Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.10, No.14, 2020

Impact of Income Inequality on Economic Growth – Evidence from the Ten (10) Biggest Economies in Africa

Eric Inkoom Danso[1*] Evans Kusi Boateng[2]
1.School of Science, Zhejiang University of Science and Technology, No. 318, Hangzhou, Zhejiang, 310023, China
2.Architectural and Built Environment, Kwame Nkrumah University of Science and Technology, Ghana

Abstract
Contributing to existing literature on the relationship between inequality and economic growth, this paper focused on the top ten biggest economies in Africa. There was positive correlation between income inequality and economic growth in the long term. Mean School Year and Gross Savings also regressed positively because it was established that a 1% increase in the number of years spent in school within these countries will causes the economy to grow about 214.76%, and 1% increase in gross savings pushes economic growth by 3.61% annually. Expectedly, unemployment had negative relationship with economic growth. A 1% decrease in unemployment rate within these countries will boost long term economic growth by 7.72%. Due to low educational standard, inadequate technological advancement, high unemployment rate and low human capital, gross capital formation had inverse relationship with economic growth in these countries. The paper recommended that Governments in these countries adopt strategies and approaches such as increase public spending and create employment opportunities, adopt new educational policy to increase the average school years with accompanying improvement in its quality.
Keywords: Economic growth, Income Inequality, African Countries, Gini Coefficient, Unemployment
DOI: 10.7176/JESD/10-14-07
Publication date: July 31st 2020

1. Introduction

Over six decades, many researchers have attempted to answer the brave questions regarding the effects of inequality on economic growth – what is the relationship between inequality and economic growth? Using both panel and cross-sectional, few, larger and more comprehensive cross-country data from different researchers have all attempted to establish the effect of inequality on economic growth, yet each time, the results are inconclusive, indecisive or contradictory. Work from Deininger and Squire (1996) contributed significantly to the literature on the subject matter. Their data set had a panel structure with several consecutive measures of income inequality for each country. This allowed for adoption of more advanced techniques to be used to investigate the effect on economic growth. Despite the various attempts by researchers to establish the effect of income inequality on economic growth, it is in itself is a great concern to the United Nations. In 2015, the United Nations drafted the Sustainable Development Goals (SDGs) with economic growth as one of the core goals of the global initiative [1] (UN, 2015).

Income inequality is sensitive topic in the political, religious and racial space because of its adverse effects on the social, health and psychology of the affected population or areas - Income inequality (1) directly prohibits the poor from staying healthy and accumulating human and physical capital (Aghion, Caroli and Garcia-Penalosa, 1999; Galor and Moav, 2004); (2) it impairs social mobility (Corak, 2013); and (3) decreases the level of equal government representation which directly affect policy formulation and implementation.

Theoretically, economic growth is undeniably a powerful mechanism for reducing poverty but does not necessarily reduces inequality. a country experiencing constant economic growth may not incur any benefits to the poor and vulnerable but rather favours the rich and wealthy. The link between income inequality and economic growth has been extensively investigated by different researchers - Forbes (2000) and Barro (2000), followed by various other studies (Fawaz et al. 2014; Wahiba and Weriemmi 2014; Huang et al. 2015; Madsen et al. 2018; Nguyen et al. 2019; Vo et al. 2019). The current research seeks to provide additional empirical evidence on economic growth and income inequality for the ten biggest economies in Africa, for which to be the best of my knowledge has not been done.

This paper will contribute to discussion by using the latest and most updated data from Work Development Indicators with much focus on Africa's top 10 biggest economies which were ignored in previous studies. The paper will develop a model to establish the correlation existing between income inequality and economic growth using cross-country data obtained from 1990 – 2018. Although, many researchers relied on the data set of

[1] The SDG Goal 8: Decent Work and Economic Growth seeks sustained, inclusive and sustainable economic growth for all of worlds population. This Goal has a target of sustaining annual per capita economic growth of at least 7% for least developing countries. The focus is on the developing economies because the goal is to help these countries catch up with the advanced countries https://www.un.org/development/desa/disabilities/envision2030.html

Deininger and Squire (1996), it has been recently criticized for its accuracy, consistency and comparability (Atkinson and Brandolini 2001; Galbraith and Kum 2005). To that effect, the data set was constructed to maximize comparability based on the study of Solt (2016).

2. Literature Review

Despite the enormous investigative research in an attempt to establish the correlation between income inequality and economic, the contradictory results and findings and different modelling complexities have made it impossible for a solid confirmation. The technical issues of endogeneity and of model specifications together with the diversified application of econometric and variables techniques are considered to be the main factors (Fawaz et al. 2014).

According to Kuznets (1955), inequality was the results of economic growth. Thus, during the early stages of economic development process, inequality increases, and further decreases and the economy grows. This assertion generated mixed research findings from various researchers. Among them, (Lundberg and Squire 2003; Wahiba and Weriemmi 2014; and Rubin and Segal 2015) supported a positive association with the findings of Kuznets while some analyses favoured a negative relationship (Nissim 2007; Majumdar and Partridge 2009) and Some studies also offered a mixed result (Chambers 2010; Huang et al. 2015).

Rubin and Segal (2015) established that there was positive relationship between economic growth and income inequality in the United States between the period of 1953 – 2008. Their study adopted variables such as income stream – total wealth income and labour income; which were sensitive to the growth of an economy and was varied across different income groups. Their results suggested that the sensitivity of income the top 1% population was twice as much of the bottom 90%. they also argued that the income of the top 1% population was more responsive to the difference in the returns from the market.

Using data from World Income Inequality and World Bank, Yang and Greaney (2017) concluded that the correlation existing between economic growth and income inequality is argued to follow the S-shape curve hypothesis using South Korea, Japan, United States and China as the sampled countries under study. They argued that income inequality is significantly affected by economic growth in the long-term. Thus, establishing a positive correlation between economic growth and income inequality in the long-term. However, there was no association between economic growth and income inequality in the short-term in all countries except Japan. They continued to argue that low income earners are induced to work more to meet their basic needs which leads to increase in economic growth. Thus, establishing a positive relationship between income inequality and economic growth.

Chambers and Dhongde (2011) argued for negative link between income inequality and economic growth. Their studies included about 96% of the population of developing countries and measured the growth elasticity of poverty (GEP) and established that, counties with high inequality, the GEP was low and those with lower inequality, the GEP was higher. Forbes (2000) argued that studies with negative correlation findings were not robust because they did not account for omitted bias. She then employed panel estimation to control time-invariant country-specific effects and had positive relationship between economic growth and income inequality both in short and medium term with underlying condition of identifying and controlling the omitted variables such as corruption, government spending on education and healthcare.

Clarke (1995) also had negative relationship as far as income inequality and economic growth are concerned after using different economic variables. The study used Gini coefficient and coefficient of variance of income and the Theil Index. It established that there was data problem particularly the income since it was not from the same year and in some countries under the study, he could not establish whether it was gross or net income. Despite these shortfalls, he established that income inequality negatively correlates with economic growth and decreasing the income inequality by 1 standard deviation caused approximately 1.3% increase in economic growth. Although, he did not consider policies that sort to favour the rich and did not determine the direction or casualty, he concluded income inequality do not drive economic growth.

Fawaz, Rahnama, and Valcarcel (2014) contributed to the body of literature in a quest to establish the relationship between income inequality and economic growth by focusing on developing countries. Their model used data from World Bank in 2012 on 111 sampled developing countries – classifying the developing nations into High- (HIDC) and low-income (LIDC) developing countries. Using multiple regression analyses, the results were indecisive. Income inequality correlated positively on economic growth with LIDC and negative correlated relationship was established between income inequality and economic growth for HIDC. They suggested however that the indecisive relationship may be nonlinear. Due to variables and economic similarities of the sampled countries of Fawaz, Rahnama and Valcarcel and the sampled countries with this paper, this nonlinear relationship is taken into account.

This paper attempts to add to the body of literature on the relationship between income inequality and economic growth with data set from 1990 – 2018 from World Bank Indicators

3. Methodological Approach and Data

3.1 Data

The study derived data from the World Development Indicators and United Nations Development Programme under Human Development Report. The data is a panel data of 10 of African's biggest economies observed from the period between 1990 – 2018. The independent variables adopted for this paper were Gini coefficients, Unemployment, Gross National Savings, Mean School Year, and Gross Capital Formulation. These variables were chosen because the paper sort to consider all other factors that could potentially impact both income inequality and economic growth. The Gini coefficient was chosen because it is the common measure of income inequality in a country; unemployment was chosen because this variable directly affects the purchasing power of residents; the mean school year variable was adopted because this contribute to human capital and human resources which directly affect economic growth; gross national savings was used because the level of inflation needed to be controlled – the level of inflation directly affect the level of national savings which contribute to economic growth; and gross capital formulation was used as a variable because it increases the size of national output, income and development which tends to solve the problems of inflation and balance of payment. These independent variables were regressed on the dependent variable (Annual Gross Domestic Product Growth Rate). This was because income inequality was believed to have more impact on GDP than the impact of GDP on income inequality.

The list of countries included in the study are; Nigeria, South Africa, Ghana, Kenya, Ethiopia, Algeria, Morocco, Ethiopia, Ivory Coast, and Angola[1].

Variable	Definition	Source
y	Annualized Gross Domestic Product Growth Rate	WDI
Gini	Gini index (World Bank estimate)	WDI
Gross	Gross savings (% of GDP)	WDI
UNEM	Unemployment (% of total labour force) (national estimate)	WDI
MSY	Average Mean School Year	HDR
GCP	Gross capital formation (% of GDP)	WDI

3.2 Model Consideration

The model adopted for the multiple regression in attempt to establish the relationship between economic growth and income inequality is stated below:

$$\mathcal{Y}_{i,t} = \beta_0 + \beta_1 \text{GINI}_{i,t} + \beta_2 \text{Gross}_{i,t} + \beta_3 \text{UNEM}_{i,t} + \beta_4 \text{MSY}_{i,t} + \beta_5 \text{GCP}_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $\mathcal{Y}_{i,t}$ = the annualized growth rate of the real GDP of the observed in a country i at time t. β_0 is the intercept of the regression model, β_1 $\text{GINI}_{i,t}$ is the Gini coefficient of country i at time t, β_3 $\text{UNEM}_{i,t}$ is the unemployment rate in country i at time t, β_4 $\text{MSY}_{i,t}$ is the average mean school year in country i at time t, β_5 $\text{GCP}_{i,t}$ is the Gross Capital Formation in country i at time t and the $\varepsilon_{i,t}$ is the stochastic error

[1] According to Wikipedia, sourced from data from International Monetary Fund, these countries forms the largest 10 economies in Africa. Although, the differences in the cost of living was not considered.

4. Results and Discussion

OLS Regression Results

Dep. Variable:	GDPGR	R-squared:	0.511
Model:	OLS	Adj. R-squared:	0.405
Method:	Least Squares	F-statistic:	4.804
Date:	Sun, 12 Jul 2020	Prob (F-statistic):	0.00375
Time:	00:26:10	Log-Likelihood:	-56.214
No. Observations:	29	AIC:	124.4
Df Residuals:	23	BIC:	132.6
Df Model:	5		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	-5.5258	5.757	-0.960	0.347	-17.436	6.384
GINI	0.0971	0.101	0.959	0.347	-0.112	0.307
MSY	2.1479	0.623	3.447	0.002	0.859	3.437
UNEM	-0.0772	0.240	-0.321	0.751	-0.575	0.420
GSVNS	0.0361	0.098	-0.369	0.716	-0.238	0.166
GCP	-0.2362	0.116	-2.039	0.053	-0.476	0.003

Omnibus:	2.364	Durbin-Watson:	2.272
Prob(Omnibus):	0.307	Jarque-Bera (JB):	1.096
Skew:	0.290	Prob(JB):	0.578
Kurtosis:	3.755	Cond. No.	780.

The study adopted other economic variables to control for the Gini coefficient as a measure of inequality. The Gini coefficient variable correlated positively with economic growth. The mean school year and gross savings also regressed positively with economic growth whereas unemployment and gross capital formation had negative relationship with economic growth as far as income inequality was concerned. The model had an R2 value of 0.511 or 51.1% of the variance in GDP growth. At 5% significant level, only MSY was significant despite GINI and GSVNS also having positive relationship with the dependent variable (GDPGR). To check for the normality of the data set, a Jarque-Bera test was conducted. The result of 1.096 obtained for Jarque-Bera test indicated that the null hypothesis (the data is normally distributed) was rejected at 5% significant level. Durbin-Watson was conducted to test the null hypothesis that the residuals from the regression were not autocorrelated from the alternative hypothesis. With a sample size of 10 biggest economies from Africa and five (5) independent variables (Gini coefficient, Gross Savings, Unemployment Rate, Mean School Year and Gross Capital Formation), the value was 2.272. From the Durbin-Watson table proposed by Savin and White (1977), the tabulated value falls within the interval dL and dU ($0.150 \geq 2.690$) at 5% significant level. As a result, we reject the null hypothesis of non-autocorrelated errors in favor of the hypothesis of positive first-order autocorrelation.

The positive relationship obtained from Gini coefficient and economic growth support the initial hypothesis for this research. One percentage point increase in the Gini coefficient increases economic growth by 9.7%. This could be that economic wealth of these top 10 biggest economies in Africa are concentrated in the hands of about 1% of the population. Thus, as income inequality increases, economic growth keeps increasing due to possible factors that, the few wealthy individuals influence economic growth through an increase in level of investment, increase in infrastructure, etc. This positive relationship contradicts the findings of (Deininger and Olinto 1999; Castelló-Clement 2004; Halter et al. 2014) who suggested that income inequality decreases economic growth. The results however support the findings of Fawaz, Rahnama, and Valcarcel (2014) who argued for a positive relationship between income inequality and economic growth in High-Income Developing Countries. This is relevant to this study because the concentrated countries adopted are classified as High-Income Developing Countries – top Ten (0) biggest economies in Africa by International Monetary Fund. Using a 20-year period, the results supports the findings of Yang and Greaney (2017) who argued that there exists positive relationship between income inequality and economic growth in the long term although follows the S-shape curve hypothesis. Observing from the results, although positive relationship was obtained, it was only 9.71% which indicates that the results could be indecisive with time. The relationship could be positive for a while return back to negative depending on all other variables in the long-term.

The positive correlation between gross savings and economic growth is consistent with the results from (Clarke, 1995; Aghion, Comin, Howitt and Tecu, 2009) who argued that an increase in the level of savings in any

given economy will lead to an increase in innovations and foreign direct investments in all sectors of the economy. This holds to be true as observed in these countries under study because in the last decade, foreign investment in these countries have been increasing which has consequently increased economic growth. The results indicate that a 1% increase in gross savings pushes economic growth by 3.61% annually. Further, Mean School Year regressed positively with economic growth which means that, 1% increase in the number of years spent in school will boost economic growth by 214.79%. This implies that, as more students graduate in any given year, it adds pressure to the limited economic resources which affect economic growth. However, when these students spend more years in school, it will relieve pressure from the economy. This holds to be true because from the observed countries, there are many graduates competing for the limited jobs and resources so an increase in school years will increase economic growth significantly in the long term.

The negative relationship with unemployment and economic growth sides with the presumptive hypothesis of the paper. A one percent decrease in the unemployment rate increases economic growth by 7.72% both in short- and long-term. This observed relationship satisfies the Okun's Law which implies that a 1% decrease in unemployment rate in any given economy increase GDP by 2% and 1% decrease in unemployment will decrease the Gross National Product by 3% (Fuhrman, 2012). For this relationship to be sustained in the long-run, there should be growth in potential output – which measures the economic capacity to produce goods and services when all factors of production are fully utilized. When the economy continuous to grow, it will influence policy makers to undertake stimulus policies to further decreases the unemployment rates. The Gross Capital Formation variable consists of both tangible (plants, tools and machinery) and intangible goods (education, health, etc.). (Singer, 1950). The negative relationship observed in these countries could be as a result of many factors such as: low private investment which is composed of fixed and movable assets. These physical resources increase production and quality of goods. The observed countries heavily rely on import of goods and services for their survival which gives low private investments; another factor could be the characteristic of labour force. These countries are having youthful population with fewer well paid jobs so the informal sector dominate the job sector which is difficult to quantify and be relied upon; and lastly, human capital could also be a contributing factor as to why gross capital formation regressed negatively. This is because, in these countries, the quality of education is low with accompanying low mean school year as compared to developed countries. These countries also have average health system lacking the advanced technologies and scientific knowhow to increase the human capital of her citizens as compared to the developed or advanced nations.

5. Conclusion and Policy Implications

The paper contributed to the body of literature on the relationship between income inequality and economic growth focusing on the ten biggest economies in Africa. The paper established a positive correlation between economic growth and income inequality. Thus, when the income inequality increases, the economy grows. This was as a result of fewer population in those countries controlling wealth and investing in the respective countries. The paper established a positive relationship between economic growth with gross savings and mean school years. This implied that an increase in number school years in these countries will in the long-term causes the economy to grow and increase in gross savings will increase the country's innovative and technological prospects which will encourage foreign investors and will boost economic growth.

There were no surprises with unemployment and gross capital formation regressing negatively with economic growth in these countries. As more of the labour force in these countries get employed, they increase their spending and productivity which derives economic growth in the long term. Due to inadequate human capital, inadequate health and technological advancement, and low quality of education, the gross capital formation capacities of these countries under study are affected and thus, have inverse relationship with economic growth as compared to other advanced countries.

The Governments in these countries should adhere to make radical changes to her approach towards reducing the inequalities by implementing the various strategies. These Governments should make deliberate effort to increase their technology "know-why" which will boost foreign investments and also attempt to shift from the primary sector to more secondary producing nations. The Governments should also increase public spending which will reduce unemployment which in the long term reduces the income inequality gap. This reduction will reduce migration from these African countries to advanced world in search of greener pastures. The retained human resources will in the long term causes the economy to grow through an increment in potential output. The Governments should also see to introduce educational plan to increase the mean school years in order to relieve the respective economies from pressures from these unemployed graduates.

References

Aghion, Philippe, Eve Caroli, and Cecilia Garcia-Penalosa, 1999. *Inequality and economic growth: the perspective of the new growth theories (CEPREMAP, CEPREMAP Working Papers).* s.l.:Couverture Orange.

Atkinson, Anthony B., and Andrea Brandolini., 2001. Promise and pitfalls in the use of "secondary" data-sets:

Income inequality in OECD countries as a case study. *Journal of Economic Literature,* Issue 39, p. 771–99.
Barro, R. J., 2000. Inequality and Growth in a Panel of Countries. *Journal of Economic Growth,* Issue 5, p. 5–32.
Blinder, A., 1997. Is There A Core of Practical Macroeconomics That We Should All Believe?. *American Economic Review,* 87(2).
Chambers, D., 2010. Does a rising tide raise all ships? The impact of growth on inequality. *Applied Economics Letters,* Issue 17, p. 581–86.
Chambers, D. and Dhongde, Shatakshee., 2011. A Non-parametric Measure of Poverty Elasticity. *Review of Income and Wealth ,* Issue 57, pp. 683-703.
Clarke, G. R. G., 1995. More Evidence on Income Distribution and Growth. *Journal of Development Economics ,* Issue 47, pp. 403-427.
Corak, M., 2013. Income Inequality, Equality of Opportunity, and Intergenerational Mobility. *Journal of Economic Perspectives,* Issue 27, pp. 79-102.
Deininger, Klaus, and Squire, Lyn., 1996. A new data set measuring income inequality. *World Bank Economic Review,* Issue 10, pp. 565-591.
Fawaz, Fadi, Masha Rahnama, and Victor J. Valcarcel., 2014. A Refinement of the Relationship between Economic Growth and Income Inequality. *Applied Economics,* Issue 46, pp. 3351-3361..
Forbes, K. J., 2000. A Reassessment of the Relationship between Inequality and Growth. *American Economic Review,* Issue 90, pp. 869-887.
Furhman, R. C., 2012. Okun's Law: Economic Growth and Unemployment. *Rational Analyst*, 13 December, pp. 1-6.
Galbraith, James K., and Hyunsub Kum., 2005. Estimating the inequality of household incomes: A statistical approach to the creation of a dense and consistent global data set. *Review of Income and Wealth,* Issue 51, p. 115–43.
Galor, Oded, and Moav, Omer., 2004. From Physical to Human Capital Accumulation: Inequality and the Process of Development. *Review of Economic Studies ,* Issue 71, pp. 1001-1026.
Huang, Ho Chuan, WenShwo Fang, Stephen M. Miller, and Chih-Chuan Yeh., 2015. The effect of growth volatility on income inequality. *Economic Modelling ,* Issue 45, p. 212–22.
Kuznets, S., 1955. Economic Growth and Income Inequality. *American Economic Review,* Issue 45, p. 1–28.
Lundberg, Mattias, and Lyn Squire., 2003. The simultaneous evolution of growth and inequality. *The Economic Journal,* Issue 113, p. 326–44.
Madsen, Jakob Brochner, M. Rabiul Islam, and Hristos Doucouliagos., 2018. Inequality, financial development and economic growth in the OECD, 1870–2011. *European Economic Review,* Issue 101, p. 605–24..
Majumdar, Shibalee, and Mark D. Partridge., 2009. *Impact of economic growth on income inequality: A regional perspective..* Milwaukee, WI, USA: Paper presented at the Agricultural and Applied Economics Association.
Nguyen, Cong Thang, Vo The Anh, Pham Ngoc Thach, Do Thanh Trung, and Vo Hong Duc., 2019. Gender-Based Attitudes toward Income Inequality in the Asia-Pacific Region.. *Emerging Markets Finance and Trade.*
Nissim, B.-D., 2007. Economic growth and its effect on income distribution. *Journal of Economic Studies,* Issue 34, p. 42–58.
Rubin, Amir, and Dan Segal., 2015. The effects of economic growth on income inequality in the US. *Journal of Macroeconomics,* Issue 45, p. 258–73.
Savin, N Eugene and White, Kenneth J., 1977. The Durbin-Watson Test for Serial Correlation with Extreme Sample Sizes or Many Regressors. *Econometrica,* 45(8), pp. 1989-96.
Solt, F., 2016. The StandardizedWorld Income Inequality Database. *Social Science Quarterly,* Issue 97, p. 1267–81.
UN, 2015. *UN adopts new Global Goals, charting sustainable development for people and planet by 2030 (UN News Centre).* [Online]
Available at: https://www.un.org/development/desa/disabilities/envision2030.html
[Accessed 01 July 2020].
Vo, Hong Duc, Nguyen Van Phuc, Nguyen Minh Ha, Vo The Anh, and Nguyen Cong Thang., 2019. Derivatives market and economic growth nexus: Policy implications for emerging markets.. *North American Journal of Economics and Finance.*
Wahiba, Nasfi Fkili, and Malek El Weriemmi., 2014. The Relationship Between Economic Growth and Income Inequality.. *International Journal of Economics and Financial Issues,* Issue 4, p. 135–43.
Yang, Yiwen, and Theresa M. Greaney., 2017. Economic growth and income inequality in the Asia-Pacific region: A comparative study of China, Japan, South Korea, and the United States. *Journal of Asian Economics,* Issue 48, pp. 6-22.