

# The Effects of Foreign Aid on Income Inequality in Africa

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## Abstract:

This paper examines the correlation between donations of foreign aid given to African countries and the income inequality, measured using the Gini coefficient, within those countries. A panel method is used in order to analyze trends in a number of countries over a period of time. The independent variables in this study are official developmental assistance, income group, inflation measured by CPI, polity, GDP per capita growth, and population growth. The results of this study show a negative relationship between foreign aid and income inequality, which is consistent with recent studies on the effectiveness of aid.

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## 1.0 INTRODUCTION

The relationship between foreign aid and income inequality is complicated for several reasons. Foreign aid is given to countries with the intent of providing developmental assistance and positively impacting the country's economy. However, oftentimes the aid given to countries is poorly managed by corrupt political elites and does not ever reach those it intends to help. Contrary to some negative perceptions, several studies have found that aid actually reduces income inequality and is generally used in the way it is intended. However, other studies have found negative effects of foreign aid on economic growth and other economic factors. Because existing research on this issue has shown inconsistent results, we are led to believe that foreign aid may be beneficial in some aspects of an economy and harmful in others.

The purpose of this study is to see if the aid given to countries in Africa actually goes to those it is intended for. While the majority of existing studies focus on data at the world level, this study will focus solely on Africa as it is the region that receives the highest levels of developmental assistance. From a policy perspective, this analysis is important because it will show how the high levels of foreign aid being sent to Africa are being received and utilized. This study will show whether foreign aid is effective in a desirable way, or if it negatively impacts countries in regards to income inequality.

This paper was guided by a single research objective that differs from other studies: to focus solely on the African continent. The ten countries represented in this study are illustrative of the continent as a whole, which will be explained further in the methodology. Nearly every study on the topic of foreign aid and/or income inequality focuses on other regions of the world or on data at a global level. The lack of data availability in Africa drives researchers away from studying the continent, but this paper adds to the existing literature by focusing on Africa alone.

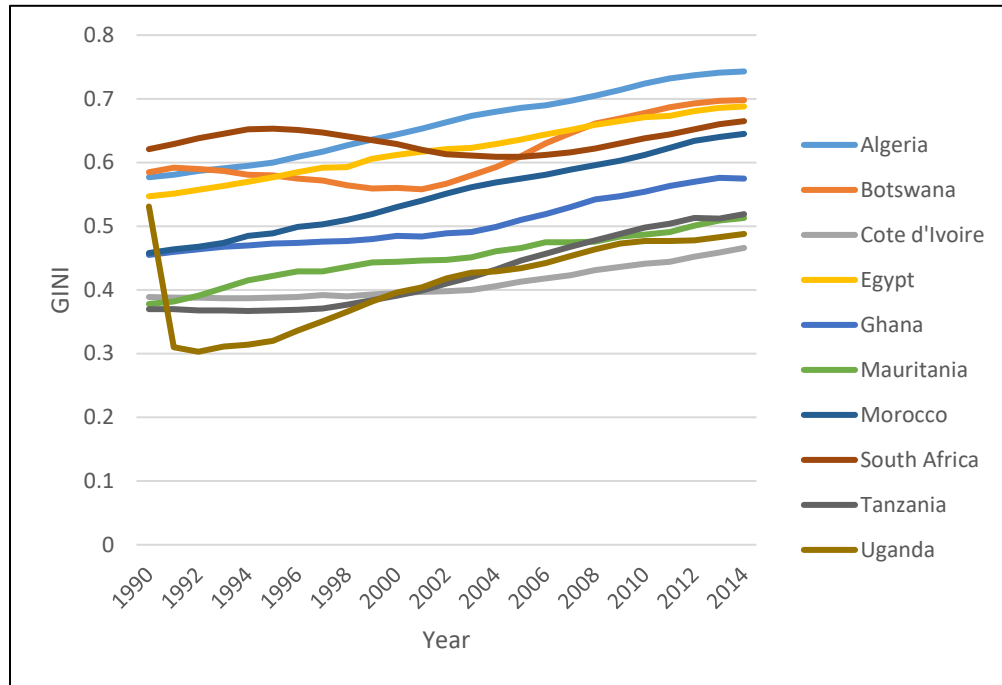
By narrowing down the research to the African continent, this paper is able to analyze the effects of foreign aid on income inequality in a way that has not previously been done.

The rest of the paper is organized as follows: Section 2 illustrates the trends in both income inequality and foreign aid in Africa. Section 3 gives a brief literature review. Data and estimation methodology are discussed in section 4. Section 5 outlines the empirical model. Finally, section 6 presents and discusses the empirical results. This is followed by a conclusion in section 7.

## **2.0 TRENDS IN INEQUALITY AND FOREIGN AID**

Income inequality in Africa is a growing issue, as it has been steadily increasing over the past two decades. All ten countries chosen to study in this research paper show a gradual increase in levels of inequality. This increase, with no sign of slowing down, is a dire issue that needs to be addressed. Reports from New World Wealth show that individuals with assets totaling over \$1 million account for over \$660 billion of wealth holdings. Contrastingly, data from the World Bank shows that individuals living in Africa with under \$1.25 per day increased from 411.3 million in 2010 to 415.8 million in 2011. Therefore we can conclude that there is a solid trend in Africa of an increasing rich population as well as increasing poverty. **Figure 1** illustrates the rise in income inequality that the ten countries in this study have seen.

**Figure 1: Trends in Income Inequality in Africa 1990-2014**

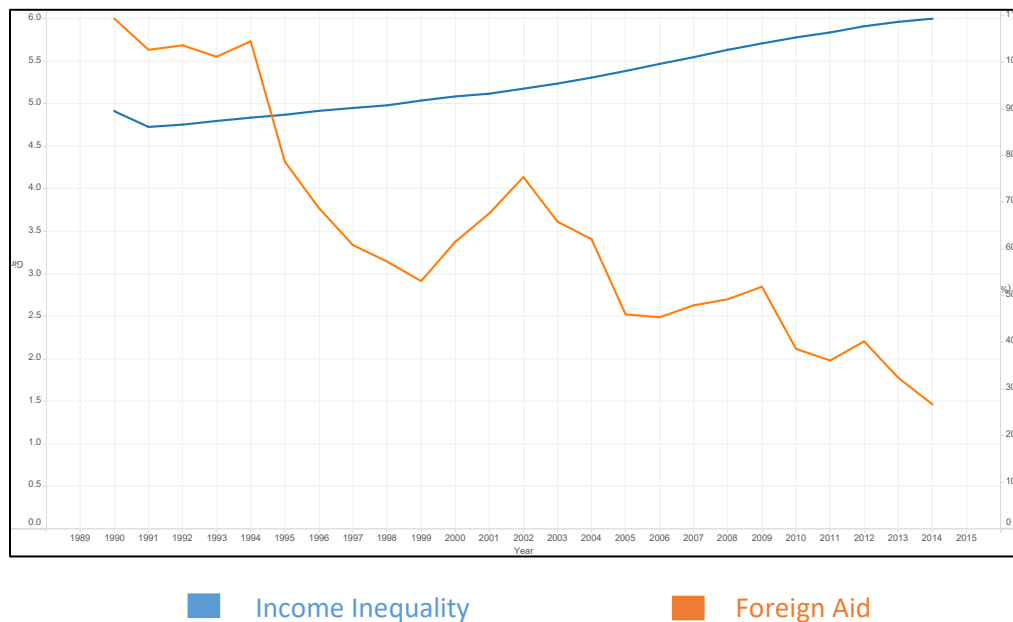


**Source:** World Bank Database

Official developmental assistance, simplified to the term ‘foreign aid’ for the purposes of this paper, has gradually decreased in Africa over the past two decades. The poorest African countries have seen the most decreases, which has sharply worsened poverty in those countries (Drummond). This decline in foreign aid has been met with both praise and criticism. Many believe that foreign aid should be stopped when a country hits middle-income level, but the overall income level of a country does not account for possible inequities within that country. Potential reasons for the decrease in aid to Africa could be the growing unrest in the Middle East using more resources that would have otherwise gone to Africa as well as the overall increase of wealth in many African nations that lead donors to believe their aid is unnecessary or unwanted.

While foreign aid to Africa has been steadily decreasing, income inequality is on the rise, as illustrated in **Figure 2**.

**Figure 2: Trends in Foreign Aid and Income Inequality in Africa 1990-2014**



**Source:** World Bank Database

### **3.0 LITERATURE REVIEW**

Research on the impact of foreign aid and its effectiveness is widespread, and has a variety of conflicting findings. In particular, there is a research gap on study of the effects of foreign aid on income inequality within a country. According to Herzer and Nunnenkamp (2012) anecdotal evidence shows that primarily political elites receive the benefits from foreign aid. Furthermore, they found that foreign aid fuels an unequal income distribution within a country. A possible reason for this, noted by Drazen (2007), is that many agencies face severe incentives to continuously “push money out the door” whether or not it may be going to an effective location. Though aware of this issue, aid givers continue to send funds to African countries where money is often mismanaged or stolen by political elites (Ayodele et al., 2005).

Oftentimes, there are cases when foreign aid has become wasteful, and may promote income inequality if it is distributed ineffectively (Shafiullah, 2011). However, they did find a negative relationship between income inequality and foreign aid, possibly due to better targeting

of aid and growing accountability for both donors and recipients (Shafiullah, 2011).

Underdeveloped countries are frequently given assistance and aid, but do not have the resources to distribute these donations in an effective way (Calderon et al., 2006). This leads to an increase in income inequality as those with the most power are most likely to be recipients of aid.

Conversely, Chong et al. (2009) finds weak evidence that foreign aid leads to an improvement of the distribution of income, but only when the quality of institutions in a country is taken into account.

Several studies have also analyzed the types of countries and populations that are more prone to having unequal income distributions. Koo and Song (2016) suggests that in richer countries, the rich have a higher savings rate which leads to greater income inequality. In democratic countries, economic freedom and education reduce inequality (Islam, 2016). Matotay (2014) also finds that, despite reductions in poverty, inequality is on the rise and is highly correlated with access to education. Jin (2009) finds a negative relationship between inflation and income inequality. Furthermore, the same study found that capital-intensive countries will experience a reduction in income inequality with rising inequality, but the opposite is true for labor-intensive nations.

There is continuous debate on whether foreign aid, typically measured by official development assistance, promotes or hinders economic growth. Asongu (2014) found that development assistance greatly hinders GDP growth, GDP per capita growth, and inequality in Africa. This research shows that foreign aid is not a decent nor a permanent “cure” to poverty in Africa. Calderon et al. (2006) found that when foreign aid first increases from a low to medium level, the Gini coefficient does not change but that when foreign aid is increased from medium to

high, the Gini does increase. Overall, several findings show that aid by itself does not significantly affect income inequality.

## **4.0 DATA AND EMPIRICAL METHODOLOGY**

### **4.1 Data**

The countries chosen for this study were picked based on three factors: income group, geographic location, and – most importantly – data availability. The countries chosen represent low, middle, and upper level income groups in order to get an accurate representation of the variety of countries throughout Africa. The chosen countries are situated throughout the African continent so that one region was not represented more than others. The income level and geographic location of the countries used in this study are meant to be representative of the entire African continent. The most essential factor that led to the utilization of these countries was the availability of data. Studies in Africa are relatively limited due to the missing data values for a large number of countries. These three determining factors resulted in the following 10 countries being chosen for this study: Algeria, Botswana, Cameroon, Cote d'Ivoire, Egypt, Ghana, Mauritania, Tanzania, South Africa, and Uganda. **Table 1** provides summary statistics for all variables used in this study.

**Table 1 Summary Statistics**

<b>Variable</b>	<b>Observation</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>Max</b>
Inequality	250	0.518724	0.006706	0.303	0.743
Foreign Aid	250	6.646242	6.645153	0.069897	30.22169
Income Group	250	2.4	1.115787	1	4
Inflation	250	9.4265	9.09509	-3.20655	59.46155
Polity	250	-0.1	0.342457	-8	9
GDP Per Capita Growth	250	1.580955	3.221649	-10.5353	15.65423
Population Growth	250	2.423983	0.037675	1.191628	3.523579

The panel data analysis method is used in this study to analyze changes in multiple African countries over a period of time. We used data from the years 1990 to 2014 in order to get a full representation of the changes that have occurred in each country over time. The panel data analysis gives us a full understanding of the changes in income inequality over time caused by the independent variables more so than a cross section or time series analysis would be able to provide.

#### **4.2 Empirical Model**

Following Chong et al. (2009), this study adapts and modifies a model to identify the effects of foreign aid on poverty. This study has added the element of income inequality to get a better understanding of the income distribution in African countries.



The model could be written as follows:

$$\begin{aligned} GINI = & \beta_0 + \beta_1 FORAID + \beta_2 INCGROUP + \beta_3 INFLATION \\ & + \beta_4 POLITY + \beta_5 GDP PCG + \beta_6 POPGROWTH + \varepsilon \end{aligned} \quad (1)$$

The Gini coefficient is used as the dependent variable in this study to measure income inequality within a country. The Gini coefficient rates countries on a scale from 0 to 1, 0 being a perfectly equal country in which every receives the exact same income, and 1 being a perfectly unequal country in which one person holds all the income and everyone else has nothing. The Gini coefficient is the most commonly used measurement for income inequality.

Independent variables consist of six variables obtained from various sources. **Appendix A** provides data sources, acronyms and descriptions. First, foreign aid is measured using Official Developmental Assistance as a percentage of Gross National Income. The OECD uses this as a measurement of foreign aid, and therefore the use of it is applicable to the purposes of this study. The second independent variable is income group, measured by the World Bank's classification of countries by income level. The income group levels are low income, lower middle income, middle income, upper middle income, and upper income. By changing these groups to a measurement on a scale of 1 to 5, the income levels by country were able to be added to the data set. The third independent variable is inflation, which was measured using Consumer Price Index. The fourth independent variable is polity<sup>1</sup>, used to measure the level of democracy within a country on a 21-point scale with -10 being a hereditary monarchy and +10 being a consolidated democracy. The fifth independent variable is Gross Domestic Product per capita growth to see

<sup>1</sup> The measurement of polity is based on the competitiveness and openness of elections, the nature of political participation, and the scope of checks and balances placed on executive authority.

how changes in income are felt by individuals within a country. And lastly, the sixth independent variable is population growth to see how changes in the number of people living in a country affects income levels.

## 5.0 EMPIRICAL RESULTS

The empirical estimation results are presented in **Table 2**. The empirical estimation shows the negative relationship between the level of income inequality in a country and the amount of foreign aid received by that country. These findings are consistent with Chong et al. (2009), showing foreign aid to be associated with the improvement of income distribution, as well as other empirical research on aid effectiveness.

**Table 2: Regression Results**

	Inequality
Constant	0.523157*** (0.033)
Foreign Aid	-0.005417*** (0.0008)
Income Group	0.040961*** (0.006)
Inflation	0.000985** (0.0004)
Polity	-0.000440 (0.0008)
GDP Per Capita Growth	-0.034165*** (0.011)
Population Growth	-0.034165*** (0.0101)
R <sup>2</sup>	0.713440
F-statistic	100.8315
Number of obs.	250

Note: \*\*\*, \*\*, and \* denotes significance at the 1%, 5%, and 10% respectively. Standard errors are in parentheses.

The income group variable estimate was significant at the 1% level. The parameter estimate of income group is consistent with Koo and Song (2016) and Nasreddine and Mensi (2016). The income group variable estimate was the strongest of all that were included in this study. The estimate indicates that income group is positively associated with income inequality in Africa. The positive relationship between income group and inequality indicates that as a country becomes richer, there is a greater likelihood of inequality within that country. A low income country does not have the initial capital required to sustain income inequality, therefore a higher income country has a greater chance of being unequal. Thus, it is no surprise that the high proportion of low income countries in Africa relative to the rest of the world has led to high levels of inequality in that region.

The inflation variable estimate was positively associated with income inequality and significant at a 5% level. This finding is not consistent with findings from Jin (2009) which show a negative relationship between inequality and inflation. However, when analyzing developing countries only, Narob (2015) discovered inflation to be positively associated with inequality. These disparities prove that inequality is impacted differently depending on the development of the country. This relationship is believed to be caused by the inability of a low income population to keep up with rising prices caused by inflation.

The polity variable estimate was found to not be statistically significant. The negative relationship, however, is still consistent with Desai et al. (2003) and Bourguignon and Verdier (2000). The parameter estimate was the only to not be statistically significant in this study. Population growth is significantly negatively correlated with income inequality. This is due to increasing populations creating a larger work force and enabling the lower income population to increase their share of wealth. This estimate is consistent with Hansen, H., & Tarp, F. (2001).

Lastly, GDP per capita growth is positively correlated with income inequality at a significance level of 1%. This relationship is due to the fact that GDP per capita is calculated by dividing the GDP of a country by its population which doesn't account for possible inequities in the distribution of income.

These findings are consistent with research from Chong et al. (2009) as well as Shafiullah (2011). It has been shown that foreign aid leads to a reduction in income inequality and an improvement in income distribution. These results lead to implications for official developmental assistance policies and their effects on inequality in Africa.

## **6.0 LIMITATIONS AND POLICY RECOMMENDATIONS**

### **6.1 Limitations**

The biggest limitation in this study is the lack of availability of data. In order to complete this research paper, all of the chosen countries had to have inequality data available. This resulted in a skewed number of middle and high income, democratic countries being used in this study, which is not representative of the African continent as a whole. Many of the countries chosen were former colonies of the French and British, and therefore it is possible the foreign aid data received by those countries is not an accurate representation of Africa either.

### **6.2 Policy Recommendations**

This study finds a negative correlation between income inequality and foreign aid, meaning that higher levels of foreign aid should, in fact, reduce inequality within a country. Based on these results, our policy recommendation is therefore to increase official developmental assistance to low income African countries. The low income countries in this study had the highest negative correlations between income inequality and foreign aid.

Increasing aids to these countries is expected to reduce the likelihood of unequal income distribution in Africa.

## **7.0 CONCLUSION**

In summary, official developmental assistance, measured as a percentage of GNI, has a negative relationship with income inequality. The significance of this finding is that higher levels of foreign aid will be associated with lower levels of income inequality. Currently, foreign aid has been declining in Africa while income inequality has seen steady growth, which is consistent with our findings. The results of this paper imply that an increase in developmental assistance to Africa will lead to a reduction in income inequality. Further analysis on this topic should focus on the African continent as a whole in order to gain a better understanding of how foreign aid is received by all African countries.

### Appendix A: Variable Description and Data Source

<b>Acronym</b>	<b>Description</b>	<b>Data source</b>
GINI	Income inequality measured on a scale of 0 to 1, 0 being a perfectly equal country and 1 being a perfectly unequal country	National Bureau of Economic Research
FORAID	Official Development Assistance as a percentage of Gross National Income	World Bank Database
INFLATION	Consumer Price Index	World Bank Database
INCGROUP	Income group ranging from 1 (low income) to 5 (upper income)	World Bank Database
POLITY	Measurement of the level of democracy on a 21-point scale	Systemic Peace
GDP PCG	Percent change in Gross Domestic Product per capita	World Bank Database
POPGROWTH	Percent change in population level	World Bank Database

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