic Research* 9, 172–189.
- [4] Agbetsiafa, D., (2004). The finance growth nexus: evidence from Sub-Saharan Africa. *Savings and Development* 38, 271-288.
- [5] Akinboade, O. A. (1998). Financial development and economic growth in Botswana: a test for causality. *Savings and Development* 22, 331-348.
- [6] Al-Yousif, Y. K. (2002). Financial development and economic growth: another look at the evidence from developing countries. *Review of Financial Economics* 11, 131–150.
- [7] Ang, J. B. (2008). Survey of recent development in the literature of finance and growth. *Journal of economic Surveys* 22, 536–576.
- [8] Arestis, P; P. Demetriades and K. Luintel (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking*, XXXIII: 16–41.

- [9] Atindehou, R. B., J. P. Gueye and Amenounve, E. K. (2005). Financial intermediation and economic growth: evidence from Western Africa. *Applied Financial Economics* 15, 777-790.
- [10] Balamoune-Lutz, (2008). Financial development and income. *International Advances in Economic Research* 14, 422 - 432.
- [11] Banerjee, A., Dolado, J. J., Galbraith, J. W., and Hendry, D. F. (1993). *Cointegration, error correction, and econometric analysis of non-stationary data*. Oxford: Oxford University Press.
- [12] Bhattacharya, P. and Sivasubramanian, M. (2003). Financial development and economic growth in India: 1970-1971 to 1998-1999. *Applied Financial Economics* 13, 925 - 929.
- [13] Caporale, G.M. and Pittis, N. (1995), Causality inference in bivariate and trivariate systems: some more results. Discussion paper No. DP15 - 95, Centre for Economic Forecasting, London Business School.
- [14] Choudry, T. (1995). Long-run money demand function in Argentina during 1935-1962: evidence from cointegration and error correction models. *Applied Economics* 27, 66 - 167.
- [15] Darrat, A. F. (1999). Are financial deepening and economic growth casually related? Another look at the evidence. *International Economic Journal* 13, 19 - 35.
- [16] Demetriades P.O. and Hussain, K.A. (1996), Does financial development cause economic growth? Time series evidence from 16 countries. *Journal of Development Economics* 51, 387 - 411.
- [17] Demircug-Kunt, A. and Levine, R. (2008). Finance, financial sector policies, and long-run growth. Policy Research, working paper 4469. The World bank Development Research Group, Finance and Private Sector Team. January.
- [18] Dickey, D. and Fuller, W. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica* 49, 1057 - 1072.
- [19] Egbetunde, T. (2009), Financial intermediation and economic growth in sub-Saharan Africa (1980-2005). M. Sc thesis, Obafemi Awolowo University, Nigeria.
- [20] Engle, R. F. and Granger, C. W. J. (1987). Cointegration and error correction: representation, estimation, and testing. *Econometrica* 55, 252 - 276.
- [21] Ghali, K. H. (1999). Financial development and economic growth: the Tunisian experience. *Review of Development Economics* 3, 310 - 322.
- [22] Ghirmay, T. (2004). Financial development and economic growth in Sub-Saharan African countries: evidence from time series analysis. *African Development Review* 16, 415 - 432.
- [23] Greenwood, J. and Bruce, S. (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamic and Control* 21, 145 - 181.
- [24] Greenwood, J. and Jovanovic, B (1990), Financial development, growth, and the distribution of income. *Journal of Political Economy* 98(5), 1076 - 1107.
- [25] Gujarati, D. (1995). *Basic econometrics*. New York: Mcgraw-Hill.
- [26] Habibullah, M. S. and End, Y. (2006). Does financial development cause economic growth? A panel data analysis for the Asian developing countries. *Journal of the Asian Pacific Economy* 11, 377 - 393.
- [27] Jalilian, H. and Kirkpatrick, C. (2002). Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics* 7, 97 - 108.
- [28] Johansen, S. (1988) Statistical analysis of cointegrating vectors. *Journal of Economic Dynamics and Control* 12, 231 - 254.
- [29] Johansen, S. and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to demand for money. *Oxford Bulletin of Economics and Statistics* 52, 169 - 210.
- [30] King, R.G. and Levine, R. (1993a), Finance, entrepreneurship, and growth: theory and evidence, *Journal Monetary Economics*, 32(3), 513-42.
- [31] King, R.G. and R. Levine (1993b), Financial and growth: Schumpeter might be right. *The Quarterly Journal of Monetary Economics*, XXXII: 513 - 42.
- [32] Kuznets, S. (1955), Economic growth and income inequality. *American Economic Review* 45, 1-28.
- [33] Levine, R. (1997), Financial development and economic growth: views and agenda. *Journal of Economic Literature*. 35, 688-726.
- [34] Lewis, W. A. (1995). *The theory of economic growth*. London: Allen and Unwin.
- [35] Luintel, K. B. and Khan, M. (1999), A quantitative reassessment of the finance-growth nexus: evidence from a multivariate VAR. *Journal of Development Economics*, 60, 381-405.
- [36] Lutkepohl, H. (1982), Non-causality due to omitted variables. *Journal of Econometrics*, 19, 367-378.
- [37] Mehra, P.Y. (1994), Wage growth and the inflation process: an empirical approach, in B.B. Rao (ed.), *Cointegration for the Applied Economist*, 147-59, New York: St Martin's Press.
- [38] N'zue, F.F. (2006), Stock market development and economic growth: evidence from Cote D'Ivoire. *African Development Review* 18(1), 123-143.
- [39] Odedokun, M. O. (1996), Alternative econometric approaches for analyzing the role of the financial sector in economic growth: time-series evidence from LDCs. *Journal of Development Economics* 50, 119 -146.
- [40] Odhiambo, N. M. (2004). Is financial development still a spur to economic growth? A causal evidence from South Africa. *Savings and Development* 28, 47 - 62.

- [41] Odhiambo, N. M. (2005), Financial development and economic growth in Tanzania: a dynamic causality tests. *African Finance Journal* 9, 1 – 17.
- [42] Odhiambo, N. M. (2007), Supply-leading versus demand-following hypothesis: empirical evidence fro SSA countries. *African Development Review* 19, 257 – 280.
- [43] Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: a dynamic causal linkage. *Economic Modelling* 25, 704 – 713.
- [44] Patrick, H.T. (1966), Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change* 14, 174-89.
- [45] Rajan, R. G. and Zingales, L. (1998), Financial dependence and growth. *American economic Review* 88, 559 -86.
- [46] Robinson, J. (1952). *The civilizations of the general theory, in: the rate of interest and other essay*: London. Macmillan Press.
- [47] Stem, N. (1989). *The economics of development: a survey*. *The Economic Journal*, 597-685.
- [48] Waqabaca, C. (2004) *Financial development and economic growth in Fiji*. Working Paper 2004/03. Economics Department Reserve Bank of Fiji.
- [49] Wolde-Rufael, Y. (2009). Re-examining the financial development and economic growth nexus in Kenya. *Economic Modelling* 26, 1140 – 1146.
- [50] Wood, A. (1993) *Financial development and economic growth in Barbados: causal evidence*. *Savings and Development* 17, 379 – 380.
- [51] World Bank (1989), *World Development Report 1989, Financial systems and development*, New York: Oxford University Press.
- [52] World Bank (2007), *World Development Indicators*, CD-ROM.
- [53] Xu, Z. (2000), Financial development, investment, and growth. *Economic Inquiry* 38, 331-344.