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DECONSTRUCTING THE IMPACT OF ENTREPRENEURSHIP ON INCOME INEQUALITY IN SUB-SAHARAN AFRICA COUNTRIES

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Abstract. The study examines the impacts of entrepreneurship on income inequality in a panel of 29 Sub-Saharan African countries spanning from 2004 to 2020. The paper employs a dynamic heterogeneous panel approach to differentiate between long-run and short-run impacts of entrepreneurship on income inequality. The findings establish a robust and direct nexus between entrepreneurial activities and income disparity. The results of the two entrepreneurial indicators are stable. Besides, the coefficient of the human capital is positive in the regression and statistically significant at a 5 percent significance level. The proxies for macroeconomic factors exhibit diverse signs and impact, which suggest a policy stimulus aimed at refining macroeconomic situations and also ignite prospects for households to increase their incomes.

Keywords*: Entrepreneurship, Income inequality, dynamic heterogeneous panel, Sub-Saharan Africa.*

JEL Classification: C23, L16, D63, I24

INTRODUCTION

Africa is blessed with abundant resources (natural and human capital) and the economic potentials but failed to create opportunities and livelihood for all the citizens and unemployment continues to be a huge challenge faced by more than two-thirds of Africans. For decades now, Sub-Saharan Africa (SSA) has been experiencing a significant increase in income inequality and extreme poverty (DESA, 2019). Ten of the world's record of unequal countries originated from Sub-Saharan Africa. About 40 % percent reduced income inequality, 90 % reduced health inequality, and 50 % reduced education inequality between 2010 and 2014. The spread of inequality in income, education, and health was accompanied by multifaceted syntheses of inequitable societal customs and lopsided distribution of service provisions (UNDP, 2017). Remarkably, this outlook provides a depiction of the current state of inequality in sub-Saharan Africa and a reflection that young people cannot rely exclusively on the economy and public authorities to provide opportunities. For most developed countries, the activities of the economic agents revolve around social investments with a focus on empowering youth due to their capability to drive growth across all levels of the economy both locally and globally (Thisday, 2019). Hence, this suggests a greater recognition and appreciation around

the globe for individuals willing to create opportunities and employment (Omoruyi, Olamide, Gomolemo & Donath, 2017).

A multitude of empirical studies has focused on an empirical investigation on the relation concerning entrepreneurial undertakings and economic growth (see Schultz, 1990; Mueller, 2007; Sarkara, Rufínc & Haughton, 2017; Antonelli & Gehringer, 2017; Dhahri & Omri, 2018; Halvarssona, Korpib & Wennberg, 2018; Sutter, Bruton & Chen, 2018). These studies indicate that entrepreneurship significantly contributes to sustainability in developed nations. Hitherto, studies have argued that income disparity raises concerns about the global economic meltdown resulting from rising inequality. Besides, another strand of empirical studies contend that a substantial increase in income disparity is compelled by several factors, ranging from educational attainment (Atems & Jones 2015), changes in labour market establishments (Jaumotte & Buitron 2015), income redistribution guidelines (Joumard, Pisu & Bloch, 2012), skill-biased technological adjustment (Acemoglu 1998), monetary policy (Coibion *et al*. 2017), innovations (Tselios, 2011) and economic recession (Atems & Jones, 2015; Frank, 2009). For instance, Tselios (2011) contends that income inequality is related to output growth.

A strand of empirical studies indicates that nations with much rigorous firm entry policies appear to broaden income inequality whilst the other point of view suggests that policy changes aimed at encouraging entrepreneurship raise inequality and can harm development. Perhaps, the typical policy response might be to increase taxes on high-income earners and either to increase social infrastructure or redistribute income directly to deprived households. Even though these measures may lessen inequality in consumption, the government is doing nothing to address the fundamental problem of unemployment. The above scenario suggests that policymaking in the entrepreneurship arena is multifaceted and mixed. The government's policy mix will also depend upon several indicators, including the dominant attitudes of the populace regarding entrepreneurship, the workforce structure, the proliferation of existing business trends, as well as investment rates and entrepreneurial expenditures. There are strong arguments that youth inclusion in the governance remains only a driving force in closing the obvious existing inequality and prosperity gap in the society, see Chambers, McLaughlin & Stanley (2019). This suggests that there is a prevailing gap in linking employment and entrepreneurship within the youths, creating a great layer of social inequality.

Moreover, while the gap between rich and poor continues to widening, it is puzzling that erstwhile studies have has neglected economic agents who take risks to embrace innovation-entrepreneurs. From the empirical credence, it can be deduced that studies did not provide much room for entrepreneurs who could mediate between income inequality and economic growth. Thus, the nexus remains vague and the relationship between the two crucial variables seems to be context-specific. To the best of our knowledge, scanty empirical investigations have been recorded with regards to nexus concerning income inequality and economic growth or with regards to the impact of entrepreneurship (Gutierrez-Romero & Mendez-Errico, 2015; Jung, Seo & Jung, 2018). Given the foregoing, the objective of the study is to examine whether entrepreneurship influences inequality or whether this relationship is purely an empirical coincidence. The study employs the use of Panel

Autoregressive Distributed Lag (PARDL) methodology to explore the effects of entrepreneurship on income inequality of Sub-Saharan Africa. The PARDL is employed in view of the structure and scope of the current study. This is justified by the fact that the methodology offers reliable, non-spurious and precise estimates when a larger number of observations and small cross-sections are used as against the generalized method of moments (GMM) estimator (Pesaran, Shin, & Smith, 2001; Kutu & Ngalawa, 2016). Besides, the methodology is capable of producing estimates of short- and long-run dynamics, and it is compatible with a mixed order of integration such as I(0), I(1), I(1) and I(0) but not I(2) (Shin, Yu, & Greenwood-Nimmo, 2014).

This study contributes to the existing body of knowledge in multi-facets ways. Firstly, entrepreneurship is explored as a crucial indicator reconciling the drive for income equity in sub-Saharan Africa through a PARDL methodology. Concerning the methodology and data, the paper overcomes the endogeneity and heterogeneity. Besides, the paper stresses the impact of entrepreneurial activities on income inequality which erstwhile studies have ignored. The rest of the paper is arranged as follows. The review of the existing literature is presented in Section 2. Section 3 embodies the overall methodology employing a PARDL model and data sources. Section 4 focuses on result discussion, while Section 5 closes and offers policy implications for the paper.

1. LITERATURE REVIEW

Review of Empirical Studies

It appears reasonably in the extant literature that there are two categories of empirical standpoints. The first line of studies focuses on the empirical inquiry on the connection between entrepreneurial activities and output growth (see Antonelli & Gehringer, 2017; Halvarssona, Korpib & Wennberg, 2018; Sarkara, Rufinc & Haughton, 2017; Dhahri & Omri, 2018; Sutter, 2018; Iyigun & Owen, 1997; Schultz, 1990; Mueller, 2007). Stel, Carree, and Thurik (2005), for example, argued that entrepreneurship exerted a direct impact on per capita GDP growth in developed countries, but had an adverse relation in poor countries. Mueller (2007) investigated whether entrepreneurship in West German was the main determinant for knowledge transfer and economic growth for the period of 1990–2002. In addition to the boom in entrepreneurial growth, the author noted the rise in innovative start-up operations. In a panel analysis of 13 developed countries from 2002 to 2007, Galindo and Méndez (2014) examined the relationship between entrepreneurship, innovation, and economic growth. The results demonstrated that economic investment promoted business growth and creativity and increased economic development. Baumol (2014) also reiterated that many entrepreneurial ventures could be an opportunity to foster development that could make policymakers and world leaders more attractive today. Dhahri and Omri (2018) examined the relationship between entrepreneurial activity and output growth in developed countries. The study established that the economic and social aspects of sustainable development in developing countries were driven by entrepreneurial

activities. It, however, made a negative contribution to the environmental aspect. The causality test further confirmed the existence of interactions in entrepreneurship in both short and long run. However, there were inconsistent empirical data on the relationship between business and economic development.

The second category of studies investigates the connection between entrepreneurship and poverty alleviation. For example, Halvarssona *et al*. (2018) stated that entrepreneurship was an instant source of change in earnings for some, but for others, it was a viable explanation for inequality. In their assessment, the share of self-employed workers in the workforce increased the distribution of income by increasing the bottom end of the distribution, while the share of self-employed workers added to the distribution of income at the top end. Sutter (2018) viewed entrepreneurial as a critical tool for poverty alleviation. The author emphasised that recovery, transformation, and change were essential factors affecting entrepreneurship. However, there seems to be a dearth of studies with regards to the examination of nexus between entrepreneurship and income inequality (see Atems & Shand, 2018; Chambers *et al*., 2019; Jung *et al*., 2018; Lippmann, Davis, and Aldrich, 2005; Sarkara *et al*., 2017; Xavier-Oliveira, Laplume & Pathak, 2015). Lippmann, Davis, and Aldrich (2005) provided cross-country evidence on the subject using GEM data. The findings indicated that the rates of entrepreneurial ventures in high-income inequality were higher. Tselios (2011) argued that start-ups could increase their profit by paying rich consumers to new products. This means that income inequality will boost economic growth if opportunities influence entrepreneurs from the advantage of price determination. Mueller, Rosenbusch, and Bausch (2013) argued, however, that equality between radical acceptance of the initial shock and firm performance was a crucial link for equal distribution of income.

Atems and Shand (2018) also reported about the direct business relationship and income inequality. The authors argued that structural reforms to encourage entrepreneurship were increasing inequality and could harm production. Recent research on the relationship between income inequality and new business entry regulations in 115 countries offered by Chambers *et al*. (2019) has provided that countries with stricter regulations for new business openings broaden income inequality experiences. The research is consistent with the results by Lippmann *et al*. (2005). Sarkara *et al*. (2017) also considered the nexus between inequality and the development of business. The authors, relying on cross-sectional data from a large-scale analysis of the individual economic environment across India, argued that greater disparity made many households unable to manage the change to self-employment. Thus, Xavier-Oliveira, Laplume, and Pathak (2015) indicated that more individuals were pursuing entrepreneurship irrespective of the existence of motives, although it was predicted that the majority would be motivated by push factors to improve the respective economic climate.

2. METHODOLOGY

2.1. Method and Data Sources

The study adopts a Dynamic Panel Autoregressive Distributed Lag Model (PARDL) piloted by Pesaran *et al*. (2001). The advantages of the PARDL methodology over other dynamic panel techniques lie in the fact that it has capacities to overcome the problem resulting from inconsistent estimates of the average value of the parameters across countries. The study explores the panel samples of 29 Sub-Sahara African countries for the period of 2004–2020. Countries were appraised from South, West, and East Africa. There are Nigeria, Senegal, Mali, Benin, Burkina Faso, Niger, Cameroon, Ghana, Guinea Bissau, Togo, South Africa, Namibia, Lesotho, Kenya, Rwanda, Angola, Burundi, Central African Republic, Chad, Gabon, Gambia, Guinea, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Uganda, and Zimbabwe. The choice of these countries and the selection of the study period were based on the availability of data.

Table 1. Description of Data

Underlying variables	**Experimental variables**	**Sources**
Inequality	Gini coefficient	United Nations Development Programme; CIA World Factbook; World Development Indicator
Entrepreneurship	Score-Starting a business; Agriculture-employment share	World Development Indicator
Economic performance	GDP per capita growth (annual %)	World Development Indicator
Inflation	Consumer price index (2010 = 100)	World Development Indicator
Unemployment	Unemployment, total (% of the total labour force) (modelled ILO estimate)	World Development Indicator
Real GDP per capita	GDP per capita growth (annual %)	World Development Indicator
Human capital	Gross capital formation as a percentage of gross domestic product	World Development Indicator

In this study, the dependent variable is income inequality and is measured by the Gini coefficient index, which is a scale from 0 to 100. This indicator describes the degree of inequality in the distribution of income of a country. Data on the Gini coefficient index were sourced from two secondary sources, namely the United Nations Development Programme (UNDP) indicators and the World Bank Development indicator. The average data are explored in circumstances in which data were available from two sources. Besides, the meaning and methodologies

discussed for estimating the Gini index are similar among these references (see Jung *et al*., 2018; Lecuna, 2019; Mocan, 1999). Entrepreneurship and other control variables are unlikely to have an impact on inequality at the same rate and may require an explanation of the choice of control variables. The literature on the determining factor of income inequality is massive and therefore the inclusion of control variables should not be overstated. The study uses gross capital formation as an alternative to the effect on inequalities in human resources as a percentage of the gross national product. Conflict findings have been reported in empiric literature on the effect of education on inequality (see Acemoglu, 2002; Lemieux, 2006; among others).

The impact of macroeconomic conditions is also influenced by unemployment and inflation. Empirical studies have also argued for the role of macroeconomic conditions regarding inequalities (Cysne, 2009). Entrepreneurship is measured with the World Bank Development indicator score for starting a business and the share agriculture-employment. The score for the establishment of a business is gauged as the weighted calculation of the scores for each component indicator, ranging from the procedures, time, and expense for the start-up and legitimate operation of an enterprise as a firm or corporation, as well as the minimum capital requirement. The inclusion of share of agriculture-employment as a proxy of entrepreneurship is predicated on the fact that entrepreneurship in the agricultural sector focuses on the ability of farmers to generate new opportunities organised either as new business ventures or as part of the existing business entity (Bryden, *et al*., 1992). The agricultural employment has been generally recognised to have the potential in raising household income, and therefore reducing inequality and poverty (Bryden *et al*., 1992; Siti, Ahmad & Mukaramah, 2012).

2.2. Model Specification

Following Pesaran *et al*. (2001), an ARDL (*p*, *q*, …*q*) is structured as follows:

$$Inq_{it} = \sum_{j=1}^{p} \alpha_{ij} Inq_{i,t-j} + \sum_{j=0}^{p} \delta_{ij} X_{i,t-j} + \mu_i + \epsilon_{it}\,, \tag{1}$$

where X represents the vector of independent variables ranging from entrepreneurship, economic performance, inflation, unemployment, GDP per capita, and human capital. Inq_{it} represents inequality at time (t). Thus, the model is transformed to become equation (2) after parametrizing model equation (1):

$$\Delta Inq_{it} = \varphi_i \left(\Delta Inq_{i,t-1} - \beta_i X_{it} \right) + \sum_{j=1}^{p-1} \alpha_{ij} Inq_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij} \Delta X_{i,t-j} + \mu_i + \epsilon_{it} \tag{2}$$

where β_i represents various vectors that gauge the long-run effect of the independent variables while φ_i stands for the error corrector mechanism effect (ECT). The error terms ϵ_{it} are independently distributed across time and units.

3. DATA ANALYSIS AND INTERPRETATION

The goal of this study is to examine whether entrepreneurship affects income inequality in the countries of Sub-Saharan Africa. Table 2 presents the summary of the variables for the estimation, as well as their descriptive statistics. The descriptive statistics further reveal that the mean and median of all the observations in the dataset lie within the maximum and minimum values. This suggests that there is a tendency for the normal distribution. INQ, CPI, UNEMP, and HUMCAP are positively skewed, while ENTRP and PCg are negatively skewed.

Table 2. Descriptive Statistics

	INQ	**ENTRP**	**CPI**	**PCg**	**UNEMP**	**HUMCAP**
Mean	42.3749	57.9940	117.500	1.74553	5.58961	20.9050
Median	42.4000	62.8000	107.284	1.75661	3.84200	21.6166
Maximum	56.3000	94.5000	382.500	28.6759	27.4640	52.1217
Minimum	31.6000	2.20000	32.1492	−36.5568	0.59900	3.94866
Std. Dev.	5.93308	22.8917	49.3689	4.54500	5.79456	7.25661
Skewness	0.68753	−0.51960	2.27715	−1.80916	2.39215	0.33001
Kurtosis	2.94704	2.35396	10.5310	30.5385	7.97264	3.90841

The study explored the Levin–Lin–Chu test (Levin *et al*., 2002) and the Im–Pesaran–Shin test (Im *et al*., 2003). These stationary tests are structured as the null hypothesis that all the panels contain a unit root. The results of the stationary tests are reported in Table 3. The results of the panel stationary tests reported in Table 3 demonstrate that all variables have fulfilled the requirement for employing a panel ARDL methodology, i.e., the variables consist of a mixture of I(1) and I(0).

Table 3. Panel Stationary (Unit Root) Tests

Variables	**Levin–Lin–Chu test**			**Im–Pesaran–Shin test**		
	T-stat	**Prob.**	**Order**	**T-stat**	**Prob.**	**Order**
INQ	−15.6695	0.0000*	I(0)	−7.19938	0.0000*	I(0)
ENTRP	−4.87146	0.0000*	I(0)	−4.18791	0.0000*	I(1)
CPI	−1.90770	0.0282**	I(1)	−1.72956	0.0419**	I(1)
PCg	−6.52157	0.0000*	I(0)	−4.93918	0.0000*	I(0)
UNEMP	-7.50036	0.0000*	I(1)	−4.73378	0.0000*	I(1)
HUMCAP	−4.16267	0.0000*	I(0)	−3.38009	0.0004*	I(0)

Source: E-view computation (2020)
Note: **5 %, *1 %

The results of the PARDL/PMG are displayed in Table 4. Table 4 shows both long-run and short-run coefficients of the impact of entrepreneurship on income inequality of the twenty-nine SSA countries based on the elasticity of INQ in Equation (2). Both the Gini coefficient and unemployment were used separately as a dependent variable in model equation (2). The PMG estimator assumes that there is homogeneity in the long-run estimators but not in the short-run ones. As a result, the short run suggests that estimators can vary from country to country, which tend to offer inaccurate results due to the differences among countries.

The results of the PMG estimate in Table 4 show that the nexus between entrepreneurship and income inequality is positive and statistically significant in the long run. This meant that if there was some divergence towards a long-term balance, the term of error would adjust the model in such a way that it would return to balance. The findings also reveal that a percentage increase in entrepreneurship, in the long run, would lead to an increase in income inequality of 5 %, with a Gini ratio of 29 SSA countries.

Table 4. Inequality and Entrepreneurship PARDL/PMG Results

Variable	**Coefficient**	**t-Statistic**	**Prob.***
Long-run equation			
ENTRP	0.005808	−0.501370	0.0071
HUMCAP	0.054406	4.087090	0.0001
UNEMP	−0.221376	−3.653583	0.0004
CPI	0.019992	4.138665	0.0001
Short-run equation			
ECT	−1.037220	−4.304192	0.0000
D(ENTRP)	0.138247	2.278968	0.0246
D(HUMCAP)	0.181000	0.643340	0.5213
D(UNEMP)	9.187146	1.500594	0.1363
D(CPI)	−0.191269	−2.652631	0.0092

Source: E-view computation (2020)
Note: **5 %, *1 %

The finding is in tandem with Atems and Shand (2018), Sørensen and Sharkey (2014), and Campbell (2013). The coefficient of the human capital is positive in the regression and statistically significant at a 5 percent significance level. Studies such as Acemoglu (2002), Lemieux (2006) are consistent with our finding that high human capital is correlated with higher inequality. These authors contended that high school wage premium was compelled by an increase in wage inequality. Besides, in terms of the macroeconomic variables, the coefficient signs are inconsistent with expectations. The exhibition of unemployment and inflation

shows negative and positive signs, respectively, and the estimated coefficients are statistically significant at a level of significance of 5 percent.

The finding regarding unemployment is contrary to Mocan (1999), which argues that an increase in unemployment is exacerbating the relative position of low-income groups. The results further reveal that high inflation is linked to higher inequality in income. The implication of the finding suggests that a policy stimulus aimed at refining macroeconomic situations would ignite prospects for households to increase their income.

Table 5. Robustness Analysis

Indicator	Coefficient	t-Statistic	Prob.*
Long-run equation			
ENTRE2	0.026341	1.167252	0.0024
GCF_GDP	0.055522	4.506172	0.0000
UNEMP	−0.386467	−3.993439	0.0001
CPI	0.022589	6.738732	0.0000
Short-run equation			
COINTEQ01	−1.205541	−3.803704	0.0002
D(ENTREP2)	4.646990	0.635591	0.5263
D(GCF_GDP)	−0.047672	−0.538676	0.5911
D(UNEMP)	3.728210	1.209342	0.2289
D(CPI)	−0.010251	−0.066503	0.9471
C	52.89248	3.456678	0.0008

Source: E-view computation (2020)
Note: **5 %, *1 %

The findings presented in Table 5 demonstrate that the share of agriculture-employment in sub-Saharan Africa as the proxy of entrepreneurship to confirm that the selection of the entrepreneurship measure does not compel our outcomes. The findings confirm the positive effects of entrepreneurship on income inequality of Sub-Saharan Africa. Remarkably, the magnitude of the estimated coefficients on income inequality is comparatively similar to the key result proxy with the Gini coefficient (as in Table 4) in exploring the share of agriculture-employment.

CONCLUSION

Over the years, erstwhile studies have ignored the effects of the economic agents who facilitate between income inequality and output growth. The study employs The Panel Autoregressive Distributed Lag methodology to gauge the effects of entrepreneurship on income inequality in 29 countries of Sub-Saharan Africa spanning from 2004 to 2020. The study has analysed Gini coefficient as a

measure of income inequality and two indicators to measure entrepreneurship to validate the robustness of our findings.

The findings have established a robust and direct relationship between entrepreneurial activities and income disparity. The findings of the two entrepreneurial indicators are stable. The findings are in tandem with Atems and Shand (2018), Sørensen and Sharkey (2014), and Campbell (2013). The coefficient of the human capital is positive in the regression and statistically significant at a 5 percent significance level. Studies such as Acemoglu (2002), Lemieux (2006) are therefore consistent with our findings that high human capital is correlated with higher inequalities. The unemployment and inflation display negative and positive signs, respectively, and the estimated coefficients are statistically significant at a 5 percent level of significance.

The implication of these findings suggests that a policy stimulus aimed at refining macroeconomic situations would ignite prospects for households to increase their income. Firstly, the finding that entrepreneurship-income inequality nexus is positive poses a disquieting implication for Sub-Saharan Africa with a belief of intense equal opportunities, which strive to increase business start-up rates. The government should come with policies that will encourage a flexible business start-up policy without subduing an entrepreneurial activity. Besides, public and private endeavours targeted at advancing entrepreneurship may possibly become more efficient by focusing on the transmission of income inequality and the way it is transmitted to individual entrepreneurial drives as well as the impact of human capital.

However, a notable drawback of this study is centred on the inability to gauge various indicators responsible for encouraging entrepreneurship among countries. The future research, therefore, should directly focus on the way informal entrepreneurship affects income inequality in developing economies. Besides, a further research area should be instituted on the causal link among the variables which ought to be inferred from the theoretical underlying. By and large, the future research should define the direction of causality while drawing on different sources of qualitative data.

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