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Globalization and income inequality: A panel data analysis of 37 developing countries in Africa

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Abstract

The lack of economic facts on the effects of globalization and income inequality in Africa has made it difficult for an effective economic policy response to the problem of inequalities in the continent. Against this backdrop, this paper examined the nexus between globalization and income inequality by estimating Ordinary Least Square (OLS) and the Random model for Panel data of 37 developing countries in Africa over the period of 1970 to 2014. The relationship between income level and income inequality justifies the validity of Kuznets' U hypothesis. The results showed a negative relationship between the total globalization index and income inequality after taxes and transfer for the (OLS). Results for the globalization sub-indicators such as economic globalization showed a robust positive significant relationship for both measures of income inequality measures (*Gini net and Gini market*), while political globalization showed a negative relationship with both income inequality measures. It is recommended that government in African countries should strengthen their institutions to promote policy frameworks that will increase income levels and the human capital capacity, while steps should be taken to control the ever-increasing population and age dependency ratio.

Keywords: Globalization, income inequality, panel econometrics, gini coefficient, Africa, JEL: C23, F62, O55

Introduction

The effects of globalization on income inequality had been a source of debate among researchers and policymakers. The background of the debate on globalization; the gainer or loser within and between countries of the world is of utmost concern for economists (Ogunyomi *et al.*, 2013) [24]. Globalization was generally perceived as a tool for promoting global economic growth, while Stiglitz, (2003) [33] and Mahnoor and Kashif (2016) [19] criticized it for growing income inequality, difficulty in competition, and social and environmental degradation, especially in developing countries like Africa. Globalization is a multidimensional phenomenon that captures all aspects of the social, political, economic, and cultural domains. It is a comprehensive process of economic integration which develops international mobility of national resources and increases the interdependency of the national economy (OECD, 2005).

Many scholars in the last decade had reported a positive relationship between globalization and income inequality (Bergh and Nilsson 2010 [1]; Jaumotte *et al.*, 2013 [14]; Dabla-Norris *et al.*, 2015 [3]; Gozgor and Ranjan 2017 [10]; Dornet *et al.*, 2018) [5], especially in emerging countries. These positive effects of globalization are vividly seen among Asia Tigers like Japan, China, Singapore, and South Korea. Their remarkable growth of these countries of East Asia rose per capita income by eightfold and raised hundreds of millions out of poverty (OECD, 2005). However, most African countries that had embraced globalization had resulted in structural economic divergence by widening income inequality, collapsed infant industries because of the dependency on international theory, and less economic convergence informed by technology transfer, increased market size, and relative employment generation (Ogunyomiet *et al.*, 2005). The actual benefit of globalization to African countries faces more uncertainty due to serious data concerns, which are more likely to be subject to measurement errors and lack of data records in the time past (Deaton, 2005 [4]; Jenkins, 2015) [15]. This lack of economic facts on the effects of globalization and income inequality in Africa has made it difficult for an effective economic policy response to the problem of inequality in the continent. This calls for a sound understanding of the key factors that drive the inequality trends.

Various factors are likely to play a role, these include globalization, real Gross Domestic Product (GDP), age dependency ratio, human capital, skill-biased technological change, economic reforms such as deregulation in financial markets, rolling back the welfare state, or reforms of the tax system, the growing role of telecommunication and the mass media, growing regional disparities within countries and many more (Dorn *et al.*, 2018)^[5].

This research established the relationship between globalization and income inequality in Africa, using expanded and recently updated data. The impact between globalization and its sub-indicators was differentiated on i) market income inequality and ii) net income inequality i.e. income inequality after taxes and transfers Gini indices taken from Solt's (2016) Standardized World Income Inequality Database ((SWIID7_1). Due to the multifaceted nature of globalization, the KOF index of globalization such as the economic, trade, social, and cultural globalization index (Dreher 2006^[6]; Dreher *et al.*, 2008)^[7], was used to see the effect of each on income inequality in Africa.

The rest of the paper is organized as follows: Section two concisely reviews the relevant literature on globalization and income inequality. The third section presents models for estimating the influences of globalization on income inequality along with a description of the data and variables applied in the paper. The results of the models are interpreted in section four. Conclusions and policy considerations are presented in the final section.

2. Methodology

The baseline panel model was estimated following the characteristic model (Park 2017)^[25] had utilized, where

countries are described by *i* and 5-year-periods by *t* as follows:

$$Gini_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 (Y_{it})^2 + U_{it} + \varepsilon_{it} \quad (1)$$

Where Gini is the Gini index, an indication of income inequality

ln Y Is shorthand for the logarithm of income of per capita GDP, which generally represents the level of economic development? *u_{it}* is the between-entity error and *ε_{it}* is the within-entity error. All variables are included as averages in each of the nine periods (t = 1..., 9). A positive sign was assumed for *α₁* while a negative sign is predicted for *α₁*.

Other explanatory variables were included in the baseline model along with the income variables to better analyze income inequality. The variables included are; the country's globalization level, its degree of freedom, human capital index, population, and age dependency ratio. Relevant significant control variables are added to equation (2) as shown below;

$$Gini_{it} = \alpha + \beta_1 \ln Y_{it} + \beta_2 (\ln Y_{it})^2 + \beta_3 \ln HCI_{it} + \beta_4 \ln KOFI_{it} + \beta_5 \ln P_{it} + \beta_6 \ln A_{it} + \beta_7 \ln EFI_{it} + U_{it} + \varepsilon_{it} \quad (2)$$

where *lnHCL* represents the logarithm of the Human Capital Index, *lnKOFI* is the logarithm of the KOF globalization index, *lnP* is the logarithm of population, *lnA* is the logarithm of age dependency ratio and *EFI* is the logarithm of economic freedom index.

3. Results and Discussions

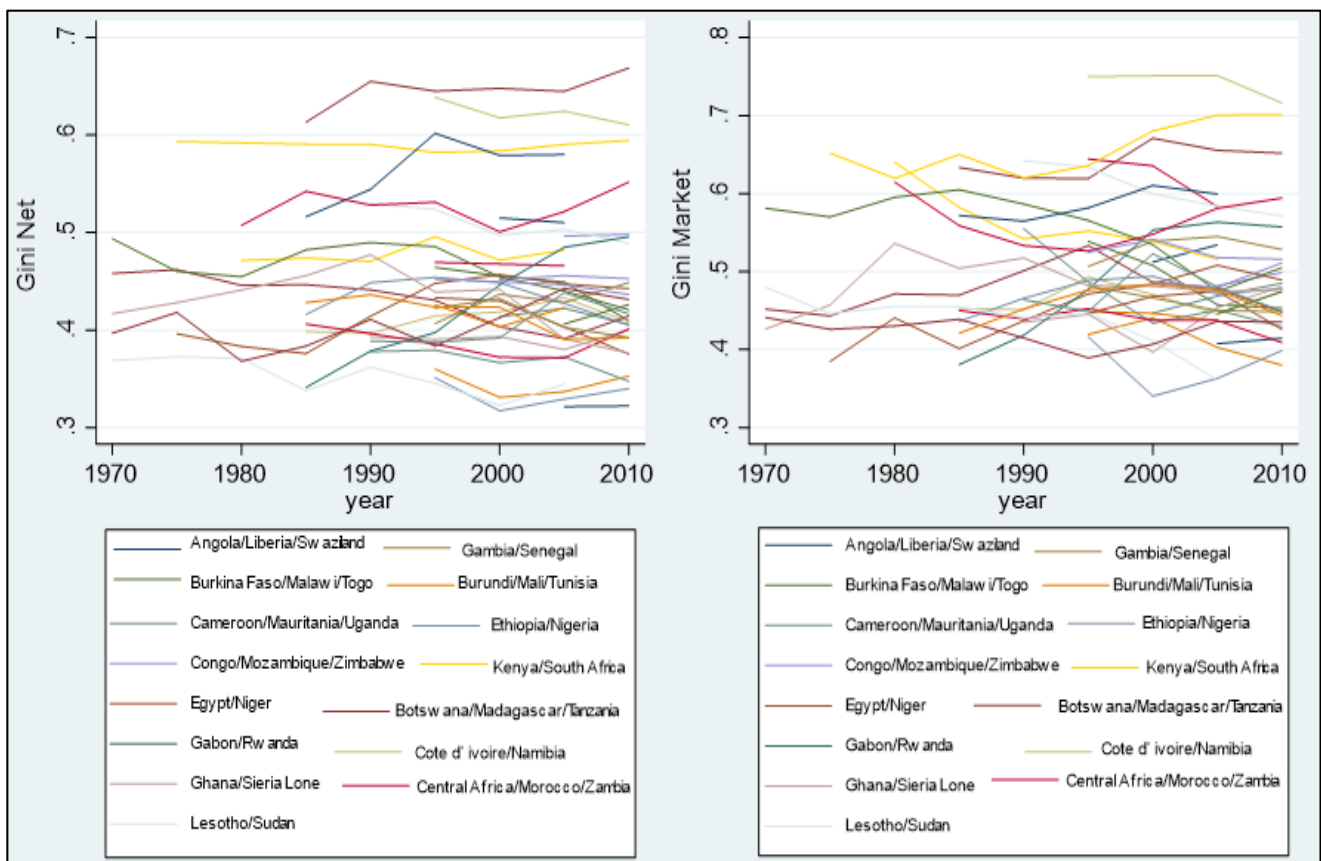


Fig I: Gini income inequality in Africa i.e. (Gini market and net Gini between 1970-2014)

Table 1: Variable and Data Sources, based on nine 5-year averaged periods between 1970 and 2014

Variables (Dependent)	Data Sources	Definitions
Inequality variables		
Gini net	Solt's (2016), SWIID7_1)	Gini post-tax and transfer
Gini market		Gini post-tax and transfer
Globalization variables		
Globalization index	Dreher (2006) ^[6] , update KOF 2016	KOF index of globalization index
Economic globalization index		KOF index of economic globalization index 2016
Trade globalization index		KOF index of social globalization index 2016
Social globalization index		KOF index of social globalization index 2016
Political globalization index		KOF index of social globalization index 2016
Cultural globalization index		KOF index of social globalization index 2016
Covariate variables		
Real Gross Domestic Product	Feenstra <i>et al.</i> , (2015) ^[8] , PWTv9.0	Real Gross Domestic Product (USD)
Human capital index		Index based on the rate of return to education and average years of schooling
Population	World Development Indicators (WDI, 2017) ^[35]	Total population in millions
Age Dependency Ratio	World Development Indicators (WDI, 2017) ^[35]	Age Dependency Ratio
Economic Freedom Index	Gwartney <i>et al.</i> , (2015)	Index of economic freedom

Fig (ii) above showed the graphical trends of Gini income inequality (Gini market and Gini Net) in Africa based on nine periods of 5-year averages between 1970 and 2014 used for the study. Despite the improvement in SWIID data over time, some observations of the Gini index were still missing from the data set.

3.1. Relationship between income level and income inequality (Baseline model)

Table 2 below showed the regression results for estimating the income level and income inequality. The empirical results validate the Kuznets hypothesis (Kuznets 1955)^[17], a

pioneered study that claimed that income inequality would first increase within poor countries as their economies grew through urbanization and population growth but after some point, inequality would fall as a result of subsequent political factors and economic policies. An inverse U-shaped curve relationship for Gini Net while Gini Market reveals a U-shaped curve. The entire coefficient for Gini Market was statistically significant at 5%. The finding showed that the relationship between income inequality and income in Africa was of a U-shaped curve relationship. The R^2 tends to be very small as a result of the nature of the panel data used for the study.

Table 2: Regression Estimation of Gini income inequality on income based on nine periods using 5-year averages between 1970 and 2014

Variables	Gini Net (RE)	OLS	Gini Market	OLS
LnY	0.013 (0.028)	-0.102** (0.099)	-0.088** (0.039)	-0.199*** (0.052)
(LnRGDP per capita) ²	-0.0004 (0.001)	0.005** (0.002)	0.004** (0.002)	0.009*** (0.003)
Constant	0.359** (0.154)	0.962*** (0.255)	0.953*** (0.212)	1.541*** (0.266)
No. of observations	187	187	187	18
No. of country	37			37
R-Squared	0.0002	0.076	0.076	0.078

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.2 Relationship between Globalization and Income inequality

Table 3 below showed the relationship between Gini income inequality and globalization index with other covariate variables. The result showed an improvement in the R^2 statistic, especially in the Gini Market. The result of the Gini market confirmed the finding of previous studies (Ogunyomiet *al.*, 2013^[24], Ogbeide and Agu 2015^[23]) indicating a positive relationship between globalization and income inequality while the result of the Gini net was negative and statistically insignificant. The only significant variable in the Gini net is the age dependency ratio, which

indicates a negative relationship between the age, dependency ratio, and income inequality but was not significant in the Gini market. The globalization index was found to be positively significant in the Gini market while the population was found to be negatively significant in the Gini market. This finding is in line with Dorn *et al.*, (2018)^[5], who discovered that the coefficient of the globalization index is larger when the Gini market index (before taxation and transfers) was used than when the Gini net inequality index (after taxes and transfers) was used as the dependent variable.

Table 3: Random effects estimates of income inequality on globalization and others covariate, based on 9-periods using 5-year averages between 1970 and 2014

Variables	Gini Net (RE)	OLS	Gini Market	OLS
LnRGDP per Capita	0.054 (0.038)	-0.057 (0.051)	-0.036 (0.046)	-1.67*** (0.058)
(LnRGDP per capita) ²	-0.002 (0.002)	0.003* (0.002)	0.002 (0.002)	0.009*** (0.003)
Ln human capital index	-0.001 (0.062)	0.222*** (0.049)	0.040 (0.062)	0.270*** (0.056)
Ln KOF Globalization Index	-0.004 (0.031)	-0.040 (0.033)	0.026 (0.033)	-0.072* (0.038)
Ln Population	-0.015 (0.021)	-0.047*** (0.033)	-0.047*** (0.013)	-0.043*** (0.011)
Ln Age Dependency Ratio	-0.041* (0.024)	-0.011 (0.034)	-0.023 (0.030)	0.022 (0.038)

Ln Economic Freedom index	-0.013 (0.015)	0.001 (0.032)	0.002 (0.019)	0.032 (0.036)
Constant	0.371 (0.238)	0.740*** (0.293)	0.714** (0.287)	1.242*** (0.333)
No. of observations	152	152	152	152
No. of country	37			37
R-Squared	0.063	0.432	0.300	0.413

Source: Authors Computation, 2018 Note: Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4 below showed the results of Random Effects and OLS regression for the individual globalization indicators using economic, trade, social, political, and cultural dimensions of the KOF globalization index. The coefficient of economic globalization was positive and statistically significant at the 5% in both forms of Gini income inequality used. The coefficient of the trade globalization index was positive and statistically significant in the Gini market but not statistical significance in the Gini net income inequality. The coefficient of social globalization was

negatively related to income inequality in both Gini measures but not statistically significant in both Gini income inequality measures. Political globalization was negative and statistically significant at 5% related to both income inequality measures. Also, cultural globalization was negative in both Gini measures but statistically significant in the Gini market income inequality measure. In the overall model, the coefficients of the Gini market are more robust than that of the Gini net.

Table 4: Sub-indicators of Globalization: Panel random effects estimates, based on nine periods using 5-year averages between 1970 and 2014

Variables	Gini Net (RE)	OLS	Gini Market	OLS
Economic Globalization	0.028** (0.013)	0.070** (0.021)	0.061*** (0.173)	0.048* (0.024)
Trade Globalization	0.011 (0.009)	0.026* (0.013)	0.026** (0.011)	0.026 (0.016)
Social Globalization	-0.013 (0.014)	0.016 (0.021)	-0.018 (0.186)	-0.018 (0.025)
Political Globalization	-0.040** (0.018)	-0.129** (0.021)	-0.053** (0.024)	-0.137*** (0.024)
Cultural Globalization	-0.003 (0.008)	0.029 (0.015)	-0.018* (0.011)	0.021*** (0.017)
Control Variables	Yes	Yes	Yes	Yes

Sensitivity Tests

The sensitivity (Hausman) test was carried out on the Fixed and Random Effects Model for the study. The probability of the chi (2) was 0.923 and 0.766 for the Gini net and market respectively, (< 0.005) i.e. not significant, hence random effect. The Breusch and Pagan Lagrangian multiplier test for random effects for all the models was significant; hence we accept the null and conclude that random effects were appropriate.

4. Conclusion and Recommendations

This study examined the relationship between globalization and income inequality in 37 developing countries in Africa. Globalization was generally perceived as a tool for promoting global economic growth and social progress, but this view has been criticized by some prominent scholars for escalating income inequality. Though, globalization is a multidimensional phenomenon that captures all the aspects of social, political, economic, and cultural domains. Findings from the study validate the Kuznets' U hypothesis for the relationship between income level and income inequality in Africa. The study also showed a negative relationship between the total globalization index and income inequality after taxes and transfer for the Ordinary Regression System (OLS). The result for the globalization sub-indicator showed a positive significant relationship between economic globalization with both measures of income inequality measure (Gini net and Gini market), while political globalization indicated a negative relationship. The results of trade and cultural globalization were mixed based on the type of Gini income inequality used, while social globalization did not indicate any statistically significant relationship to income inequality regardless of the Gini income inequality measure used. Based on the findings from this study, African countries should demonstrate good governance levels in terms of fiscal policy, protectionist domestic policy, political stability, and sound qualitative education to help in human

capital development and sustainable economic globalization. Also, they should strengthen their institutions to promote policy frameworks that will increase income levels while steps should be taken to control the ever-increasing population and age dependency ratio. There are many issues to be addressed regarding globalization and income inequality. Hence, further study should focus on other measures of inequality since this study used the Gini coefficient. Also, the area of information communication technology (ICT) and mobile phone data that are not available will be a good area of research interest as they reduce income inequality.

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