

## The Impact of Foreign aid and Co2 Emission on Economic Growth: Evidence from Ethiopia

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### Abstract

Foreign aid entails provision of funds or resources or technical assistance by one country to another. The purpose is normally informed by the growth of the recipient nation, mitigation of disasters and assistance with social issues. It may be applied in a multifunctional manner: donations, subsidies, gifts and in-kind for purchases made through grants, loans or donations of goods and services. Generally, it is intended to help countries in distress owing to poverty, calamities, destructions, devastations or war. Therefore, the aim of the current study is to analyse the effect of foreign aid, carbon dioxide emissions and other related economic indicators on Ethiopia. Both annual and other period data were obtained from the WDI, IMF, Ethiopian Ministry of Finance and Economic Development, MoPADBE, DBE, NBE, and MoF. Foreign aid, CO<sub>2</sub> emissions, and macroeconomic variables were regressed on economic growth in this study. The research data was analyzed using descriptive statistics and E-View version 9 software. The human capital variable has a positive coefficient positive effect. The government has to decrease carbon dioxide emission and donate the development aid to every field according to the provision of law.



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Carbon Dioxide Emissions;  
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### Introduction


Foreign aid is also defined as the official assistance known as development cooperation or development finance, which is aid provided from one country to another in form of funds, goods or technology which is given for motives which are permanently of a development nature or with the primary aim of achieving diplomatic relations. It comes in form

of cash transfers, or in-kind transfers which is provision of products and services and is normally offered to the desire countries due to pull factors such as poverty, disaster or conflict. Official development assistance has been considered critical to the development particularly in the recipient countries. Thus most of the underdeveloped nations have their subsidies from the developed nations since

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the 1960s than benefiting more from the other beneficiary region. For SSA, LA, and Caribbean, and Asia. However, the rate which was achieved was below the other beneficiary regions with growth rate realized in sub-Saharan African countries. In later years, it has become almost impossible to resolve problems related to economics and statistics without aid of progressing towards the objective of economic growth at the national level. In the empirical work done by 6, the official development assistance had the same advantage regarding the overall national economic consequence of developing nations. Having considered humanitarian aid, economic development, and political stability, the visits of<sup>7</sup> proved that official development cooperation is required to address the issues of the world and unemployment ultimately. According to scholars known as,<sup>2</sup> official development assistance usually supports one of three things: concerned with general development, or assistance, or promoting diplomacy." Granting can also assume different guises such as grants, loans and donating goods and services. Most of the time it is intended to help countries that could be in a worse off situation due to factors like poverty, disaster or conflict. Foreign aid influence has thus remained one of the most talked about issues in relation to the Ethiopian economy. For instance, when discussing the analysis of the sequence including<sup>1-4</sup> dispose the ODA positively towards the increase in the size of the economy; enhancement of human capital investment; encouragement of investment; infrastructure development; accomplishment of stability of the economy. Other researchers<sup>1,6</sup> have ensured this, though, that foreign aid is also injurious to economic growth in that it makes the Malagasy nation parasitic, corrupt, distorting the market and the incentive structure. Out of many variables of macro-environment, one of the highest impact variables is carbon di oxide which is actually throttling economic progress. This study showed that actions trumped by carbon dioxide contributed to climate change reduce the worth of climate change, increase health costs, deplete resources and increase investment and insurance costs, decrease productivity and increase the costs policies and regulations. Of all the simpler factors, the economic growth, in most cases, depends on various macroeconomic factors. Foreign aid is one of the peculiar State concerns that researchers constitute as one of primary interests with respect to determining factors of economic

growth. As the researchers on the role of SAID in cross-section growth indicate, this is the first that undertaken an analysis of the foreign aid and development.<sup>2</sup> The exchange is beneficial to countries that require large amount of foreign exchange flows to fatten the national production. Importance of foreign investment and opportunities as prerequisites to the economic development is rather high.<sup>3</sup> We can say that factors such as weak institutions and corruption also reduce the positive effects of foreign aid<sup>4</sup> Sub-Saharan Africa receives international aid from around the world, but its human development levels and GDP per capita remain among the poorest countries in the world.<sup>5</sup> As a consequence, most sub-Saharan countries fell victim to underdevelopment economically and into debt traps gradually, despite huge development assistance.<sup>8</sup>

Targeted assistance and its significant contribution to economic development,<sup>5</sup> Thus, the estimates suggest that development aid exerts a positive impact on economic growth with some threshold effect on the economy. Although there has been extensive literature on the subject still, there is no consensus about the effects of foreign aid on growth, and results are yet inconclusive.<sup>9</sup> To explain,<sup>9</sup> confirmed that foreign aid has neither positively nor negatively correlated with economic growth.

## **Materials & Method**

### **Information Sources**

Information was collected from NBE, CSA, MoFED, EEA, International IMF Database, and World Development Index.

### **Data Types and Sources**

The trends in this research were performed according to time records for the given years. All sources are collected from the journal of BE, CSA, Moved, EEA, and IMF Archives as well as World Development and other journals where necessary.

### **Analysis of Data**

For the purpose of analysis the quantitative data collected for the macro variables was analyzed using descriptive statistics and econometric techniques. This paper examines the relationship between ODA, CO<sub>2</sub> emissions, and the economic growth of the country Ethiopia over the period of analysis.

**Table 1: Augmented Dickey Fuller At level**

Variables	Equation				Decision
	statistic Intercept	5% level of significance	Test statistic Intercept & Tend	Critical 5% level of significance	
LNRGDP	2.788966	-2.933158	-1.783947	-3.520787	Accept the null
Co2 Emission	-4.043192	-2.933158	-4.894503	-3.520787	Reject the null
LNRGDP rate	0.089141	-2.935001	-3.162383	-3.523623	Accept the null
LNODA	-1.027979	-2.933158	-2.013711	-3.523623	Accept the null

**Table 2: Augmented Dickey Fuller (ADF) Test (At 1st difference)**

Variables	Test Equation				Decision
	Test statistic Intercept	Critical values at 5% level of significance	Test statistic Intercept & Tend	Critical value at 5% level of significance	
LNRGDP	-4.690862	-2.935001	-5.608675	-3.523623	Reject the null
Co2 Emission	0.0000	0.0000	0.0000	0.0000	
LNRGDP rate	4.051389	-2.935001	-4.092932	-3.523623	Reject the null
LNODA	-4.878061	-2.936942	-5.052576	-3.526609	Reject the null

Source: Author's Estimation using E-views 9.0.

**Table 3: Unit root test of the residual**

Series	ADF test				Decision
	At level				
	Intercept	5% level of significance	Test statistic Intercept & Tend	level of significance	
ECM	-4.324732	-2.935001	-4.265026	-3.523623	Reject the null

**Results and Discussion**

The estimated French ADF units in Table 3 show that other than CO2 emissions, LNRGDP, LNO DA, NPR EM, and LN GDPR have reference values when effects at the level de parity of 5% of intercept and variance are taken into consideration in the equation. These abridgments namely LNRGDP, LNO DA, NPR EM, and LN GDPR have no base. Thus, when the effect and variance are entered into the test equation, the CO2 emissions remain

unchanged, while a slight increase is observed at the 5 percent significance level (44195.35 degrees). Excluding the CO2 synthesis, all the t-tests are statistically significant at 5 percent level. Obviously, as can be seen from the evaluation results, after the first difference, the null hypothesis is that there is actually a system root in the country has been rejected. However, at least, this is possible to estimate the long-terms equilibrium. Furthermore, the ADF robustness test for 5 residuals shows that

the residuals are stationary at that point in the values. Backed this like  $I(0)$ , meaning there is an equilibrium level relationship between explanation and variation. When one has chosen the fundamental analysis and long-term view, it is time to check whether there is a co-integrated movement between real GDP, foreign aid, etc. Since all the variables in this study are not integrated in the same order,  $I(1)$  and  $I(0)$  cannot carry out the normal integration from 9 since they should be integrated in order of (1). Therefore, this

study chose a lagged crossovers test with the aim of determining whether the variables reverts back to the means and consequently testing their long run equilibrium. The current paper presents Table 7 for combined analysis of the results. That is, if  $F > I(1)$ , then the null hypothesis has to be rejected while when  $F < I(0)$ , then the null hypothesis is also rejected. Again, it is declared at the 5% limit, and this should result to acceptance of the null hypothesis.

**Table 4: Bounds Test for Cointegration**

Test Statistics	Values	k	Significance Level	I(0)	I(1)
F-statistic	3.601786	10	10%	1.83	2.94
			5%	2.06	3.24
			2.5%	2.28	3.5
			1%	2.54	3.86

Source: Source: Author's Estimation, 2024

The null hypothesis of  $I(1)$  is tested by the F-statistic lower bound from  $2.74 < F\text{-statistic} < 3.24$ , with the observed F-statistic of 3.601786 in excess of the upper bound of 3.24 for  $I(1)$  at the 5% level of significance. Further down, the usage of the ARDL bounds test has not supported any co-integration value of the variables in the underestimation model of the analysis. In this regard, this study offers demographic support to the assertion that variables

are co-integrated, providing evidence of a long-run equilibrium relationship.

#### Long-run ARDL Model Estimation

As the next step in the confirmatory analysis of the existence of a long-run relationship, the research will estimate the ARDL model with an aim of assessing the long-run coefficients as expressed in Table 8 below.

**Table 5: Long-Run ARDL Estimation Result**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDp rate	0.021186	0.009241	2.292644	0.0426
Co2 emission	-0.829512	0.336076	-2.468223	0.0312
LNODA	-0.035031	0.220314	-0.159004	0.8765

According to the findings of the present work emphasizing on the long run view of the study, it is noted that real GDP is somehow crucial and acts as a promoter to the overall Ethiopian economic advancement. Again, human capital implies one percent rise in real GDP growth rate to contribute 0.02 percent in economic growth. According to the above findings on the mentioned variables in this

paper, the relationship is acceptable for a developing country like Ethiopia. When the economy is not in a state at all, that is to say jobs or idle capacities exist, GDP growth in theory contributes to the increase in production. In addition, increased real GDP growth leads to consumer expenditure for high prices which aim to attain higher wages and growth in an economy. Concerning these two

variables, the above discovery was supported by John Maynard Keynes who in his theoretical findings affirmed a direct proportional relationship between the two macroeconomic variables. Empirical studies 4 support this result According to the present findings; the study has a number of theoretical implications that must be addressed at this stage. The emissions of carbon dioxide pose long-run dangerous economic growth for Ethiopia. This is far from the preliminary expectation of a positive sign". The problem is that most CO2 emissions cannot be directed into activities that drive growth. Looking at the long-run multiplier, they show that there is a loss of 0.83 percentage points of Ethiopia's economic growth if carbon dioxide emissions increases by one percentage point. As a result, the self-direction of the foreign aid has negated the economic growth of Ethiopia in the long-run. This sign is very far from expectation which leads to the fact that the somewhat increased DOA does not have profound impact on the level of economic development of

Ethiopia. On the other hand, the above difference in the results arrived at 5% significance level hence suggesting that there really exists a difference between the two group being referenced. Of course, foreign aids develop dependence to the recipient country, annihilate local endeavors and spirit of innovation, and, therefore, have influence on personal involvement in the future.

**Fixation Model for the Short Run**

Subsequently, we obtain the short-run error correction model when the long-run coefficients are estimated. The error correction term is a disequilibrium correction that is carried out expeditiously in a dynamic framework. The coefficient of the error correction period indicates how quickly the disequilibrium deviation returns back to equilibrium. These are the residuals obtained by the estimated long-run model where each point is lagged with the previous point. We expect a negative sign, and they should be huge.

**Table 6 Shor-run model estimation**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DRGDP rate	0.000259	0.000525	0.492969	0.6317
D(co2emission(-1))	-0.002351	0.000518	-4.540229	0.0008
D(ODA)	0.023439	0.078872	0.297179	0.7719
CointEq(-1)	-0.170027	0.070242	-2.420579	0.0340

Source: Author's Estimation, 2024

The different variations that can be identified in the variable are adjusted with respect to the speed of correction by using the error correction model. The error correction term  $ECT_{t-1}$  means the speed of recovery adjustment in the dynamic mode is negative and not statistically significant at the 5% level, which also proves the long run, which can satisfy the equation. Our  $ECT_{t-1}$  coefficient is 0.17, and this means that in the short-run estimate, 17 percent of the length of the complaints that this model indicates will be resolved in a year. Many of the overall results were however negative. The current research also shows that in the short run, economic activity reduces by 0.002% for each 1% of carbon dioxide emissions. This finding is in accord with the hypothesized expectation prior to the research study. This was in concordance with the empirical

result of 1. The two effects are anticipated and can therefore be explained in the following manner. The effect of CO<sub>2</sub> emissions, nevertheless, is negative for production in the short run. It therefore means that the carbon dioxide emissions may fluctuate a lot over the short term due to such factors as. Nevertheless, what is generated by CO<sub>2</sub> is an awful effect on the soiled, and in this case, it results in low yields on the soils. For instance, internal unrest and wars, raise of carbon dioxides emissions because of COVID-19 pandemic, and violence across the country made decline in prices in the national economy. The growth of the economy of Ethiopia has been very impressive and very much lucrative. Another previous study indicated that if general development services were to rise by 1%, then the economic growth rate would

improve by 2.3%. This means that an adoption of the full developmental general and developmental pluralistic package services and solutions would have a beneficial effect on the process of economic growth while positing and stimulating only posit growth selectively. 9 Theology and religious sciences back this finding. The normality test, correlation coefficient, the heteroscedasticity test of the estimated ARDL model were also conducted in the study. The study also ran tests like normality test,

correlation coefficient and heteroscedasticity test of the estimated ARDL model. The result of each test is depicted below.

#### Serial Correlation Test

The assumptions of this test are;

Ho: no serial correlation

H1: auto correlated residual

The results are presented below as follows,

**Table 7 : Breusch-Godfrey Serial Correlation LM Test**

F-statistic	6.130694	Prob. F(2,9)	0.0209
Obs*R-squared	23.64460	Prob. Chi-Square(2)	0.0000

Source: Author's Estimation using Eviews 9.0.

Therefore, we proceed to not reject the null hypotheses since both the \*R-squared and F statistics are less than 0.05, thereby implying the 'autocorrelation'. For this reason we have chosen to retain the Ho model which has it that there is no autocorrelation F-statistic = 0.395529 probability (F-statistic) = 0.973. Thus, the results indicate that the residuals which were observed earlier are actually independent of each other.

#### Conclusion

This is true in general for development aid and Ethiopia in specific, which, albeit in overall demeaning impact on the country's long-run ED, just in the short-run ED you sometimes get a helping hand. Furthermore, this has an especially negative effect on the long run of economic growth and development in relation to the DA context for Ethiopia. However, the mean result also indicated the negative result of the study that there is a negative relationship between economic condition and long-run economic growth of the country, Ethiopia. Besides this, the study also found negative population growth to have an economic contraction impact on the Ethiopian economic growth in the short run and long run. Specifically from Granger causality, it is revealed that only carbon dioxide emission is Granger caused by economic growth within this Granger sense while the change from economics to population development as well as economics. The analysis of impacts of Growth on Carbon Dioxide Emission and Vice Versa has been made through Granger causality test specification. The negative sign of the error correction period

show that adjustment from the short-run individual variable to the long-run equivalent of the change of a variable. From the result the error correction coefficient is negative namely -0.17 hence the implies that equivalent duration annually declined by about 17 percent. This shall also support our argumentative assertion that mentioned variables are correlated in the long run. This is high because there is high interest expressing a preference for the service and at the same time, contaminating it. In light of the above findings, the observation whereby, is in support of the contention that foreign aid has a negative trend with economic growth in Ethiopia in the short run. Though conversion to renewable energy sources would be even more advantageous, quite a number of sectors have started voicing their stand towards the conversion. But only then could good economic growth be achieved if only the countries could sustain their investments on the downward trend of carbon dioxide emissions and on investment in human capital formation through education and training. It has become very important that now more than ever, these checks and balance systems with verification procedures for review ensure that the benefits get to the beneficiary or that the individual does not even qualify for any benefits, yet the individual is able to easily access legitimate services from the government without restrictions.

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#### Conflict of Interest

The author(s) do not have any conflict of interest.

#### Data Availability Statement

The manuscript incorporates all datasets produced or examined throughout this research study.

#### Ethics Statement

This research did not involve human participants, animal subjects, or any material that requires ethical approval.

#### Informed Consent Statement

This study did not involve human participants, and therefore, informed consent was not required.

#### Author Contributions

- **Mohammed Essa:** Conceptualization, Methodology, Writing – Original Draft, Data Collection, Analysis, Writing – Review & Editing.
- **Dr. Parmod Kumar Aggarwal:** Resources, Supervision.

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