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Nicholas M. Odhiambo[1], Sheilla Nyasha, Mulatu F. Zerihun and Christian Tipoy

Abstract

In this paper, we examine the dynamic causal relationship between financial development and economic growth in French- and English-speaking African countries during the period 1990-2014 – using a trivariate panel Granger-causality model. The study uses three proxies of financial development, namely: liquid liabilities (FD1), deposit money bank assets (FD2), and bank deposits (FD3) to examine this linkage. Our results show that the causality between financial development and economic growth differs significantly between English-speaking countries and French-speaking countries. When FD1 and FD3 are used as proxies for financial development, a demand-following response is found to predominate in both French- and English-speaking countries. However, when FD2 is used as a proxy, the study found a unidirectional causal flow from financial development to economic growth to prevail in French-speaking African countries, but failed to find any causal relationship between financial development and economic growth in English-speaking countries in either direction.

Keywords: Financial Development; Economic Growth; French-Speaking African Countries; English-Speaking African Countries; Panel Granger-Causality

JEL Classification Code: E2, G2, O1

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1. INTRODUCTION

Financial development (i.e. financial depth) is measured by macroeconomic variables such as domestic credit to the private sector as a percentage of GDP, money supply measures, and stock market indicators, among others. On other hand, financial inclusion – its probable cousin – is measured by three qualitative dimensions recommended by the Group of 20 countries (G20), namely: (i) access to financial services; (ii) usage of financial services; and (iii) the quality of products and service delivery. It can be argued that financial development is a precursor of financial inclusion. Thus, there must be financial development for one to have access to financial services.

The causal relationship between financial development and economic growth has been a subject of interest among both economists and policy makers alike during the past decades. It has also attracted a plethora of empirical studies from both developed and developing countries. To date, four different views have been advanced on the causal relationship between financial development and economic growth. The first view is commonly referred to as the supply-leading phenomenon response, and it is largely supported by the neoclassical economists. According to this view, the financial sector precedes and induces real growth by channelling scarce resources from small savers to large investors according to the relative rate of return (see Jung, 1986). This view has been widely supported by McKinnon (1973), Shaw (1973), and King and Levine (1993), among others. The second view, which is popularly known as the demand-following response, is the converse of the first view. According to this view, it is economic growth that leads to financial development. This view can be traced back as far as 1952, when Robinson challenged the supply-leading wisdom, which was dominant at that time. According to Robinson (1952), it is the development of the real sector of the economy (i.e., economic growth) that

precedes the development of the financial sector. This is supported by her causality view, which suggests that, "where enterprise leads finance follows" (Robinson, 1952: 86).

According to Patrick (1966), the direction of causality between financial development and economic growth changes over the course of development. A supply-leading response is usually expected to take place at the early stages of economic development – because financial development is expected to induce real innovation of investment before sustained modern economic growth gets underway. However, as modern economic growth occurs, the supply-leading impetus gradually becomes less and less important while the demand-following response becomes dominant (Patrick, 1966: 177).

Between the supply-leading and demand-following views, there exists a middle-ground view that argues that both financial sector development and economic growth Granger-cause each other. In other words, this view maintains that there is bidirectional causality between financial development and economic growth. This view was strongly supported by Lewis (1955), who suggested a two-way relationship between financial development and economic growth where financial markets develop as a consequence of economic growth and, in turn, act as a stimulus to real growth.

Contrary to these three views, which support a causal relationship between financial development and economic growth, there is a fourth view that argues that these two macroeconomic variables are not causally related at all and any causal relationship between them could be merely a coincidence rather than a causal linkage. Put slightly differently, this view asserts that financial development and economic growth are neutral with respect to each other, and hence, they have no significant effect on the other (see also Lucas, 1988; Graff, 1999).

Despite the numerous empirical studies that have been conducted on the finance-growth nexus, the direction of causality between these two policy variables remains unclear. Previous studies have shown that the causal relationship between financial development and economic growth differs from country to country and is time-dependent. Specifically, it has been found that the causal relationship between these variables is sensitive to a country's level of financial and economic development. Countries whose financial sectors are still at a developmental stage have been found by some studies to portray a finance-led growth response (i.e., supply-leading phenomenon), while countries whose financial systems are at an advanced stage have been found to support a demand-following response.

Although many empirical studies have been conducted on the causal relationship between financial development and economic growth involving a number of African countries, some of these studies suffer from a number of methodological deficiencies. Firstly, some of the previous studies over-relied on a bivariate causality model, which has been found to suffer from the omission-of-variable bias. The introduction of one or more additional variables – affecting both financial development and economic growth in the bivariate-causality setting – may not only change the magnitude of the results, but also alter the direction of causality between the two variables (see also Caporale and Pittis, 1997; Caporale *et al*., 2004; Odhiambo, 2008). Secondly, some of the previous studies used cross-sectional data, which do not adequately address country-specific issues. As has been underlined in some of the previous studies, the traditional cross-sectional method, which simply groups together countries, cannot satisfactorily address the inherent country-specific effects that underlie the relationship between financial development and economic growth (see also Odhiambo, 2009; Odhiambo, 2008, Ghirmay, 2004; Quah, 1993; Casselli *et al*., 1996). Thirdly, some of the previous studies used only a monetization variable to measure the level of financial development; yet, it has been found that the relationship between

financial development and economic growth may be sensitive to the proxy used to measure the level of financial development.

In order to fill this lacuna, the current study aims to examine the causal relationship between financial development and economic growth in African countries from 1990 to 2014 using a dynamic panel Granger-causality model. The main advantage of using a panel data technique is that it addresses the weaknesses of both time-series and cross-sectional data techniques. In order to address the omission-of-variable bias associated with a bivariate causality model, the current study uses a trivariate Granger-causality model, which incorporates investment as a control variable between financial development and economic growth. Unlike some previous studies, the study uses three proxies of financial development: i) liquid liabilities (% of GDP); ii) money bank assets (% of GDP); and iii) bank deposits (% of GDP). The choice of these proxies was informed by the nature of financial development in many African countries. Indeed, the financial sectors in many developing countries are still at a developmental stage; hence, they are largely bank-based in nature. Very few countries have fully developed their market-based system. Finally, the study grouped the sample countries into English-speaking and French-speaking countries. To our knowledge, this may be the first study of its kind to independently examine the causal relationship between financial development and economic growth in English-speaking and French-speaking countries using a dynamic panel data analysis.

The rest of the paper is organised as follows: Section 2 gives an overview of some of the previous studies on the causal relationship between financial development and economic growth in both African and non-African countries; Section 3 deals with the empirical model specification, estimation techniques, and the discussion of the results; and Section 4 concludes the study.

2. EMPIRICAL LITERATURE REVIEW

Empirical evidence on the direction of causality between financial development and economic growth is varied. Although most studies support the supply-leading response, there is also evidence in support of the demand-following response, bidirectional response, and then causality view.

Odhiambo (2009a), Nwosa *et al.* (2011) and Osuala *et al*. (2013) examined the causality between financial development and economic growth in Anglophone African countries and found evidence in support of the supply-leading hypothesis. Studies conducted in other African countries by Ghali (1999), Adjasi and Biekpe (2006), Akinlo and Akinlo (2009), Akinlo and Egbetunde (2010) and Ahmed and Wahid (2011) found support for the same hypothesis. In non-African countries Arestis and Demetriades (1997), Ahmed and Ansari (1998),Rousseau and Wachtel (1998), Shan and Morris (2002), Choong *et al*. (2005), Majid (2008), Deb and Mukherjee (2008), Hussain and Chakraborty (2012), Bayar *et al*. (2014) and Gokmenoglu *et al*. (2015) found evidence of unidirectional causality flowing from financial development to economic growth. In the same vein, results of similar research carried out in other countries by Jung (1986), King and Levine (1993), Beck *et al*. (2000), Graff (2002),Jalilian and Kirkpatrick (2002), Chistopoulos and Tsionas (2004), Arestis *et al*. (2005), Kar *et al*. (2011), Omri *et al*. (2015) were consistent with the finance-led growth response.

Then, there is another scholarly group that argues the opposite – that economic growth leads to financial development. Thus, a number of studies on the finance-growth nexus support the demand-following hypothesis (see, among others, Odhiambo, 2004; 2008a; 2008b; 2009b; 2009c for the Anglophone countries). Although relevant studies covering Francophone countries were

not found, a number of studies from African and non-African countries are consistent with the demand-following hypothesis (see Agbetsiafa, 2003; Akinlo and Akinlo, 2009; Akinlo and Egbetunde, 2010; Shan *et al*., 2001; Shan and Morris, 2002; Zang and Kim, 2007; Ang and McKibbin, 2007; Guryay *et al*., 2007; Rachdi and Mbarek, 2011; Athanasios and Antonios, 2012; Ho and Odhiambo, 2013).

Despite the prodigious arguments in support of the supply-leading and demand-following hypotheses, there are a number of studies that provide evidence of bidirectional causality, where financial development and economic growth have been found to Granger-cause each other (see Akinboade, 1998 for Anglophone countries). Several other studies covering other African and non-African countries have concluded that financial development and economic growth are mutually causal. Such studies include Arestis and Demetriades (1997), Abu-Bader and Abu-Qarn (2008), Akinlo and Akinlo (2009), Akinlo and Egbetunde (2010),Jedidia *et al*. (2014), Wood (1993), Shan *et al.* (2001), Shan and Morris (2002), Fase and Abma (2003), Hondroyiannis *et al*. (2005), Shan and Jianhong (2006), Deb and Mukherjee (2008), Carp (2012), Cheng (2012), and Marques *et al*. (2013). Luintel and Khan (1999), Calderon and Liu (2003), and Masoud and Hardaker (2012) also found evidence consistent with the feedback hypothesis.

Lastly, there is the neutrality view, which is the fourth variant in the literature on the causal relationship between financial development and economic growth. According to this view, there exists no causal relationship between the two variables. For Anglophone countries, see Nyasha and Odhiambo (2015); for non-African countries, see Shan *et al.* (2001). A summary of studies on the causality between bank-based financial development and economic growth is presented in Table 1.

Table 1: A summary of studies on the causality between bank-based financial development and economic growth

Author(s)	Region/Country	Methodology	Direction of causality
Unidirectional causality from finance to growth			
Odhiambo (2009a)	Zambia	– Annual time-series data – Cointegration-based error-correction model – Trivariate causality model	Finance → Growth
Nwosa *et al*. (2011)	Nigeria	– Error correction model – Trivariate causality model	Finance → Growth
Osuala *et al*. (2013)	Nigeria	– Time-series – ARDL bounds testing approach	Finance → Growth (causality only from total number of deals ratio to economic growth)
Ghali (1999)	Tunisia	– Annual time-series	Finance → Growth
Adjasi and Biekpe (2006)	14 African countries	Dynamic panel data modelling	Finance → Growth (upper middle income economies)
Akinlo and Akinlo (2009)	Seven countries in sub-Saharan Africa	ARDL bounds test	Finance → Growth (in Egypt and South Africa)
Akinlo and Egbetunde (2010)	10 Sub-Saharan African countries	– Multivariate cointegration analysis and error-correction modelling	Growth → Finance (for Zambia)
Ahmed and Wahid (2011)	Seven African countries	– Panel cointegration analysis – Dynamic time series modelling	Finance → Growth
Arestis and Demetriades (1997)	South Korea, Germany, USA	– Johansen Cointegration Analysis	Finance → Growth (in Germany)
Ahmed and Ansari (1998)	South-Asia: India, Pakistan, and Sri Lanka	– Cross-sectionally heteroscedastic, time-wise autoregressive model	Financial → Growth
Rousseau and Wachtel (1998)	5 countries (United States, United Kingdom, Canada, Norway, and Sweden)	– Granger-causality in a VAR – Vector error-correction model	Finance → Growth
Shan and Morris (2002)	19 OECD countries and China	– Individual country time-series	Finance → Growth (for one country)
Choong *et al*. (2005)	Malaysia	– Time-series – Bounds test approach	Finance → Growth

Author(s)	Region/Country	Methodology	Direction of causality
		– Granger-causality test within vector error-correction model (VECM)	
Majid (2008)	Malaysia	– Quarterly time-series data – ARDL Approach – Vector error-correction model	Finance → Growth
Deb and Mukherjee (2008)	India	– Quarterly time-series – Granger non-causality test	Finance → Growth
Hussain and Chakraborty (2012)	An Indian State	– Time series techniques	Finance → Growth
Bayar *et al*. (2014)	Turkey	– Johansen-Juselius cointegration test	Finance → Growth
Gokmenoglu *et al*. (2015)	Pakistan	– Time series analysis – Granger causality test	Finance → Growth
Jung (1986)	56 Countries (19 of which are industrial)	– Cross-section	Finance → Growth (supply-leading pattern occurs more often than demand-following pattern in LDCs)
King and Levine (1993)	80 countries	– Cross-country analysis	Finance → Growth
Beck *et al*. (2000)	63 counties	– Cross-section and panel	Finance → Growth
Graff (2002)	93 countries	– Pooled cross-section	Finance → Growth (but unstable)
Jalilian and Kirkpatrick (2002)	42 countries (including 26 developing and 16 developed countries)	– Pooled panel data approach with both a time-series and cross-section dimension – Simple OLS, Panel and Two-Stage Least Squares	Finance → Growth
Chistopoulos and Tsionas (2004)	10 developing countries (Colombia, Paraguay, Peru, Mexico, Ecuador, Honduras, Kenya, Thailand, Dominican Republic and Jamaica)	– Panel unit root tests – Panel cointegration analysis – Dynamic panel data – estimation for a panel-based vector error-correction model – OLS	Finance → Growth
Beck and Levine (2004)	40 countries	– Panel data analysis – Generalised-Method-of Moments (GMM) estimators	Finance → Growth
Arestis *et al*. (2005)	Developing countries (Greece, India, South Korea, the Philippines, South Africa and Taiwan)	– Time-series data and methods – Dynamic heterogeneous panel approach	Finance → Growth
Kar *et al*. (2011)	Fifteen MENA countries	– Panel causality testing approach	Finance → Growth

Author(s)	Region/Country	Methodology	Direction of causality
Omri *et al*. (2015)	Twelve MENA countries	– Simultaneous-equation panel data modelling	Finance → Growth
Unidirectional causality from growth to finance			
Odhiambo (2004)	South Africa	– Johansen-Juselius cointegration technique and vector error-correction model	Growth →Finance
Odhiambo (2008a)	Kenya	– Cointegration and error-correction techniques – Trivariate causality model	Growth →Finance
Odhiambo (2008b)	Kenya	– Dynamic Granger-causality model	Growth → Finance
Odhiambo (2009b)	Kenya	– Annual time-series data – Cointegration and error-correction model within bivariate and trivariate causality systems	Growth → Finance
Odhiambo (2009c)	South Africa	– Annual time-series data – Trivariate causality model – Cointegration and error-correction models	Growth → Finance
Agbetsiafa (2003)	SSA	– Error-correction model	Growth → Finance
Akinlo and Akinlo (2009)	Seven countries in sub-Saharan Africa	ARDL bounds test	Growth → Finance (Evidence of growth-led finance in Nigeria)
Akinlo and Egbetunde (2010)	10 Sub-Saharan African countries	– Multivariate cointegration analysis and error-correction modelling	Growth → Finance (for Zambia)
Shan *et al*. (2001)	9 OECD countries and China	– Individual country time-series	Growth → Finance (for three countries)
Shan and Morris (2002)	19 OECD countries and China	– Individual country time-series	Growth → Finance (for 5 countries)
Ang and McKibbin (2007)	Malaysia	– Trivariate VAR models	Growth → Finance
Guryay *et al*. (2007)	Northern Cyprus	– Time series – Ordinary Least Squares techniques	Growth → Finance
Athanasios and Antonios (2012)	Greece	– Time-series – Vector Error-correction Model (VECM).	Growth → Finance
Ho and Odhiambo (2013)	Hong Kong	– Time-series	Growth → Finance
Rachdi and Mbarek (2011)	Ten countries	– Panel Data Cointegration and GMM System	Growth → Finance (for the MENA countries)

Author(s)	Region/Country	Methodology	Direction of causality
Bidirectional causality			
Akinboade (1998)	Botswana	– Annual time-series	Finance ↔ Growth
Arestis and Demetriades (1997)	South Korea, Germany, USA	Johansen cointegration analysis	Finance ↔ Growth (USA)
Abu-Bader and Abu-Qarn (2008)	Egypt	– Cointegration and vector error-correction methodology – Trivariate vector autoregressive framework	Finance ↔ Growth
Akinlo and Akinlo (2009)	Seven countries in sub-Saharan Africa	ARDL bounds test	Finance ↔ Growth (in Cote D'Ivoire, Kenya, Morocco and Zimbabwe)
Akinlo and Egbetunde (2010)	10 Sub-Saharan African countries	– Multivariate cointegration analysis and error-correction modelling	Finance ↔ Growth (for Chad, South Africa, Kenya, Sierra Leone and Swaziland)
Jedidia *et al*. (2014)	Tunisia	– ARDL bounds test	Finance ↔ Growth
Wood (1993)	Barbados	– Lag-length parameterisation of the individual time-series.	Finance ↔ Growth
Shan *et al.* (2001)	9 OECD countries and China	Individual time-series	Finance ↔ Growth for five countries
Shan and Morris (2002)	19 OECD countries and China	Individual country time-series	Finance ↔ Growth for 4 countries
Fase and Abma (2003)	8 Asian countries	– Individual country time-series	Finance ↔ Growth
Hondroyiannis *et al*. (2005)	Greece	Time-series	Finance ↔ Growth
Shan and Jianhong (2006)	China	– Annual time-series data – Vector Autoregression approach – Variance decomposition and impulse response function	Finance ↔ Growth
Deb and Mukherjee (2008)	India	– Quarterly time-series – Granger non-causality test	Finance ↔ Growth (between real market capitalisation ratio and economic growth)
Carp (2012)	Romania	Time-series	Finance ↔ Growth
Cheng (2012)	Taiwan	– Time-series – Vector autoregressive model	Finance ↔ Growth
Marques *et al*.	Portugal	Time-series	Finance ↔ Growth

Author(s)	Region/Country	Methodology	Direction of causality
(2013)			
Luintel and Khan (1999)	10 developing countries	– Multivariate time-series – VAR framework	Finance ↔ Growth
Calderon and Liu (2003)	109 developing and industrial countries	– Geweke decomposition test on pooled data	Finance ↔ Growth
Masoud and Hardaker (2012)	42 emerging market countries	Endogenous growth model.	Finance ↔ Growth
No causality			
Nyasha and Odhiambo (2015)	South Africa	– ARDL bound test approach	Finance ≠ Growth (between bank-based financial development and economic growth)
Shan *et al.* (2001)	9 OECD countries and China	Individual time-series	Finance ≠ Growth (for two countries)

3. ESTIMATION TECHNIQUES AND EMPIRICAL ANALYSIS

3.1 Data and Empirical Model Specifications

3.1.1 Data

The dependent variable used in this study is GDP growth rate (YGR). Three proxies of financial development utilised in this study, one at a time, are: Liquid liabilities to GDP ratio (FD1); deposit money bank assets to GDP ratio (FD2); and bank deposits to GDP ratio (FD3). Additionally, one intermittent variable – gross fixed capital formation (GFCF) – is used between economic growth and financial development to create a trivariate causality model.

The selected African countries are organised into two panels, A and B. Panel A consists of French-speaking African countries while Panel B is composed of English-speaking African countries. Each of the three models (Equations 1-3) is run for each panel (A and B). This study utilised panel data, covering the period from 1990 to 2014. All the data for this study

were sourced from World Bank Development Indicators (World Bank, 2017a) and Financial Development and Structure Dataset (World Bank, 2017b).

3.1.2 Trivariate Granger-Causality Model

To address the shortfalls of bivariate Granger-causality, this study utilises a trivariate Granger-causality model within a panel data framework. Panel data techniques are employed in this study to analyse the causal relationship between financial development and economic growth in selected African countries. The use of this technique is deemed most suitable because of the various advantages it renders. First, it has the ability to test more complicated behavioural models than a single cross sectional or time-series data set would allow. Second, it allows one to control for variables that cannot be observed or measured, or variables that change over time but not across entities, such as national policies, regulations, and international agreements, thereby allowing for individual heterogeneity. Third, it allows for a more accurate inference of model parameters since panel data usually contain more degrees of freedom and more sample variability than cross-sectional or time-series data (Hsiao *et al.*, 1995). Fourth, it generates more accurate predictions for individual outcomes by pooling the data rather than generating predictions of individual outcomes using the data on the individual in question (Hsiao *et al.*, 1993; 1989). The Granger-causality tests for Models 1, 2 and 3 can be expressed as follows:

Model 1:

$$\Delta \mathrm{YGR}_{\mathrm{it}} = \alpha_{0\mathrm{i}} + \sum_{\mathrm{p}} \alpha_{1\mathrm{ip}} \Delta \mathrm{YGR}_{\mathrm{it-p}} + \sum_{p} \alpha_{2ip} \Delta FD1_{it-p} + \sum_{p} \alpha_{3ip} \Delta GFCF_{it-p} + \alpha_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..1$$

$$\Delta \mathrm{FD1}_{\mathrm{it}} = \beta_{0\mathrm{i}} + \sum_{\mathrm{p}} \beta_{1\mathrm{ip}} \Delta \mathrm{FD1}_{\mathrm{it-p}} + \sum_{p} \beta_{2ip} \Delta YGR_{it-p} + \sum_{p} \beta_{3ip} \Delta GFCF_{it-p} + \beta_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 2$$

$$\Delta \mathrm{GFCF}_{\mathrm{it}} = \delta_{0\mathrm{i}} + \sum_{\mathrm{p}} \delta_{1\mathrm{ip}} \Delta \mathrm{GFCF}_{\mathrm{it-p}} + \sum_{p} \delta_{2ip} \Delta YGR_{it-p} + \sum_{p} \delta_{3ip} \Delta FD1_{it-p} + \delta_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 3$$

Model 2:

$$\Delta \mathrm{YGR}_{\mathrm{it}} = \alpha_{0\mathrm{i}} + \sum_{\mathrm{p}} \alpha_{1\mathrm{ip}} \Delta \mathrm{YGR}_{\mathrm{it-p}} + \sum_{p} \alpha_{2ip} \Delta FD2_{it-p} + \sum_{p} \alpha_{3ip} \Delta GFCF_{it-p} + \alpha_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 4$$

$$\Delta \mathrm{FD2}_{\mathrm{it}} = \beta_{0\mathrm{i}} + \sum_{\mathrm{p}} \beta_{1\mathrm{ip}} \Delta \mathrm{FD2}_{\mathrm{it-p}} + \sum_{p} \beta_{2ip} \Delta YGR_{it-p} + \sum_{p} \beta_{3ip} \Delta GFCF_{it-p} + \beta_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 5$$

$$\Delta \mathrm{GFCF}_{\mathrm{it}} = \delta_{0\mathrm{i}} + \sum_{\mathrm{p}} \delta_{1\mathrm{ip}} \Delta \mathrm{GFCF}_{\mathrm{it-p}} + \sum_{p} \delta_{2ip} \Delta YGR_{it-p} + \sum_{p} \delta_{3ip} \Delta FD2_{it-p} + \delta_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 6$$

Model 3:

$$\Delta \mathrm{YGR}_{\mathrm{it}} = \alpha_{0\mathrm{i}} + \sum_{\mathrm{p}} \alpha_{1\mathrm{ip}} \Delta \mathrm{YGR}_{\mathrm{it-p}} + \sum_{p} \alpha_{2ip} \Delta FD3_{it-p} + \sum_{p} \alpha_{3ip} \Delta GFCF_{it-p} + \alpha_{4i} ECT_{t-1} + \varepsilon_{it} \ldots\ldots 7$$

$$\Delta \mathrm{FD3_{it}} = \beta_{0i} + \sum_{p} \beta_{1ip} \Delta \mathrm{FD3_{it-p}} + \sum_{p} \beta_{2ip} \Delta YGR_{it-p} + \sum_{p} \beta_{3ip} \Delta GFCF_{it-p} + \beta_{4i} ECT_{t-1} + \varepsilon_{it} \quad \ldots\ldots 8$$

$$\Delta \mathrm{GFCF_{it}} = \delta_{0i} + \sum_{p} \delta_{1ip} \Delta \mathrm{GFCF_{it-p}} + \sum_{p} \delta_{2ip} \Delta YGR_{it-p} + \sum_{p} \delta_{3ip} \Delta FD3_{it-p} + \delta_{4i} ECT_{t-1} + \varepsilon_{it} \quad \ldots\ldots 9$$

where:

FD1	First proxy of financial development, proxied by liquid liabilities to GDP (%)
FD2	Second proxy of financial development, proxied by deposit money bank assets to GDP (%)
FD3	Third proxy of financial development, proxied by bank deposits to GDP (%)
YGR	Economic growth, proxied by GDP growth (annual %)
GFCF	Investment, proxied by gross fixed capital formation (% of GDP)
Δ	First difference operator
ECT	Error-correction term
ε	White noise error term
i	Individual country
t	Time period
p	Lag length

3.2 Empirical Analysis and Discussion

3.2.1 The Panel Unit Root Test

In order to identify the order of integration of the variables used in the study, three panel unit root tests are employed: i) Levin-Lin-Chu (LLC) (2002); ii) Im, Pasaran and Shin (IPS) (2003); and iii) the Augmented Dickey-Fuller (ADF) unit root tests. The results are reported in Table 2 for both country groupings – 16 French-speaking African countries and 12 English-speaking African countries.

Table 2: The results of panel unit root tests

	LLC *t*-Statistics		IPS *W*-Statistics		*ADF - Fisher Chi-square*	
	Level	**First Difference**	**Level**	**First Difference**	**Level**	**First Difference**
French-Speaking African Countries						
FD1	2.27016	-6.19123***	2.52862	-6.2409***	22.6366	100.183***
FD2	0.09951	-4.04262***	-0.00217	-3.75338***	48.7377**	66.6868***
FD3	4.71505	-5.82357***	5.54618	-4.54959***	9.71317	77.6094***
GFCF	1.06559	-7.84338***	-0.13648	-8.75352***	31.2167	135.383***
YGR	-4.62***	-6.15334***	-6.06407***	-15.7457***	95.3279***	252.518***
English-Speaking African Countries						
FD1	-1.8079**	-5.85024***	-0.7872	-6.15241***	27.17	82.5998***
FD2	-2.1144**	-6.01379***	0.11709	-6.16217***	30.3551	85.6126***
FD3	-1.6536**	-6.09483***	0.41082	-5.8745***	18.2048	79.3059***
GFCF	-0.40303	-9.97350***	-0.50262	-10.0352***	25.0604	136.558***
YGR	-6.443***	-12.2536***	-6.4426***	-14.6264***	87.7275***	136.558***

*Note: *, ** and*** indicate rejection of the respective null hypothesis at the 10%, 5% and 1% significance levels, respectively.*

The results of panel unit root tests reported in Table 2 show that the data is conclusively and consistently stationary in first difference.

3.2.2 The Panel Cointegration Test

Given the nature of the data used in this study, the unbalanced panel data analysis was employed. For the analysis of a long-run relationship among variables in this study, two panel cointegration tests are employed to ensure the veracity of the findings. These are: (i) the Pedroni (2004) residual cointegration test; and (ii) the Kao (1999) residual cointegration test. The cointegration results are reported in Table 3.

Table 3: Panel cointegration results

	Panel A : French-speaking countries						Panel B : English-speaking countries					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	Statistic	**Probability**	**Statistic**	**Probability**	**Statistic**	**Probability**	**Statistic**	**Probability**	**Statistic**	**Probability**	**Statistic**	**Probability**
PANEL 1: Pedroni Residual Cointegration Test												
Pedroni panel cointegration test – within-dimension												
Panel v-Statistic	0.161099	0.4360	0.641100	0.2607	0.125918	0.4499	-2.375261	0.9912	-1.697851	0.9552	-2.689157	0.9964
Panel rho-Statistic	-5.095585	0.0000	-5.634313	0.0000	-5.234914	0.0000	-5.055616	0.0000	-5.281191	0.0000	-5.122991	0.0000
Panel PP-Statistic	-13.18666	0.0000	-14.90870	0.0000	-14.14191	0.0000	-12.46468	0.0000	-13.12684	0.0000	-13.05823	0.0000
Panel ADF-Statistic	-12.89729	0.0000	-14.91994	0.0000	-13.62259	0.0000	-12.72710	0.0000	-13.38754	0.0000	-13.20083	0.0000
Pedroni panel cointegration test – between-dimension												
Group rho-Statistic	-3.675971	0.0001	-3.908196	0.0000	-3.565528	0.0002	-2.347321	0.0095	-2.488631	0.0064	-2.510448	0.0060
Group PP-Statistic	-18.07530	0.0000	-19.76674	0.0000	-21.00310	0.0000	-14.17722	0.0000	-12.94651	0.0000	-14.10805	0.0000
Group ADF-Statistic	-14.18417	0.0000	-15.64846	0.0000	-14.74892	0.0000	-11.13453	0.0000	-11.66405	0.0000	-11.29755	0.0000
PANEL 2: Kao Residual Cointegration Test												
	t-Statistic	**Probability**	**t-Statistic**	**Probability**	**t-Statistic**	**Probability**	**t-Statistic**	**Probability**	**t-Statistic**	**Probability**	**t-Statistic**	**Probability**
ADF	-10.38541	0.0000	-11.10768	0.0000	-11.06569	0.0000	-11.21431	0.0000	-9.222109	0.0000	-10.95290	0.0000

Overall, the results of the two panel cointegration tests reported in Table 3.3 reveal that the variables in all three models (1 – 3) in both the French-speaking and English-speaking countries (i.e. Panel A and Panel B) are cointegrated; hence, the Granger-causality test could be performed.

3.2.3 Trivariate Granger-Causality Results

The Granger-causality test was performed to examine the causal relationship between YGR and the different proxies for financial development. The test is conducted after a VECM estimation with the assumption of one cointegration between variables. This allows testing for Granger-causality in both the short and the long run. The short-run causality is given by the Chi-squared statistic, while the long-run causality relies on the significance of the error-correction term (ECT). Table 4 presents the Granger-causality results for all models (Models 1 – 3) for both French-speaking and English-speaking African country groups.

Table 4: Granger-causality results for all models

Panel A: French-Speaking African Countries		**Independent Variable**											
	Dependent Variable	**Model 1 – FD1**				**Model 2 – FD2**				**Model 3 – FD3**			
		D(YGR)	**D(FD1)**	**D(GFCF)**	**ECT**	**D(YGR)**	**D(FD2)**	**D(GFCF)**	**ECT**	**D(YGR)**	**D(FD3)**	**D(GFCF)**	**ECT**
	D(YGR)	—	0.1182 (0.9983)	1.4874 (0.8289)	-0.8155*** (-7.2757)	—	11.8961** (0.0181)	2.7082 (0.6078)	-0.7835*** (-7.0415)	—	2.8361 (0.5856)	1.7242 (0.7863)	-0.7997*** (-7.1465)
	D(FD1/2/3)	8.9602* (0.0621)	—	29.4725*** (0.0000)	0.1387** (2.3191)	0.4653 (0.9768)	—	25.6808*** (0.0000)	0.0765 (1.3235)	10.4689** (0.0332)	—	44.4041*** (0.0000)	0.1016** (2.2194)
	D(GFCF)	6.8956 (0.1415)	3.7667 (0.4385)	—	0.2697** (2.5074)	7.0173 (0.1350)	13.8894*** (0.0077)	—	0.2852*** (2.6593)	7.5363 (0.1101)	4.3040 (0.3664)	—	0.2946*** (2.7387)
Panel B: English-Speaking	**Dependent Variable**	**Independent Variable**											
		D(YGR)	**D(FD1)**	**D(GFCF)**	**ECT**	**D(YGR)**	**D(FD2)**	**D(GFCF)**	**ECT**	**D(YGR)**	**D(FD3)**	**D(GFCF)**	**ECT**
	D(YGR)	—	0.9950 (0.6081)	5.8696* (0.0531)	-0.7582*** (-8.4903)	—	4.4974 (0.1055)	6.3502** (0.0418)	-0.7400*** (-8.3063)	—	1.2482 (0.5357)	5.4292* (0.0662)	-0.7606*** (-8.4292)
	D(FD1/2/3)	7.1335** (0.0282)	—	1.4826 (0.4765)	0.1320 (1.63042)	1.3319 (0.5138)	—	3.4029 (0.1824)	0.1757** (2.1963)	5.6415* (0.0596)	—	2.0671 (0.3557)	0.1277* (1.80497)
	D(GFCF)	1.5108 (0.4698)	0.2360 (0.8887)	—	0.156472 (1.61405)	2.0953 (0.3508)	5.5972* (0.0609)	—	0.1507 (1.5598)	1.7127 (0.4247)	0.8103 (0.6669)	—	0.1626* (1.6589)

Note: Null hypothesis of 'No granger causality' between the dependent and independent variable. Chi-squared statistics and p-values in parentheses for short-run. ECT coefficients and t-stats in parentheses for long-run relation. *; **; *** denote significance at 10%, 5% and 1% respectively. In brackets are standard errors.

The results reported in Table 4, Panel A, reveal that in the French-speaking African countries, there is unidirectional Granger-causality from economic growth to financial development, but only in the short run when financial development is proxied by FD1 and FD3. However, when FD2 is used to measure financial development, there is short- and long-run unidirectional Granger-causality from financial development to economic growth.

The results reported in Table 4, Panel B, show that in the English-speaking African countries, there is a distinct unidirectional causal flow from economic development to financial development, only in the short run when FD1 and FD3 are used to proxy financial development (Panel B, Models 1 and 3). However, the study failed to get a causal relationship between economic growth and financial development when FD2 is used as a proxy. Although contrary to expectations, these results are not unusual (see, among others, Shan *et al.,* 2001; Nyasha and Odhiambo, 2015).

Other results show that in French-speaking African countries, there is: (i) unidirectional causality from investment (GFCF) to FD1, FD2 and FD3 only in the short run; (ii) bidirectional causality between investment and FD2 in the short run. The other results of this study further reveal that in the English-speaking African countries, there is: (i) unidirectional causality from investment to economic growth in the short and long run, in all the three models; and (ii) unidirectional causality from FD2 to investment in the short run.

4. CONCLUSION

This chapter has examined the causal relationship between financial development and economic growth in African countries using panel data for the period from 1990 to 2014. The study divided African countries into two groups, namely French-speaking and English-speaking countries. The study was motivated by the conflicting findings that have been reported by previous studies and by the methodological weaknesses of some of the previous studies. In order to address the weaknesses of some of the previous studies, the study used a trivariate panel Granger-causality model, which incorporates investment as an intermittent variable between financial development and economic growth. The study also used three proxies to measure the level of financial development in both French-speaking and English-speaking countries. These include, i) liquid liabilities (FD1); ii) deposit money bank assets (FD2); and iii) bank deposits (FD3). These proxies are in tandem with the financial systems currently prevailing in many African countries, which are largely bank-based in nature. The results of the panel Granger-causality show that the causality between financial development and economic growth differs significantly between French-speaking countries and English-speaking countries. The results also depend on the proxy used to measure the level of financial development and the time-frame. When FD1 and FD3 were used as proxies for financial development, a demand-following response was found to predominate in both French- and English-speaking countries. However, when FD2 was used as a proxy, the study found a distinct unidirectional causal flow from financial development to economic growth (supply-leading) to prevail in French-speaking African countries, but failed to find any causal

relationship between financial development and economic growth in English-speaking countries in either direction.

REFERENCES

Abu-Bader, S. and Abu-Qarn, AS. 2008. Financial development and economic growth: The Egyptian experience. *Journal of Policy Modelling*, 30, 887-898.

Adjasi, CKD. and Biekpe, NB. 2006. Stock market development and economic growth: The case of selected African countries. *African Development Review,* 18(1), 144-161.

Agbetsiafa, D. 2004. The finance growth nexus: evidence from sub-Saharan Africa. *Savings and Development*, 28 (3), 271-288.

Ahmed, A.D. and Wahid, ANM. 2011. Financial Structure and Economic Growth Link in African Countries: A Panel Cointegration Analysis. *Journal of Economic Studies*, 38(3), 331-357.

Ahmed, SM. and Ansari, MI. 1998. Financial sector development and economic growth: The South-Asian experience. *Journal of Asian Economics*, 9(3), 503-517.

Akinboade, OA. 1998. Financial development and economic growth in Botswana, a test for causality. *Savings and Development*, 3(22), 331-348.

Akinlo, AE. and Akinlo, OO. 2009. Stock market development and economic growth: Evidence from seven sub-Sahara African countries. *Journal of Economics and Business*, 61(2), 162-171.

Akinlo, AE. and Egbetunde, T. 2010. Financial development and economic growth: The experience of 10 sub-Saharan African countries revisited. *The Review of Finance and Banking*, 2(1), 17-28.

Anagnostou, A., Kallioras, D. and Petrakos, G. 2016). Integrating the Neighbours: A Dynamic Panel Analysis of the EU-ENP Countries' Trade Relations. *Comparative Economic Studies*, 58(1), 17-42.

Ang, JB. and McKibbin, WJ. 2007. Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, 84(1), 215-233.

Arestis, P. and Demetriades, P. 1997. Financial development and economic growth: Assessing the evidence. *The Economic Journal*, 107, 783-799.

Arestis, P., Luintel, AD. and Luintel, KB. 2005. Financial structure and economic growth. *CEPP working paper No. 06/05.* University of Cambridge, Centre for Economic and Public Policy.

Athanasios, V. and Antonios, A. 2012. Stock market development and economic growth: An empirical analysis. *American Journal of Economics and Business Administration*, 4(2), 135-143.

Bayar, Y., Kaya, A. and Yildirim, M. 2014. Effects of stock market development on economic growth: Evidence from Turkey. *International Journal of Financial Research*, 5(1), 93-100.

Beck, T., Levine, R., and Loayza, N. 2000. Finance and the sources of growth. *Journal of Financial Economics*, *58*, 261-300.

Calderon, C. and Liu, L. 2003. The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321-334.

Carp, L. 2012. Can stock market development boost economic growth? Empirical evidence from emerging markets in Central and Eastern Europe. *Procedia Economics and Finance*, 3, 438-444.

Chaiboonsri, C., Sriboonchitta, S. and Calkins, P. 2010. A Panel Cointegration Analysis: An Application to International Tourism Demand of Thailand. *The Thailand Econometric Society*, 2(2), 85-100.

Cheng, S. 2012. Substitution or complementary effects between banking and stock markets: Evidence from financial openness in Taiwan. *Journal of International Financial Markets, Institutions & Money*, 22, 508-520.

Christopoulos, DK. and Tsionas, EG. 2004. Financial development and economic growth: Evidence from panel root and cointegration tests. *Journal of Development Economics*, 73, 55-74.

Das A., Chowdhury.M. and Akhtaruzzam, M. 2012. Panel cointegration and pooled mean group estimations of energy-output dynamics in South Asia. *Journal of Economics and Behavioural Studies,* (4)5, 277-286.

Deb, SG. and Mukherjee, J. 2008. Does stock market development cause economic growth? A time-series analysis for the Indian economy. *International Research Journal of Finance and Economics*, 21, 142-149.

Fase, MMG. and Abma, RCN. 2003. Financial environment and economic growth in selected Asian countries. *Journal of Asian Economics,* 14(1), 11-21.

Ghali, KH. 1999. Financial development and economic growth: The Tunisian experience. *Review of Development Economics*, 3(3), 310-322.

Gokmenoglu, KK., Amin, MY. and Taspinar, N. 2015. The Relationship Among International Trade, Financial Development and Economic Growth: The Case of Pakistan. *Procedia Economics and Finance*, 25, 489-496.

Graff, M. 2002. Causal links between financial activity and economic growth: Empirical evidence from a cross-country analysis, 1970-1990. *Bulletin of Economic Research,* 54(2), 119-133.

Guryay, E., Safakli, OV. and Tuzel, B. 2007. Financial development and economic growth: Evidence from Northern Cyprus. *International Research Journal of Finance and Economics*, 8, 57-62.

Ho, SY. And Odhiambo, NM. 2013. Banking Sector Development and Economic Growth in Hong Kong: An Empirical Investigation. *International Business & Economics Research Journal*, 12(5), 519-532.

Holtz-Eakin, D., Newey, W. and Rosen, H. 1988. Estimating vector autoregressions with panel data. *Econometrica*, 56(6), 1371-1395.

Hondroyiannis, G., Lolos, S. and Papapetrou, E. 2005. Financial markets and economic growth in Greece, 1986–1999. *Journal of International Financial Markets, Institutions and Money,* 15(2), 173-188.

Hsiao, C., Luke, CMW., Mountain, DC. and Tsui, KY. 1989. Modeling Ontario regional electricity system demand using a mixed fixed and random coefficients approach. *Regional Science and Urban Economics,* 19(4), 567-587.

Hsiao, C., Mountain, DC. and Ho-Illman, K. 1995. Bayesian integration of end-use metering and conditional demand analysis. *Journal of Business and Economic Statistics*, 13, 315-326.

Hsiao. C., Appelbe, TW. and Dineen, CR. 1993. A general framework for panel data analysis – n with an application to Canadian customer dialed long distance service. *Journal of Economics*, 59(1-2), 63-86.

Hussain, F. and Chakraborty, DK. 2012. Causality Between Financial Development and Economic Growth: Evidence from an Indian State. *The Romanian Economic Journal*, 15(45), 27-48.

IM, KS., Pesaran, MH., Shin, Y., 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74.

Jalilian, H. and Kirkpatrick, C. 2002. Financial development and poverty reduction in developing countries. *International Journal of Finance and Economics*, 7(2), 97-108.

Jedidia, KB., Boujelbène, T. and Helali, K. 2014. Financial development and economic growth: New evidence from Tunisia. *Journal of Policy Modeling*, 36(5), 883-898.

Jung, WS. 1986. Financial development and economic growth: International evidence. *Economic Development and Cultural Change*, 34, 333-346.

Kar, M., Nazlioqlu, S. and Aqir, H. 2011. Financial Development and Economic Growth Nexus in the MENA Countries: Bootstrap Panel Granger-Causality Analysis. *Economic Modelling*, 28, 685-693.

King, RG. and Levine, R. 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108 (3), 713-737.

Levin, A. and Lin, CF., 2002. Unit root test in panel data: asymptotic and fine-sample properties. *Journal of Econometrics*, 108(1), 1-24.

Luintel, KB. and Khan, M. 1999. A quantitative reassessment of the finance growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, 60(2), 381- 405.

Maddala GS and Shaowen, W. 1999. A comparative study of unit root tests with panel data and new simple test", *Oxford Bulletin of Economics and Statistics, Special issue*, 631-652.

Majid, MSA. 2008. Does financial development matter for economic growth in Malaysia? An ARDL bound testing approach. *Journal of Economic Cooperation*, 29(1), 61-82.

Marques, LM., Fuinhas, JA. and Marques, AC. 2013. Does the stock market cause economic growth? Portuguese evidence of economic regime change. *Economic Modelling*, 32, 316-324.

Masoud, N. and Hardaker, G. 2012. The impact of financial development on economic growth: Empirical analysis of emerging market countries. *Studies in Economics and Finance*, 29(3), 148-173.

Narayan, PK., Nielsen, I. and Smyth, R. 2008. Panel data, cointegration, causality and Wagner's law: Empirical evidence from Chinese provinces. *China Economic Review*. 19, 297-307.

Nwosa, PI., Agbeluyi, AM. and Saibu, OM. 2011. Causal Relationships Between Financial Development, Foreign Direct Investment and Economic Growth. The Case of Nigeria. *International Journal of Business Administration*, 2(4), 93-97.

Nyasha, S. and Odhiambo, NM. 2015. Banks, stock market development and economic growth in South Africa: a multivariate causal linkage. *Applied Economics Letters*, 22(18), 1480-1485.

Odhiambo, NM. 2004. Is financial development still a spur to economic growth? A causal evidence from South Africa. *Savings and Development*, 28(1), 47-62.

Odhiambo, NM. 2008a. Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25, 704-713.

Odhiambo, NM. 2008b.Financial development in Kenya: A dynamic test of the finance-led growth hypothesis. *Economic Issues,* 13 (2), 21-36.

Odhiambo, NM. 2009a. Interest Rate Liberalization and Economic Growth in Zambia: A Dynamic Linkage. *African Development Review*, 21(3), 541-557.

Odhiambo, NM. 2009b. Finance-growth nexus and inflation dynamics in Kenya: An empirical investigation. *Savings and Development*, 33(1), 7-25.

Odhiambo, NM. 2009c. Finance-growth-poverty nexus in South Africa: A dynamic causality linkage. *Journal of Socio-Economics*, 38, 320-325.

Omri, A., Daly, S., Rault, C. and Chaibi, A. 2015. Financial Development, Environmental Quality, Trade and Economic Growth: What Causes What in MENA Countries? *Energy Economics*, 48, 242-252.

Örsal, DDK., 2007. Comparison of Panel Cointegration Tests. SFB 649 Discussion Paper 2007-029. Humboldt-UniversitÄatzu Berlin, School of Business and Economics Spanduerstr.1, 10099 Berlin, Germany. [Online] Available from <http://sfb649.wiwi.hu-berlin.de ISSN 1860-5664> [Accessed 04 January 2018].

Osuala, AE., Okereke, JE. and Nwansi, GU. 2013. Does stock market development promote economic growth in emerging markets? A causality evidence from Nigeria. *World Review of Business Research*, 3(4), 1-13.

Pedroni, P., 2004. Panel cointegration; asymptotic and finite sample properties of polled time series tests, with an application to the PPP hypothesis: New results. *Econometric Theory*, 20(3), 597-625.

Pedroni, P., Vogelsang, T.2005. Robust unit root and cointegartion rank test for panels and large systems. Mimeo, Williams College.

Rachdi, H., Mbarek, HB. 2011. The Causality between Financial Development and Economic Growth: Panel Data Cointegration and GMM System Approaches, International Journal of Economics and Finance, 3(1): 143-151.

Rousseau, L. and Wachtel, P. 1998. Financial intermediation and economic performance: Historical evidence from five industrialised countries. *Journal of Money, Credit and Banking,* 30, 657-78.

Shan, J. and Jianhong, Q. 2006. Does financial development 'lead' economic growth? The case of China. *Annals of Economics and Finance,* 1, 231-250.

Shan, JZ. and Morris, AG. 2002. Does financial development 'Lead' economic growth. *International Review of Applied Economics*, 16(2), 153-168.

Shan, JZ., Morris, AG. and, Sun, F. 2001. Financial development and economic growth: An egg and chicken problem? *Review of International Economics*, 9(3) 443-454.

Wood, A. 1993. Financial development and economic growth in Barbados: Causal evidence. *Savings and Development*, 17 (4), 379-390.

World Bank. 2017a. World Development Indicators. [Online] Available from < http://databank.worldbank.org/data/ > [Accessed 04 July 2017].

World Bank. 2017b. Financial Development and Structure Dataset. [Online] Available from <http://www.worldbank.org/en/publication/gfdr/data/financial-structure-database> [Accessed 04 July 2017].