
Exploring entrepreneurship and financial institutions on economic development in Africa: A Panel Corrected Standard Error approach

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ABSTRACT

African nations are confronted with complex barriers to sustainable economic and social development. These are exploding population growth, and alarming youth unemployment. The effect is that Africa has become the epic center of poverty and squalor couple with an uninspiring economic development level. Therefore, this study is set out to investigate the important role of entrepreneurship and economic development as a fulcrum through the mechanism of financial institution as being projected in recent time. These prominent variables are acknowledged to play a crucial role in any economy. It becomes imperative to unravel the potency of financial institution in the African continent in contending with role of entrepreneurship to enhance growth. The econometric strategy employed data for 10 African countries in the period of 2006-2016, and estimated by the Panel Corrected Standard Error approach. The results showed that the role of entrepreneurship is significant to improve economic development. Such improvement is encouraged by the positive impact of financial institution and trade on economic development. But increase in labour force participation significantly reduce economic development. It is suggested that finance be made accessible to entrepreneur to encourage the trading of their product within and outside the region. Entrepreneur would have opportunity to embark and executed their business ideas. By so doing, positive development would occur within and among economies in the region.

Keywords: Entrepreneurship, Economic Development, Financial Institution

1. INTRODUCTION

The growing interest in the role of entrepreneurship in economic development in Africa, is critical due to its significant impact on sustainable growth and job creation (Conti, *et al.*, 2023). The continent faces severe challenges, such as high unemployment rates, which require urgent attention. A shift in mindset, inspired by the concept of "creative destruction" proposed by economist Schumpeter, is suggested as a potential solution (Schumpeter, 1960, Gonzalez-Uribe & Leatherbee, 2018). Entrepreneurship is increasingly seen as a solution to Africa's job crisis, with a strong entrepreneurial spirit among its youth (Madalu, 2023). However, challenges persist, including limited access to appropriate funding, high operational costs, poor macroeconomic conditions, and unsupported government policies (Conti, *et al.*, 2023, and SMEDAN AND NBS 2022, 2021).

Financial institutions play a crucial role in promoting economic growth, by providing capital to businesses and individuals. They assist companies in investing in new technologies, expanding operations, and creating employment (Al-Azri, and Al-Habsi, 2019). In addition to this, they assist individuals in investing in their education, purchasing residences, and saving for retirement. These activities all contribute to economic expansion and growth (Al-Azri, and Al-Habsi, 2019). Institutions that provide secure property rights, a fair and balanced judicial system, contract enforcement, make finance available (Cole *et al.*, 2016; Cumming & Zhang, 2016; Samila & Sorenson, 2011), boost entrepreneurial capital (Stenholm *et al.*, 2013), effective limits on government's ability to transfer wealth through taxation and regulation" (Sobel, 2008) will see a difference in the quality of entrepreneurial activity.

The relationship between entrepreneurship, financial institutions, and economic development is complex and influenced by various factors, including institutions' quality, financial development, entrepreneurial capital, regulatory framework, corruption, and government size and programs (Chowdhury *et al.*, 2019). Similarly, Zakarakis (2006) posited that entrepreneurship activities accounted for the changes in the growth rate of GDP in a study that involved sixteen developed economies. Meanwhile, there is a linkage between entrepreneurship, economic growth and finance and vice versa. By improving financial institutions and supporting high-impact entrepreneurship, African economies can overcome challenges and foster sustainable development (Chowdhury *et al.* (2019). This necessitates the need for a greater understanding of the match between the type and quality of entrepreneurial activity.

Hence, this study attempt to investigate the impact of entrepreneurship and financial institutions on economic development in Africa using panel corrected standard error and thereby extend the literature given the prominence of the issue at hand confronting policy makers, scholars and commentators as it remains an endearing discuss most especially in Africa.

2. LITERATURE REVIEW

Conceptual Review

Entrepreneurship

Entrepreneurship has been defined in various ways by scholars. Bilic et al. (2011) and Kauffman (2008) viewed entrepreneurship as a transformative process that can originate from innovative ideas leading to enterprise formation or from an existing enterprise creating new value. Casson (2003) succinctly described entrepreneurship as an "act of embarking on judgmental actions about the harmonization of rare resources" (p. 20). Entrepreneurship encompasses the creation or extraction of economic value through the establishment of businesses, with entrepreneurs taking on risks and reaping rewards. It involves designing, launching, and managing new ventures, often focusing on innovation and the ability to turn ideas into products or services (Economic Impact Catalyst, 2024 and OECD, 2023).

More so, entrepreneurship is recognized for its ability to create new jobs (Folster, 2000; Adusei, 2016), enhance economic welfare, efficiency, and productivity (Baumol et al., 1990), and serve as a major driver of innovation (Baumol, 2014). Cantner, Dinopoulos, and Lanzillotti (2010) emphasized that the recent wave of technological innovation and inventions has prompted a surge in innovative financing through venture capital and angel investors. This has enabled the commercialization of innovative ideas by facilitating risk-sharing and support (Morales, 2003). Furthermore, Carlsson (2009) noted that countries that are able to leverage technology are more disposed to fostering innovation.

These studies confirmed that, access to finance is a critical factor for entrepreneurship, particularly in developing countries. Kerr, Lerner, and Schoar (2010) provided evidence that the sources of funding can impact a business's ability to survive and grow. For instance, angel investors have been an important source of funding for startups, with around 60% of startups being linked to angel investors (Shane, 2009). However, this may not be the case in developing countries in Africa .

Economic Development

Economic development is the process by which the economic well-being and quality of life of a nation, region, local community, or an individual are improved according to targeted goals and objectives (CALED, 2024). It involves creating wealth from which community benefits are realized, going beyond just being a jobs program to being an investment in the community. Economic development is a deliberate intervention in economic growth to make it easier or more attractive, influencing private sector investment towards opportunities that lead to sustained economic growth. It is distinct from community development, focusing purely on the creation of wealth for community benefits (CALED, 2024).

Economic development is a key concept that is used in measuring the performance of an economy. Pietak (2014) described economic development as a process of describing the dynamics of economic processes in a country. It refers to the increase in the market value of the goods and services produced by an economy over time. Similarly, Cvetanovic, et al., (2019) described economic growth as the “increase in the value of a country's production over time”. According to them, the extent of growth that a country can achieve depends on its ability and capacity to accumulate the direct factors of production and invest in knowledge acquisition. Economic development can be measured in nominal or real terms. It can also be measured as the percentage of increase in real gross domestic product (GDP).

Financial Institutions

Basically, financial institutions are companies that offer both corporations and people financial services. These organizations consist of banks, credit unions, investment firms, insurance providers, and other organizations of the same nature (Demirguc-Kunt & Klapper, 2018). Because they make it possible for people to save, invest, and borrow money, financial institutions play a crucial role in the economy. These organizations further assist companies in managing risks, gaining access to money, and growing their operations.

When the anticipated assistance and funding are delivered, financial institutions play a crucial part in fostering entrepreneurship (Demirguc-Kunt & Klapper, 2018). One of the most crucial elements in beginning and expanding a business is capital. Entrepreneurs cannot bring their ideas to market without enough funding. Financial institutions offer capital in several ways, including loans, credit lines, and equity financing. Entrepreneurs may launch or grow their enterprises, as well as invest in cutting-edge research and development, as a result of these financial resources (Al-Mahrizi, and AlHabsi, 2018).

Evidence abounds in the literature on the positive impact of a well-developed financial sector on economic growth. However, the controversy stemming from the weaknesses associated with measurement of financial development also serves as a motivation to further explore more studies in the domain as more is needed to be known, particularly in developing economies.

Theoretical Framework

Panel Corrected Standard Error (PCSE)

Panel Corrected Standard Error (PCSE) is a method for estimating standard errors in panel data models, where the data is grouped into panels, and the observations within each panel are correlated. The PCSE method takes into account the within-panel correlation, which leads to more accurate standard error estimates compared to the traditional OLS method (Bailey and Katz., 2022). The PCSE method was first proposed by Beck and Katz (1995) and is implemented in the R package PCSE (Bailey et al., 2011). The package provides a function to estimate panel-corrected standard errors for data that may contain balanced or unbalanced panels. The package also provides functions to extract the panel-corrected variance-covariance matrix and to summarize the results of the PCSE estimation (Franzese, 1996).

The PCSE method is based on the assumption that the error variance structure within a panel is constant, but it varies across panels. Additionally, the errors are assumed to be contemporaneously correlated, meaning that the error terms of different panels at the same time period are correlated, but there is no correlation across time. The PCSE method pools information across clusters to estimate the error variances, which leads to more efficient estimates compared to the traditional OLS method (Johnson, 2004, Greene, 2012). PCSE can handle cross-sectional dependence which arises when error terms of different cross-sectional units (e.g. countries and firms) are correlated. This common problem in panel data, especially in macroeconomic and financial applications, and can lead to biased standard errors if not addressed. Driscoll and Kraay (1996) and Hoechle (2007) have shown that PCSE can effectively deal with cross-sectional dependence and provide more inferences. PCSE is based on a large-N (number of cross-sectional units) and large-T (time periods) asymptotic framework which makes it more robust to small sample sizes compared to other methods.

The PCSE method is widely used in the social sciences, where panel data is commonly used. The Beck and Katz (1995) paper is widely cited, and the PCSE method is considered to be a standard tool for analyzing panel data.

Empirical Review

The relationship between financial sector development and economic growth has been a subject of debate among scholars. The supply-leading hypothesis, proposed by Schumpeter (1911) and Patrick (1966), suggests that the financial sector can stimulate economic growth. This view is supported by studies such as Pang and Wu (2009), Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), and Saint-Paul (1992), which argue that an efficient financial sector can improve the quality of investments and, in turn, drive economic growth (Guru et al., 2019).

However, other scholars, such as Meier and Seers (1984), Lucas (1988), Miller (1998), and Blackburn and Hung (1998), believe that financial sector development is a consequence, rather than a cause, of economic growth. This view is referred to as the demand-following hypothesis, as proposed by Patrick (1966). On the other hand, some studies, such as Al-Yousif (2002), have found no relationship between financial development and economic growth, suggesting that the financial sector is irrelevant in certain contexts (Armenta, 2022).

An Empirical Analysis of Indian Economy in the Post Liberalized Era conducted by Kaushal (2016) found that economic growth causes the development of banking institutions however the development of banking institutions does not causes the economic growth. This implies that the banking institutional development which is measured by bank lending does not have much effect on the insurance institutional development or economic growth in India in the short run. Any development in economy or insurance institutions would create a demand for banking functions (intermediary services) which ultimately promotes the development of banking institutions in India (Kaushal, 2016).

In their studies, Demircuc-Kunt & Klapper, (2018) highlighted that financial institutions play a crucial part in fostering entrepreneurship. One of the paramount elements in beginning and expanding a business is capital. Entrepreneurs cannot bring their ideas to market without enough funding. Financial institutions offer capital in several ways, including loans, credit lines, and equity financing. Entrepreneurs may launch or grow their enterprises, as well as invest in cutting-edge research and development (Al-Mahrizi, and AlHabsi, 2018).

3. METHODOLOGY

Data description. In examining the link between entrepreneurship and economic development, panel data of ten African countries sourced from the World Development Indicator (2019) from 2006 to 2016. Economic Development (ED) is



measured by logarithm of gross domestic product per capita, entrepreneurship (ENT) measure by New business density (new registrations per 1,000 people ages 15-64), physical investment proxy by gross capital formation as % to GDP, labour force is the total labor force participation rate as a % of total population ages 15-64, the financial institution is measured by domestic credit to private sector (% of GDP), activities on trading proxy by trade proxy by trade as % to GDP, inflation proxy by Inflation, GDP deflector (annual %) and the interaction of labour force participation rate x Financial Institution.

Methodology. Using the STATA 13.0, this research uses the static panel data to estimate the time series and cross-sectional data from 2006 to 2016. At first, the Pooled OLS model was tested (equation 1), and the model was significant the 1% level of significance. It is likely there maybe individual and time variant in the different African countries studied. This suggests that the Random Effect model be tested. In testing the Random Effect model (equation 2), it is observed that the model was significant at the 1% level of significance. Since the two models were significant, the LM test of Breush-Pagan was conducted to decide the appropriate model out of the two. The result favoured Random Effect model. The outcome of the the test signifies that individual and time variant in the different African countries studied. This means unobserved specific effects exist. Besides, it is paramount to investigate whether or not the presence of unobserved specific effects is distributed independently on the independent variables.

The study further proceeded to examine Fixed Effect model (equation 3) the result indicated that the model significant was at the 1% level of significance. That is, it shows that the presence of unobserved specific effects is not distributed independently on the independent variables. Sequel, the Hausman test is conducted to decide the appropriate model between the Random Effect model and Fixed Effect model. It is noted that the result favoured the Random Effect model which means that the unobserved specific effects exist but not distributed independently on the independent variables (there is no consistency of effect across the African countries studied). Thus, the Random Effect and Fixed Effect model for the study are hereby specified as follows in equation 2 and 3 respectively (see Brooks, 2008).

$$\ln EDit = a + \beta1ENTkit + \beta2Xkit + \dots + \beta kXkit + \mu i \dots \dots \dots (1)$$

where k = 1, ..., J.



$$lnEDit = a + \beta_1 ENTkit + \beta_2 Xkit + \dots + \beta_k Xkit + \omega it \dots \dots \dots (2)$$

where $k = 1, \dots, J$. and $\omega it = \epsilon it + v it$

$$lnEDit = a + \beta_1 ENTkit + \beta_2 Xkit + \dots + \beta_k Xkit + \mu i + v it \dots \dots \dots (3)$$

where $k = 1, \dots, J$. and $\mu it = \lambda t + v it$

Lastly, as it is noted that random effect is associated with serial correlation and the test for it showed that auto correlation exists. So, the result in random effect could not be interpreted. Also, it is likely that the nature of the data we used may have problem of variance in our parameters and multicollinearity among the variables. Therefore, estimation is subjected to heteroscedasticity which indicate its presence. But the variance inflation factor suggested that there is no problem of multicollinearity in the model. Besides, the PCSE technique make the estimation robust because it helps to correct for the problems of heteroscedasticity and serial correlation. In addition, existence of any problem of endogeneity in the model is overcome especially between economic development and entrepreneurship.

Empirical specification of the model. The empirical test for the study followed the model tested in Nnyanzi, Yawe and Ddumba-Ssentamu (2019) as presented in equation 4.

In equation 4, $lnEDit$ is the log of economic development, entrepreneurship is $ENTit$ while other variables in the model are represented by Xit . These variables are physical investment, labour force is the total labor force participation rate, financial institution, trade, inflation and the interaction of labour force participation rate x Financial Institution. All the variables are in rate form. Besides, the parameters were specified in terms of β_1 and β_2 to explain the proportion of independent variables that would cause changes in the dependent variable. α is the constant parameter and μit is the time invariant part of the disturbance term as i and t are the individual and time invariant in the disturbance term.

$$lnEDit = \alpha + \beta_1 ENTit + \beta_2 Xit + \mu it \dots \dots \dots (4)$$

4. RESULT AND DISCUSSION

Following the empirical strategy in the previous section, we presented robust results in Table 1. The result is robust because the PCSE technique corrected for problem of heteroscedasticity and serial correlation. Further, it minimizes the problem of endogeneity in the model. The Pool OLS, Random Effect and Fixed Effect models

are significant at the 1% level of significance. Also, the PCSE model is significant at the 1% level of significance, the final interpretation is based on this model.

Entrepreneur as a variable of interest is significant to determine economic development at the 1% level of significance. This result is robust when compared to the result obtained in Random Effect that is corrected for. That is, increase in entrepreneurship led to increase of 0.01 unit in economic development. Similar result is obtained in Lepojević, Đukić and Mladenović (2016). The action of individual entrepreneurship through new innovations entails new experiment which brought about process of completion and thus, result to viable firms and industries that expand the national economy (Carree & Thurik, 2010). Physical investment and inflation are not significant in the model. Labour Force Participation is significant but adverse to economic development at the 1% level of significance. This result connotes that the contribution of the high population between the ages of 15-64 in Africa was not sound enough to encourage development in the African region. As human capital constitutes small parts of the large labour force.

Financial institution exerts positive impact on economic development at the 1% level of significance. A rise by 1% in financial institution causes increase in economic development by 0.009%. This result is in line with Ifionu and Akinpelumi (2017) who provided that credit facilities given to the entrepreneur boost economic development. Also, trade is positive to determine economic development at the 1% level of significance. That is, when trading activities is improved by 1% economic development increases by 0.006%. But, the result in Nnyanzi, Yawe and Ddumba-Ssentamu (2019) was contrary to this result. The interaction of labour force and financial institution shows that it's capable to enhance economic development at the 1% level of significance. Encourage the large size of labour force with access to finance would encourage their entrepreneurial ideas, a situation that afford many of them to engage in employment thereby reducing unemployment rate in the region.

Table 1
Result of the Economic Development Model Estimation of Panel Corrected Standard Error

Economy Development (DEV) as DV	Pooled OLS	Random Effect	Fixed Effect	Estimation of Panel Corrected Standard Error
Entrepreneurship	0.073*** (4.61)	0.013** (2.06)	0.010* (1.69)	0.061*** (4.93)
Domestic Investment	0.022*** (2.70)	-0.002 (-1.28)	-0.001 (-1.13)	-0.001 (-0.29)
Labour Force Participation	-0.021*** (6.38)	-0.012** (-2.47)	-0.010* (-1.97)	-0.020*** (-6.49)
Financial Institution	0.010*** (6.38)	0.006*** (4.68)	0.005*** (3.96)	0.009*** (7.13)
Trade	0.006** (2.39)	0.002*** (3.41)	0.002*** (3.40)	0.006*** (3.84)
Inflation	0.0008 (0.09)	-0.006*** (-3.50)	-0.007*** (-3.73)	-0.002 (-0.04)
Labour Force Participation x Financial Institution	0.0009*** (2.66)	0.0003*** (3.91)	0.0004*** (4.15)	0.0004*** (2.61)
Constant	7.407	8.144	8.043	8.040
Breusch-Pagan LM test	chibar2(01) = 343.08 Prob> chibar2 = 0.000			
Hausman test	chi2(7) = 3.39 Prob>chi2 = 0.8466			
Observations	110	110	110	110
R-squared	0.7916	0.6916	0.6997	0.9721
F-test (Wald chi square)	55.34	142.43	19.39	469.96
F-test (prob>chi square)	0.0000	0.0000	0.0000	0.0000
Multicollinearity (mean vif)			1.87	
Heteroscedasticity ((x 2 – stat)	-	-	chi2 (10) = 34.27 Prob>chi2 = 0.0002	-
Serial Correlation (F 2 – stat)	-	-	F(1, 9) = 37.256 Prob> F = 0.0002	-

T-statistics are in parentheses, *, ** and *** denotes 10%, 5% and 1% respectively

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

This paper set out to investigate entrepreneurship and economic development and the effectiveness of financial institution and the challenges posed by the ballooning unemployment level, blink prospect of economic development in Africa. The issue has generated intense interest and outcry in recent time. This study therefore, adopted the panel data methodology using the technique of panel corrected standard error analysis. The result showed that the PCSE model is significant at the 1% level of significance; the final interpretation is based on this model. Entrepreneur as a variable of interest is significant to determine economic development at the 1% level of significance. This result is robust when compared to the result obtained in Random Effect that is corrected for. That is, increase in entrepreneurship led to increase of 0.01 unit in economic development. Similar result is obtained in Lepojević, Đukić and Mladenović (2016).

The action of individual entrepreneurship through new innovations entails new experiments which brought about process of completion and thus, result to viable firms and industries that expand the national economy (Carree & Thurik, 2010). Physical investment and inflation are not significant in the model. Labour Force Participation is significant but averse to economic development at the 1% level of significance. This result connotes that the contribution of the high population between the ages of 15-64 in Africa was not sound enough to encourage development in the African region. As human capital constitutes small parts of the large labour force. Financial institution exerts positive impact on economic development at the 1% level of significance. A rise by 1% in financial institution causes increase in economic development by 0.009%.

Recommendation

Government at all level in Africa must deem it critically necessary to initiate, develop and sustain entrepreneurial activities amongst its fledging and vibrant youth. Especially given there domineering number in the continent. Furthermore, government must invest massively on the educational sector to strengthen the human capital population that will aid further productivity level towards promotion of growth and development. The financial institution deserves constant scrutiny and support in the case of creating the right fiscal and monetary policy mix that allow for the deepening of the financial system to attract and mobilize savings and making funds easier and accessible to entrepreneurs to grow and scale their businesses.

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