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## The Finance Growth Link: Comparative Analysis Of Two Eastern African Countries

### Abstract

*This paper examines the finance growth link of two low-income Sub-Saharan African economies – Ethiopia and Kenya – which have different financial systems but are located in the same region. Unlike previous studies, we account for the role of non-bank financial intermediaries and formally model the effect of structural breaks caused by policy and market-induced economic events. We used the Vector Autoregressive model (VAR), conducted impulse response analysis and examined variance decomposition. We find that neither the level of financial intermediary development nor the level of stock market development explains economic growth in Kenya. For Ethiopia, which has no stock market, intermediary development is found to be driven by economic growth. Three important inferences can be made from these findings. First, the often reported positive link between finance and growth might be caused by the aggregation of countries at different stages of economic growth and financial development. Second, country-specific economic situations and episodes are important in studying the relationship between financial development and economic growth. Third, there is the possibility that the econometric model employed to test the finance growth link plays a role in the empirical result, as we note that prior studies did not introduce control variables.*

**Keywords:** *finance, growth, Ethiopia, Kenya, stock markets, private credit*

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## 1. Introduction

Theory predicts that finance promotes economic growth by ameliorating the information asymmetry problem (Blackburn et al., 2005, pp. 135–149), increasing investment efficiency (Greenwood and Jovanovic 1990, pp. 1076–1107), providing liquidity (Bencivenga and Smith 1991, pp. 95–209), and allowing people to choose among different skill levels by enabling them to finance the cost of education (De Gregorio and Kim 2000, pp. 579–607). The empirical test of the finance-growth link has produced a large body of literature, with mixed results. Early empirical studies by King and Levine (1993, pp. 717–737) and Atje and Jovanovic (1993, pp. 632–640), and later by Levine and Zervos (1998, pp. 537–558), Rajan and Zingales (1998, pp. 559–586) and Beck and Levine (2004, pp. 423–442), and more recently by Dawson (2008, pp. 325–331), Bittencourt (2012, pp. 341–355), and Herwartz and Walle (2014, pp. 417–427) reported that financial development promotes economic growth. On the other hand, Naceur and Ghazouani (2007, pp. 297–315) and Ram (1999, pp. 164–174) found no such relationship. Some find bi-directional relationships between the two (Thangavelu et al. 2004, pp. 247–260) while others find that growth drives financial development (Chakraborty, 2008, pp. 109–139).

Despite a large body of theoretical postulates and empirical findings, the debate is far from being conclusive. The major theoretical debate is over the direction of causality and on the channels through which finance can promote economic growth. Similarly, empirical studies could not produce conclusive evidence on the direction of causality and on the strength of the relationship. This is attributed to, among others, the inability to find appropriate measures of financial development, the unavailability of data, the lumping together countries at different levels of economic growth, and using the wrong econometric specifications.

Although to our knowledge no previous studies have been done on the finance-growth link in Ethiopia, they have been done for Kenya. Using time series data, Odhiambo (2008, pp. 320–325) found unidirectional causality of finance and growth in Kenya, with economic growth driving financial development. In contrast, Wolde-Rufael (2009, pp. 1140–1146) found a bi-directional causality of finance and growth in Kenya. However, the monetary aggregates (i.e. M2 and M3) utilized in both papers are considered weak proxies for financial development (see Levine and Zervos, 1998, pp. 537–557). Besides, neither author controlled human capital development, inflation, government size and trade openness. Furthermore, both authors did not account for structural breaks, and this casts doubt on the validity of the conclusions drawn because, as shown by Perron and Qu (2010, pp. 275–290), failure to account for structural breaks leads to spurious conclusions. Therefore, we examined the finance growth link in Ethiopia and

Kenya, both at a similar stage of economic growth, by considering private credit by non-bank financial institutions along with bank credit, and controlled for human capital development, inflation, government size, trade openness and structural breaks.

The remainder of this paper is organised as follows: Section 2 presents a review of related theoretical and empirical literature; Section 3 discusses the level of financial development and economic growth in Ethiopia and Kenya; Section 4 discusses the research methodology; Section 5 presents empirical findings; and the last section offers conclusions.

## **2. Review of related literature**

Financial markets and institutions channel savings of surplus units to deficit units, and help foster investment activities. However, whether this function of financial markets and institutions can boost economic growth has remained a contentious empirical issue. The relationship between financial development and economic growth was first postulated by Schumpeter (1934), who argued that the financial system can be used to channel resources into their most productive use, hinting that financial development can lead to economic growth. In contrast, nearly two decades later Robinson (1952) argued that financial development does not lead to economic growth, but rather follows it. This sparked interest among scholars and led to the emergence of a large body of theoretical and empirical studies.

The theoretical model underpinning the link between finance and growth is based on the ability of financial markets and institutions to: (1) ameliorate the problem of information asymmetry (Diamond, 1984, pp. 393–414; Bose and Cothren, 1996, pp. 363–376; Blackburn and Hung, 1998, pp. 101–124; Morales, 2003, pp. 363–393; Blackburn et al., 2005, pp. 135–149); (2) increase the efficiency of investments (Greenwood and Jovanovic, 1990, pp. 1076–1107); (3) enhance investment productivity (Saint-Paul, 1992, pp. 763–781); (4) provide liquidity, thereby allowing capital accumulation (Bencivenga and Smith, 1991, pp. 195–209); and (5) facilitate human capital formation (De Gregorio and Kim, 2000, pp. 579–607). Diamond (1984, pp. 393–414) emphasizes the ability of financial intermediaries to monitor investment projects at a lower cost, which eventually increases entrepreneurs' access to funds. In the absence of intermediaries, the monitoring costs would be too large and hence would discourage credit to entrepreneurs. As demonstrated by Bose and Cothren (1996, pp. 363–376), this particular attribute of intermediaries promotes the allocation of resources, thereby leading to economic growth.

Various other theoretical models were developed with emphasis on a particular channel through which finance affects growth. For instance, Blackburn and Hung (1998, pp. 107–124) show that intermediaries contribute to economic growth by managing the moral hazard problem via designing incentive-compatible loan contracts to avoid diversion of funds towards other purposes. Bencivenga and Smith (1991, pp. 195–209) emphasize the ability of intermediaries in attracting deposits from a large number of depositors, from which they create loans that can be used to finance long-term investment projects. This promotes capital formation, thereby leading to economic growth. Saint-Paul (1992, pp. 763–781) explains the benefits of financial markets in promoting technology specialization. He shows that entrepreneurs can engage in a specialized technology that poses more risk since they can diversify the risk with the help of financial markets. De Gregorio and Kim (2000, pp. 579–607) focus on intermediaries' ability to permit individuals to specialize in skills useful in industrial development.

However, researchers disagree on the direction of causality between finance and growth. While most theories predict uni-directional causality, whereby finance leads to economic growth, some (de la Fuente and Marín, 1996, pp. 269–301; Saint-Paul, 1992, pp. 763–781; Greenwood and Jovanovic, 1990, pp. 1076–1107; Khan, 2001, pp. 413–433) show that finance and growth have a bi-directional causal relationship. Saint-Paul (1992, pp. 763–781) shows that when innovation increases, so does the demand for financial services, which in turn leads to growth in the intermediary sector. Similarly, Khan (2001, pp. 413–433) posits that growth enhances financial development by raising the net worth of borrowers' collateral, and finance promotes growth by increasing return on investment. In sum, although different theoretical models have been developed to explain the link between finance and growth, disagreements prevail on the direction of causality.

Empirical testing of the finance-growth theory was pioneered by Goldsmith (1969) who concluded, with caveats, that financial development is positively linked to economic growth. The empirical inquiry into the finance-growth nexus was reignited later by King and Levine (1993a, pp. 717–737), who found a strong correlation between financial development indicators and economic growth parameters. In another paper, King and Levine (1993b, pp. 513–542) reveal the channels through which finance can boost economic growth, and re-confirmed this through empirical evidence.

However, concern emerged among scholars that the econometric model used by King and Levine (1993a, pp. 717–737) might have been affected by the estimation bias caused by simultaneity, omitted variables, and country-specific fixed effects. To mitigate the simultaneity bias, Atje and Jovanovic (1993, pp. 632–640) introduced initial-level financial development indicators, and found that stock market development, rather than banking sector development, has a significant

effect on economic growth. In contrast, Levine and Zervos (1998, pp. 537–558) found that both stock market and banking sector development are important in explaining economic growth. While these empirical studies focused on the effect of financial development on economic growth at the macro level, Rajan and Zingales (1998, pp. 559–586) attempted to test the finance-growth link using firm-level data and observed that finance boosts growth through its effect on industrial activities.

In later studies it was noted that the finance-growth link is affected by the income group of sample economies and by the measures of financial development employed. The fact that the finance growth link differs across different income groups is evident from Calderón and Liu (2003, pp. 321–334), who found a positive effect of finance on growth for the whole sample of 109 countries, but a bi-directional causality when the sample is split between developed and developing countries. Similarly Blanco (2009, pp. 224–248), by splitting the sample into countries of different income groups, finds bi-directional causality for the middle-income countries, contradicting a study on countries in the same region by Bittencourt (2012, pp. 341–355), who found a significant positive relationship between finance and growth. Durham (2002, pp. 211–232) finds a positive relationship between stock market development and growth only for high-income countries. More recently, Herwartz and Walle (2014, pp. 417–427) found that the finance-growth link is stronger in high-income economies than in low-income ones. They also observe that the finance-growth link turns negative for low-income economies when they have a large government sector or if they are open to international trade. Furthermore, Rioja and Valev (2004, pp. 429–447) found that the finance-growth link is uncertain for low-income regions, strongly positive in intermediate regions, and small in high-income regions.

Benhabib and Spiegel (2000, pp. 341–360) moved a step forward by testing the effect of financial development on total productivity growth and investment activities, using the generalised method of moments (GMM). They found that financial development promotes growth by enhancing total productivity and investment activities. However, it emerged in later studies that the finance-growth link differs across income groups and depends on the specific financial development indicator used. More recently, Arcand et al. (2012) reported that finance promotes growth only where credit to the private sector is less than 100%, beyond which finance curtails growth. The fact that the finance growth link changes based on the financial development indicators used is evident from Dawson (2008, pp. 325–331), who found a strong positive relationship between finance and growth when financial development is measured using growth in M3. Surprisingly, he found a negative relationship between finance and growth when financial development is measured using the ratio of M3 to GDP. Similarly, Adu et al. (2013, pp. 192–203) found that the relationship between

finance and growth is positive only when they used private credit to GDP and private credit to total credit. The relationship turned negative when they used broad money (M3) as a proxy.

In general, despite the existence of a large body of theoretical and empirical literature, the theoretical predictions as well as empirical evidence are far from conclusive. Kirkpatrick (2005, p. 632) rightly puts it that “our understanding of the fundamental relationship between financial development and economic growth therefore remains incomplete.” Firstly, there is discordance between theory and empirics. As noted by Trew (2006, pp. 481–490), while theoretical modelling focuses on the efficiency of the financial system, empirical investigations emphasize financial depth. Consequently, theory and empirics follow a parallel thread with a broken feedback loop. Furthermore, cross-country studies are believed to be plagued by an omitted variables bias, the simultaneity problem, and a country-specific bias (Rajan and Zingales 1998, pp. 559–586, Wachtel 2003, pp. 33–48). For this reason Manning (2003, pp. 1–22 ) suggests that studies should focus on countries in similar stages of economic and financial development. In addition, Driffill (2003, pp. 363–380) and Ram (1999, pp. 164–174) suggest that studies should focus on the finance-growth link in individual economies over a long-period.

Against this background this study examines the finance growth link through a comparative study of two low-income economies<sup>1</sup> in Sub-Saharan Africa with quite different economic policies and performance. While Ethiopia pursues state capitalism, where public sector investment is the major driver of economic growth, Kenya follows a private sector-led economy where the role of the state is confined to facilitation of private sector activities. In terms of financial development, Kenya has a more developed financial sector compared to Ethiopia, which still has a nascent intermediary sector.

### **3. Financial development and Economic Growth in Ethiopia and Kenya**

The Ethiopian financial system is underdeveloped, and its population’s access to bank services is the lowest even by the SSA standard. A recent report by the World Economic Forum (2014) ranks the country’s financial sector 120<sup>th</sup> out of 144 economies. In contrast, Kenya has the most developed financial sector in East Africa (Beck et al., 2010), and this is evident from the fact that the country’s financial sector is ranked 24<sup>th</sup> in the world. In terms of size, the assets of the Ethiopian financial sector constituted only 28.7% of GDP in 2011, compared to

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<sup>1</sup> It is noted that Kenya re-based its GDP in 2014 and moved into the lower middle-income category.

57.2% in Kenya, implying that the latter country's financial sector is twice as large as that of Ethiopia.

As shown in Table 1, there are notable differences in the structure of the financial sector in the two economies. In Ethiopia, more than 90% of assets are owned by the five largest banks, while in Kenya only 60% of assets are owned by the five largest banks. The extent of concentration in Ethiopia is magnified when we use a more stringent measure, namely, assets of the three largest banks. While 83% of banking sector assets are controlled by only three banks in Ethiopia, a comparable figure for Kenya is 39.9%. This higher concentration in the banking sector in Ethiopia is explained by the fact that the Commercial Bank of Ethiopia, the largest state-owned bank, controls 42% of bank branches, 52% of outstanding loans, and 39% of banking capital (NBE, 2013). The other area of distinction in the two nations' banking sectors is the fact that while foreign banks constitute 35% of banks operating in Kenya, no foreign bank operates in Ethiopia. The higher degree of concentration in the Ethiopian banking sector explains the lower degree of competition, as shown by its higher Lerner index of 0.56 compared to 0.28 for Kenya.

Underdevelopment of the banking sector in Ethiopia is also evident from the limited level of access compared to Kenya. For instance, as shown in Table 1, the ATM penetration in Ethiopia, at 0.33 per 100,000 adults, is very low compared to Kenya where it is almost 30 times as large. Bank accounts per 1,000 adults in Ethiopia are only 114.8 and are more than five times larger in Kenya. There are only two bank branches per 100,000 adults in Ethiopia, while there are 5.2 in Kenya. Likewise, with its private credit to GDP ratio of 17.2%, financial depth is lower in Ethiopia when compared to the 33.6% in Kenya.

The two nations also differ in terms of the stability of their banking sectors. The Kenyan banking sector experienced two crisis episodes, the first in 1985/86 and the second from 1992 to 1995, while no crisis was experienced in the Ethiopian banking sector. Both nations now have a stable banking sector, as shown by their Unlike Ethiopia, Kenya has a stock market, which is the second largest in Africa in terms of market capitalization, and fifth largest in terms of market liquidity (World Bank, 2013). The country also has a bond market, in which mostly governmental bonds are traded.

According to the World Economic Forum (2014), both nations are classified as factor-driven economies. However, the economic history, economic policy and recent economic trends of the two vary. Ethiopia adopted a market economy in 1991, shifting from the command economy that was in place over the preceding 17 years when the country followed a socialist ideology. The government undertook a massive privatization project, but kept 100% stakes in the telecommunications, energy, and airline sectors. The government defied the proposals of the World Bank

and IMF to privatise the Commercial Bank of Ethiopia – the biggest commercial bank in the country. In Ethiopia, private sector activities are generally confined to areas that are considered by the government as not strategically important. Consequently, the role of the private sector on the country's economy is marginal. In contrast, Kenya has been following a private sector-led economy since its independence in 1963, and the government has gradually relinquished its ownership interest in state-owned enterprises. Like Ethiopia, Kenya is a factor-driven economy, but it fares better than its peers.

**Table 1. Financial development indicators for Ethiopia and Kenya (2011)**

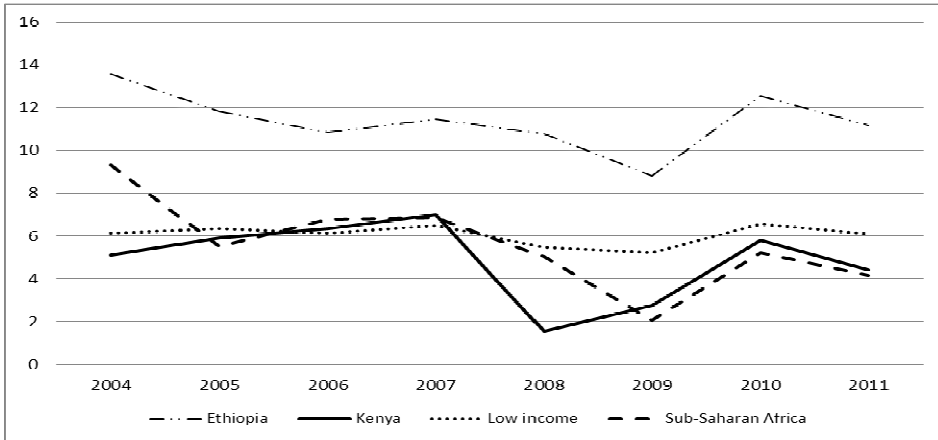
Size	Ethiopia	Kenya
Financial sector assets to GDP(%)	28.7	57.2
<b>Structure</b>		
5-bank asset concentration (%)	92.6	59.3
Bank concentration (assets of 3 largest banks) (%)	83.3	39.9
Foreign banks among total banks (%)	0	35
<b>Competition</b>		
Lerner index	0.56	0.28
<b>Access</b>		
ATMs per 100,000 adults	0.33	9.46
Bank accounts per 1,000 adults	114.8	651.5
Bank branches per 100,000 adults	2	5.2
<b>Stability</b>		
Bank Z-score	9.2	14.1
Number of banking crisis episodes	0	2
<b>Depth</b>		
Private credit by deposit money banks and other financial institutions to GDP (%)	17.2	33.6
<b>Capital market</b>		
Stock market capitalization to GDP (%)	0	35.4
Stock market total value traded to GDP (%)	0	2.8
Stock market turnover ratio (%)	0	7.4

Source: The World Bank (2013).

As depicted in Figure 1, the Kenyan GDP growth rate is below Sub-Saharan Africa and the low-income economies' average over the last eight years. In contrast, Ethiopia has managed to maintain a double digit GDP growth rate over the same period, becoming one of the fastest growing economies in Africa.



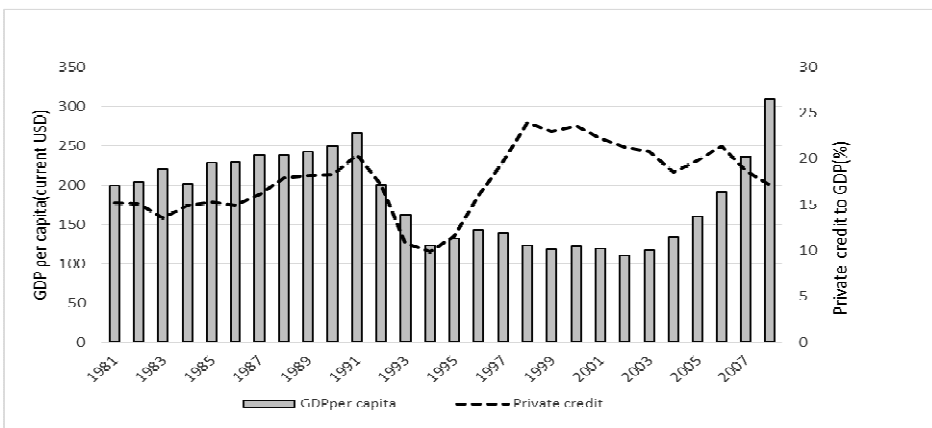
**Figure 1. GDP growth rate (%) of Ethiopia and Kenya compared to Sub Saharan Africa and low income economies**



Source: own computation based on data from World Development Indicators.

As depicted in Figure 2, private credit and GDP per capita in Ethiopia were trending together from 1981 to 1996, and began to diverge from 1997 onwards. GDP per capita has been falling from 1997 to 2002, while private credit had shown a significant upward trend until 1998, stabilized in 2000, and then started a downward trend until 2004. It then increased until 2006 and began falling thereafter. This induces the interesting question of whether or not financial development played a role in the country’s economic growth.

**Figure 2. Private credit and GDP per capita in Ethiopia (1981–2008)**

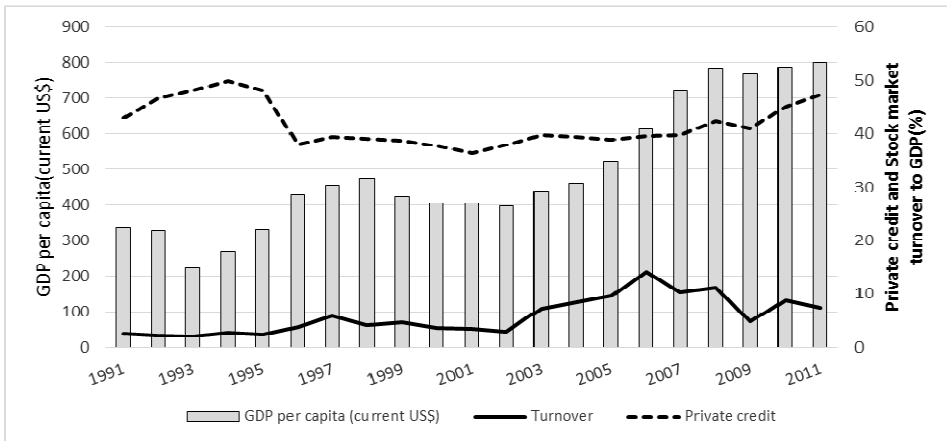


Source: own computation based on data from World Development Indicators.

For Kenya, as depicted in Figure 3 below, the relationship between per capita GDP and private credit is visibly weak. While GDP per capita exhibited a significant increase over the period 1991 to 2011, the change in private credit over the same period is marginal at best. The stock market turnover ratio appears to be weakly linked to GDP per capita.

However, as earlier noted previous studies on the issue, which used weak proxies of financial development, reported a reverse causality between finance and growth, suggesting that the level of financial development achieved by a country is driven by economic growth rather than vice versa (Odhiambo 2008, pp. 704–713).

**Figure 3. Private credit, Stock market turnover and GDP per capita in Kenya(1991–2011)**



**Source:** own computation based on data from World Development Indicators.

## 4. Methodology

### 4.1. Data

The data on financial development indicators were obtained from the Global Financial Development database of the World Bank (*updated on November 2013*), and the data on economic growth and control variables were obtained from World Development Indicators database of the World Bank. Instead of confining our analysis to bank development, we also considered the development of non-bank financial institutions (measured using private credit by deposit money banks and other financial institutions). We added development of non-bank financial

institutions following (Liang and Reichert, 2012, pp. 699–717) who noted that disregarding the role of such institutions would lead to biased conclusions about the finance-growth link. Although stock market development can be gauged using three measures, i.e., market capitalization, value traded, and turnover ratio, we used the turnover ratio due to limitations in the other two (see Beck and Levine 2004, pp. 423–442). Due to differences in the financial sector structure of the two economies, we used private credit and the stock market turnover ratio for Kenya while we used only private credit for Ethiopia. Moreover, because structural breaks and banking crises affect the finance-growth link, and the failure to account for them may lead to model mis-specification, as noted by Perron and Qu (2010, pp. 275–290) and Watchtel (2011, pp. 33–48) respectively, we introduced a dummy variable to account for structural breaks and the presence of banking crises in each country. As reported by Allaro et al. (2011, pp. 392–400), 2003 marked the year wherein a shift in the Ethiopian economic policy started to take effect. For Kenya, a dummy variable is introduced to account for the structural breaks (1992–1995, 1999, 2003, 2005, 2006, 2008) reported by Ndirangu et al. (2014) and banking crisis (1992–1995) reported by the World Bank (2013).

## 4.2. Estimation Model

We used the vector autoregressive (VAR) model popularized by Sim (1980, pp. 1–48). The VAR model is preferred because it offers a very rich structure, which allowed us to capture more features of the data and, as argued by Sim (1980, pp. 1–48), performs better than structural models. Besides, the VAR model accounts for innovation through the impulse response function and variance decomposition. The impulse response function helps in determining how each variable responds over time to an earlier ‘shock’ in that variable and to ‘shocks’ in other variables. Variance decomposition, on the other hand, permits inferences to be drawn regarding the proportion of the movement in a particular variable due to its own earlier ‘shocks’ and ‘shocks’ arising from other variables in the VAR.

Following the standard procedure in time series econometrics, we conducted a test of stationarity using the Augmented Dicky Fuller test. As shown in Table 2, all series are non-stationary at level, but become stationary at first difference. Therefore, we conducted the Johansen co-integration test to see if there are any co-integrating vectors. There are two co-integrating vectors for the Kenyan equation and one co-integrating vector for the Ethiopian equation, calling for the Vector Error Correction model (VECM). However, Naka and Tufte (2006, pp. 1593–1603) showed that unrestricted VECM estimates performance poorly relative to unrestricted VAR. They also showed that impulse response functions of the two

models are similar at short horizons, suggesting that the loss of efficiency from VAR estimation is not critical at the commonly used short horizon. VECM is more robust only over long time horizons (Hoffman and Rasche, 1996, pp. 495–517). Therefore, we used a differenced VAR model with the following specification:

$$\Delta X_t = \sum_{i=1}^k \Gamma_i \cdot \Delta X_{t-i} + C \cdot \Delta D_t + \varepsilon_t \quad (1)$$

where  $\Delta X_t$  is the vector of the endogenous variables at first difference<sup>2</sup> (DGDP, DBOND, DPRCR, DTO), and  $D_t$  is the vector of exogenous variables at first difference<sup>3</sup> (DENROL, DGSIZE, DINF, DOPEN and DUM),  $\Gamma_i$  is the coefficient matrix of endogenous variables,  $C$  is the coefficient matrix of exogenous variables, and  $k$  is the optimal lag number. The residuals are denoted by  $\varepsilon_t$ .

**Table 2. Augmented Dicky Fuller test of stationarity**

Variable	Kenya		Ethiopia	
	Level	1st difference	Level	1st difference
<i>GDP per capita</i>	4.0400	-3.9156***	0.4601	-2.314**
<i>Private credit</i>	0.3938	-4.2269***	0.2138	-3.7758***
<i>Stock Market</i>	0.0721	-6.0192***		
<i>School enrolment</i>	0.7616	-7.5673***	2.1109	3.2497**
<i>Trade openness</i>	0.4944	-4.5807***	0.8223	-5.5578***
<i>Inflation</i>	-1.5262	-4.7851***	-1.9878**	-6.6965***
<i>Government size</i>	-0.2342	-3.5953***	-0.1508	-3.4846***

\*\*\*p<0.01 \*\*p<0.05 \*p<0.1

Source: Augmented Dicky fuller test output of Eviews 8.

<sup>2</sup> DGDP, DBOND, DPRCR, DTO refers to first difference of GDP per capita growth, private credit by bank and nonbank financial institutions to GDP, and Stock market turnover to GDP respectively.

<sup>3</sup> DENROL, DGSIZE, DINF, DOPEN and DUM refers to first difference of Secondary school enrolment, government size, inflation, trade openness respectively and dummy variable for structural break and banking crisis respectively.

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## 5. Empirical results

### 5.1. Vector autoregression results

The VAR model is sensitive to lag length, and hence determining the optimal lag order is the most important step in estimating the VAR. The optimal lag order is found to be two for both equations, using Akaike information criteria, Schwartz information criteria and Hannan-Quinn information criterion. Table 3 below shows the estimation output for the VAR, one model for each endogenous variable. We conducted the model specification test and confirmed that our VAR satisfies the stability condition because all the modulus are less than unity and no root lies outside the unit circle. The VAR result shows that private credit has no effect on GDP per capita growth in Kenya. Similarly, stock market turnover does not affect economic growth in that country. The result also shows that GDP per capita affects neither private credit nor stock market turnover. In general, the VAR results suggest that financial development does not affect economic growth and vice versa. This is consistent with Demetriades and James (2011, pp. 263–265), who reported that there is no link between finance and growth in sub-Saharan Africa (SSA). The fact that stock markets do not affect growth was already predicted by Singh (1997), who argued that stock markets increase output volatility and this offsets their purported benefit of enhancing capital allocation. More importantly, in countries like Kenya, where corruption is considered the second most important factor impeding doing business (see World Economic Forum, 2014), credit allocation might have been made based on connections and graft rather than the commercial viability of projects. This is further strengthened by the fact that non-performing loans were once a serious problem in the Kenyan banking industry.

For Ethiopia, private credit is significantly affected by GDP per capita growth, while private credit does not have a statistically significant effect on GDP per capita growth. This result, which suggests that economic growth drives financial development in Ethiopia, can perhaps be explained based on the fact that the country's financial system is dominated by state-owned institutions and that such institutions extend credit to the private sector pursuing the state's policy. In general, considering the fact that financial deepening in Sub-Saharan Africa is low, it is not surprising that finance has no effect on economic growth.

**Table 3. VAR outputs ( t-statistics in parenthesis )**

Independent Variables	Equations in the VAR system				
	Kenya			Ethiopia	
	DGDPP. C	D_PRCR	D_TO	DGDPP. C	D_PRCR
<i>DGDPP. C(-1)</i>	0.115001 ( 0.35965)	0.148123 ( 0.92738)	-0.118834 (-0.14092)	0.302004 ( 1.17745)	<b>0.781247***</b> ( <b>3.66474</b> )
<i>DGDPP. C(-2)</i>	-0.035464 (-0.09496)	0.27731 ( 1.48660)	-0.449442 (-0.45636)	-0.035595 (-0.12759)	<b>-0.59401**</b> ( <b>-2.56179</b> )
<i>D_PRCR(-1)</i>	-0.178891 (-0.22532)	-0.311409 (-0.78524)	-2.916413 (-1.39292)	0.275417 ( 1.59114)	0.574805 ( 3.99542)
<i>D_PRCR(-2)</i>	0.168351 ( 0.16255)	-0.702772 (-1.35844)	0.780214 ( 0.28566)	-0.29468 (-1.38437)	-0.513255 (-2.90108)
<i>D_TO(-1)</i>	0.055748 ( 0.44796)	-0.073819 (-1.18750)	-0.239329 (-0.72923)		
<i>D_TO(-2)</i>	0.000218 ( 0.00164)	-0.099931 (-1.50612)	0.075296 ( 0.21495)		
<i>D_ENROL</i>	0.059595 ( 0.35938)	0.051636 ( 0.62338)	0.106917 ( 0.24449)	0.026761 ( 0.10505)	0.07206 ( 0.34034)
<i>D_SIZE</i>	0.664746 ( 0.64463)	-0.300597 (-0.58357)	2.813139 ( 1.03444)	0.146699 ( 0.80967)	<b>0.407541**</b> ( <b>2.70631</b> )
<i>D_INF</i>	-0.000111 (-0.05545)	-0.001655 (-1.65902)	<b>0.010322*</b> ( <b>1.96029</b> )	0.001091 ( 1.32192)	<b>0.002138***</b> ( <b>3.11527</b> )
<i>D_OPENNES</i>	-0.86595 (-1.51806)	<b>0.601796**</b> ( <b>2.11204</b> )	-1.132757 (-0.75300)	-0.081792 (-0.52241)	-0.003488 (-0.02681)
Dummy	0.053861 ( 1.19770)	-0.00871 (-0.38774)	0.10339 ( 0.87180)	<b>0.070333***</b> ( <b>2.47063</b> )	-0.046566 (-1.96808)
<i>Constant</i>	0.001597 ( 0.05423)	-0.00638 (-0.43374)	0.008888 ( 0.11444)	-0.012211 (-0.83912)	0.008722 ( 0.72117)
<i>R<sup>2</sup></i>	0.626845	0.496773	0.661573	0.660927	0.80401
<i>F-statistic</i>	1.068998	0.628201	1.243994	3.248689	6.837178

\*\*\*, \*\*, \* significant at 1%, 5% and 10% respectively

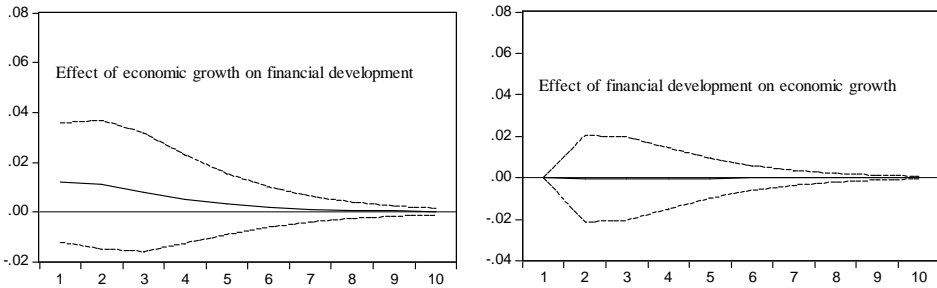
Source: VAR estimates using Eviews 8.

## 5.2. Impulse response analysis

Analysis of the impulse response function shows that economic growth does not respond to shocks in financial development in Ethiopia, while financial development responds to shocks in economic growth. This confirms the results of the VAR estimation reported above. For Kenya, both private credit and stock market turnover positively respond to shocks in GDP per capita growth, but the responses

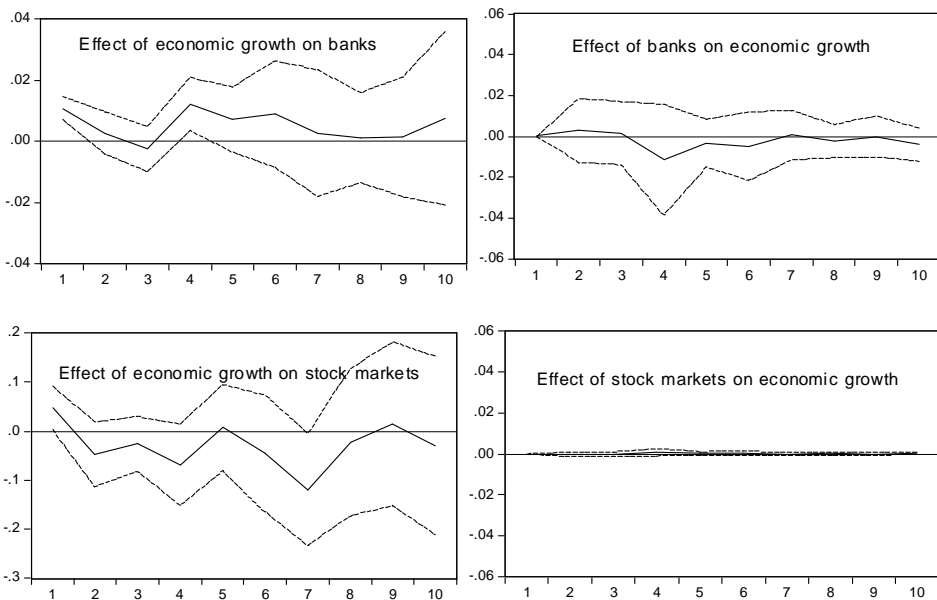
are not statistically significant. GDP per capita, however, does not respond to shocks in either private credit or stock market turnover. This confirms our earlier report, based on VAR results, that there is no statistically significant link between finance and growth in Kenya.

**Figure 4. Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.(Ethiopia)**



Source: Output of impulse the response function using Eview 8.

**Figure 5. Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.(Kenya)**



Source: Output of impulse response function using Eview 8.

### 5.3. Variance decomposition

The decomposition of variance in GDP per capital growth due to shocks in private credit and stock market turnover provides further insights into the relationship between financial development and economic growth in the two economies. In Kenya, the response of GDP per capita to shocks in private credit is less than 1% until the third year, and it reaches a maximum of 9% over the remaining period suggesting that private credit does not have a statistically significant effect on economic growth. The response of GDP per capita to shocks in stock market turnover is lower than 0.5%, suggesting the insignificance of stock market development in promoting economic growth in the country. It has been noted that GDP per capita responds more to shocks in private credit than shocks to stock market return. This can be partly explained based on the fact that the Kenyan stock market is smaller in size than its financial institutions. For instance, the average value of private credit by bank and nonbank financial institutions to GDP ratio over the study period is 28%, compared to a stock market turnover ratio of 6%. In general, variance decomposition suggests that the development of financial institutions and markets have no significant effect on economic growth. This is consistent with results of the VAR and impulse response analysis reported in previous sections. In Ethiopia, the response of GDP per capita to shocks in private credit is less than 3% over the first three years, about 7% in the 4<sup>th</sup> year, and increases to about 10% afterwards. This suggests that a significant portion of variance in GDP per capita is driven by factors other than changes in private credit, implying that development of bank and nonbank financial institutions has no perceptible role in economic development in Ethiopia. In general, our variance decomposition result confirmed the VAR results and impulse response analysis.

**Table 4. Variance decomposition**

Year	<i>Percentage of variation in GDP per capita growth due to shocks in</i>		
	<b>Private credit (Kenya)</b>	<b>Stock (Kenya)</b>	<b>Private credit (Ethiopia)</b>
1	0.000000	0.000000	0.000000
2	0.590672	0.003949	1.208132
3	0.734737	0.006544	2.70318
4	8.815159	0.042036	7.181984
5	9.231289	0.043368	11.19788
6	8.050032	0.037315	11.66954
7	7.352532	0.034805	11.11905
8	7.310602	0.034653	10.58566
9	7.221364	0.034232	10.28629
10	7.760102	0.036994	10.76429

Source: Variance decomposition report obtained from Eviews 8.



## 6. Conclusions

Research on the finance growth link is inconclusive at best. Existing studies are criticized for their failure to account for the simultaneity and endogeneity problems. Concerns are also raised about the validity of conclusions drawn from studies that lumped together countries at different stages of economic and financial development. Moreover, ignoring country-specific events is considered to have caused some invalid conclusions. This paper therefore set out to examine the finance-growth link using two Sub-Saharan African economies at a comparable stage of economic growth, but with different levels of financial development.

Unlike previous studies, this study considered private credit provided by non-bank financial institutions as well. Moreover, attempts were made to see the effect of banking crises and structural breaks on the finance-growth link. It was found that neither banks nor stock markets are important in explaining economic growth in Kenya. This is consistent with Demetriades and James (2011), who found no link between finance and growth in Sub-Saharan Africa. In Ethiopia, intermediary development is driven by economic growth.

Three important inferences can be made from the results of this study. First, the oft-reported positive link between finance and growth might be caused by the aggregation of countries of different economic growth and financial development. Second, country-specific economic situations and episodes are important in studying the relationship between financial development and economic growth. Third, there is a possibility that the econometric model employed to test the finance-growth link plays a role in the empirical result, as we note that prior studies did not introduce control variables.

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## Streszczenie

### **SYSTEM FINANSOWY A WZROST GOSPODARCZY: ANALIZA PORÓWNAWCZA DWÓCH PAŃSTW AFRYKI WSCHODNIEJ**

*W artykule poddano analizie zależność wzrostu gospodarczego od rozwoju systemu finansowego w dwóch gospodarkach regionu Afryki Subsaharyjskiej o niskich dochodach – Etiopii i Kenii – które mają różne systemy finansowe, ale znajdują się w tym samym regionie. Inaczej niż w poprzednich badaniach, wykazujemy tutaj rolę niebankowych finansowych instytucji pośredniczących i formalnie modelujemy efekty zmian strukturalnych spowodowanych przez polityki oraz zdarzenia gospodarcze wywołane przez rynek. Wykorzystano model wektorowej autoregresji (VAR), przeprowadzono analizę odpowiedzi impulsowych i zbadano dekompozycję wariancji. Stwierdzono, że ani poziom rozwoju pośrednictwa finansowego ani poziom rozwoju rynku akcji nie stanowi wyjaśnienia zjawiska wzrostu gospodarczego w Kenii. W Etiopii, która nie dysponuje rynkiem giełdowym, rozwój instytucji pośredniczących jest napędzany przez wzrost gospodarczy. Z tych ustaleń mogą być wyciągnięte trzy ważne wnioski. Po pierwsze, często obserwowany pozytywny związek między rozwojem systemu finansowego a wzrostem gospodarczym może być spowodowany przez agregację krajów będących na różnych etapach rozwoju gospodarczego i finansowego. Po drugie, sytuacja i zdarzenia gospodarcze w poszczególnych krajach mają znaczenie dla badania relacji między rozwojem finansowym a wzrostem gospodarczym. Po trzecie, istnieje możliwość, że model ekonometryczny zastosowany do testowania powiązań między wzrostem a finansami będzie przydatny, ponieważ, jak zwrócono uwagę, we wcześniejszych badaniach nie uwzględniano zmiennych kontrolnych.*

**Słowa kluczowe:** *finanse, wzrost, Etiopia, Kenia, rynki giełdowe, kredyty sektora prywatnego*