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The impact of foreign aid on economic growth: Empirical evidence from Ethiopia

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PUNJABI University
November, 2023

Outlines of the Presentation

- **INTRODUCTION**
- **Statement of the problem**
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INTRODUCTION

- Developing countries are characterized by resource starved economies, specifically capital-related. Capital to boost economic growth and welfare is largely inadequate domestically, which consequently warrants the need for external capital.
- The only external capital readily available to support development undertakings have to come from foreign aid. It began in the late 1940‘s with the purpose of reconstructing the war-torn economy of Western Europe.
- African economies have received large inflow of foreign aid after 1950s. In Ethiopia during the three five year plan period (1957-1973), 25 percent of the required total investment was covered by external public capital.

- Similarly, during the post revolution period, 37 percent of the total annual campaign of 1979-83 was financed by foreign aid (Tolessa 2001).

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- Besides, foreign aid covered 23.2% of total revenue in 2010/11 fiscal year (National Bank of Ethiopia annual report, 2010/11).This shows that foreign aid has been playing the great role in Ethiopia's economy since 1950s.
- There is significant increase in foreign inflows, but the economic growth achieved by many Sub Saharan African countries has not been satisfactory.
- Thus, the actual role of foreign capital inflow has been an area of controversy.
- Ethiopia has been one of the major recipients of international aid.
- It is evident that despite notable donor intervention in the country's economy, less economic growth and poverty remain inherent for many years.

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- Despite this paradoxical scenario, there are few researches capturing the attention of assessing the effectiveness of aid in such a country in order to find out whether aid has been effective, or whether, in fact, the persistent poverty in such an aid-dependent country is not the result of the ineffectiveness of aid.
- So far done studies are controversial. The study by Abeba S (2002) shows that aid has negative impact on economic growth of Ethiopia while the study by Tasew T (2010) and Yohannes (2011) found that aid has positive impact on economic growth of Ethiopia. The current study used new methodology with latest and detailed data to examine the impact of foreign aid on

economic growth of Ethiopia (i.e. ARDL).

Objectives of the study

- The general objective of the study is to investigate the impact of foreign aid on economic growth in Ethiopia from 1974 to 2011 using ARDL approach.

Specific Objectives

- To determine the impact of foreign aid on economic growth.
- To find out whether the impact of foreign aid on economic growth of Ethiopia depends on macroeconomic policy environment or not.

Scope of the study

- The study used time series data from 1974-2011 for Ethiopia.
- This is because; several country-specific factors may induce apparent differences in the effect of aid on growth, but these factors cannot be fully controlled for in cross-country regressions (especially if effectively unobservable); the classical omitted variables problem.
- Panel estimation can account for unobserved country specific effects, but the homogeneous panel estimators used in the aid literature produce inconsistent and potentially misleading estimates of the average values of the parameters in dynamic models when the slope coefficients differ across cross-section units (e.g., Pesaran and Smith, 1995).
- Cross-country analysis is an approach in which each country is treated as sample point assuming that the impact of foreign inflow is constant across countries that is the same in all LDCs.

- However, the role of external assistance differs greatly from country to country. Furthermore, cross-country analysis assumes that countries are homogenous in terms of economic structure and policy reactions.
- However, these countries differ significantly on domestic policy measures,

economic, political, cultural and social structures.

- Thus, it is obviously difficult to conclude and recommend policy based on the cross-country .That is, these factors affect

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- The impact of foreign aid differently in different countries. Thus, the study area is limited to single country, Ethiopia. The selection of the series dependence on the availability of data required for the study.

Significance of the study

- In Ethiopia, the number of studies conducted so far on the impact of foreign aid on economic growth is limited in number, in which further study is required.

- Therefore this study will help in filling knowledge gap in such area.

- As commonly known aid is a back bone of the Ethiopian economy, therefore the expected outcome from this study could also be useful in improving policy design, institutional setup, implementation, monitoring and evaluation of foreign aid. Besides, it can evoke further study in the area.

METHODOLOGY

Data Sources and methodology

- The necessary data for the paper is collected from various sources such as Ethiopian Economic association(EEA) data base CD Rom 2012, Ministry of finance and Economic Development (MOFED), National Bank of Ethiopia (NBE), Ethiopian Central Statistical Authority (CSA), National Metrology Agency, International Monetary Fund (IMF) database, Penn World Table and World Bank online Data bases.
- The method employed in the study is based on recent advancements in the theoretical and empirical aid growth relationships.
- As the data used is time series, various tests such as testing for stationary (unit root test) and co-integration test are performed.

- The rank of co-integration is determined by using ARDL. The model is estimated by using Ordinary least Square (OLS).

3.3. Methods of Data Analysis

In order to arrive at the intended objectives, this study used secondary time-series data analysis for about 20 years. The selection of this sample size is made given the availability of data for each of the variable included in the model for the entire time horizon. Furthermore, in examining the effect of external debt on economics growth the vector error correction model was used.

3.2 Model Specification

In this study the impact of foreign aid on economic growth in Ethiopia is analyzed based on the standard growth accounting model. In order to examine the nexus between foreign aid, Foreign direct investment, human capital, energy consumption, co2 emission, corruption index, inflation rate and economic growth in Ethiopia ARDL & ECM models were used. The model shows that the influences of Official development AID in economic growth of Ethiopia with other selected macroeconomic variables both In short & long run. The second model shows that the influences of RGDP and other macroeconomic variables on *AID* inflows. Therefore, based on this theoretical framework developed by Markiw, Romer and weil(1992) the following two empirically estimative model (with some modification to accommodate other additional variables) is specified; $Modell$: $lagRGDPt$ = (FAID, Co2, EU, INF, Human Capital, corruption index, FDI, inflation) …

3.3 Autoregressive Distributed Lag (ARDL) Model

In this research, the study will use Autoregressive Distributed Lag (ARDL) model to examine the influences of external aid in economic growth of Ethiopia, and also examine the influences of RGDP and other macroeconomic variables on Aid inflows. The autoregressive distributed lag (ARDL) model deals with single co-integration and is introduced originally by

Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). The ARDL approach has the advantage that it does not require all variables to be I (1) as the Johansen framework and it is still applicable if we have I (0) and I (1) variables in our set. The ARDL has been chosen since it can be applied for a small sample size. Also, it can estimate the short and long-run dynamic relationships in external AID and economic growth. The ARDL methodology is relieved of the burden of establishing the order of integration amongst the variables. Furthermore, it can distinguish dependent and explanatory variables, and allows testing for the existence of relationship between the variables. Finally, with the ARDL it is possible that different variables have differing optimal number of lags. ARDL are standard least squares regressions that include lags of both the dependent variable and explanatory variables as regressors (Greene, 2008). ARDL models are linear time series models in which both the dependent and independent variables are not only contemporaneously, but across historical (lagged) values as well. In particular, if is dependent variable and are k explanatory variable, a general ARDL (P, q1,

q2….qk) model is given as:

$$Yt = \gamma 0i + pi=1\ \Theta iYi-t + qi=0\ \beta jXt-i + \epsilon it \ldots\ \ldots\ \ldots\ \ldots\ \ldots 1$$

In this paper, I was employed Autoregressive Distributed Lag (ARDL) model to examine the influences of official development assistances inflows and other macroeconomic variables on RGDP growth. The autoregressive distributed lag (ARDL) model deals with single co-integration and is introduced originally by Pesaran and Shin (1999) and further extended by Pesaranet al. (2001). The ARDL approach has the advantage that it does not require all variables to be I (1) as the Johansen framework and it is still applicable if we have I (0) and I (1) variables in our set. The ARDL has been chosen since it can be applied for a small sample size as it happens in this study. Also, it can estimate the short and long-run dynamic relationships in foreign aid and economic growth. The ARDL methodology is relieved of the burden of establishing the order of integration amongst the variables. Furthermore, it can distinguish dependent and explanatory variables, and allows testing for the existence of relationship between the variables. Finally, with the ARDL it is possible that different variables have differing optimal number of lags. ARDL are standard least squares regressions that include lags of both the dependent variable and

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- In particular, if is dependent variable and are k explanatory variable, a general ARDL (P, q1, q2….qk) model is give as;
- ∑ ∑ Where is a vector and variables in ( )‘ are allowed to be purely I(0) or I(1) or co-integrated; θ and β are coefficient is the constant; i=1,2…,k: p, q are optimal lag orders; is a vector of the error terms un observable zero mean white noise vector process(serially uncorrelated or independent).
- The model is autoregressive‖ in the sense that is explained‖ (in part) by lagged values of itself. It also has a distributed lag‖ component, in the form of successive lags of the X‖ explanatory variable.
- Sometimes, the current value of itself is excluded from the distributed lag part of the model‘s structure.
- To know the existence of long-run and short-run dynamic between Official

Development Assistances and economic growth models were used.

3.4 Error-Correction Models

- The study explores the issues surrounding the analysis of co-integration and the Error Correction model within the Distributed Lag model framework; i.e. the Autoregressive Distributed Lag Approach to co integration.
- The Error Correction Model (ECM) can be derived from ARDL model through a simple linear transformation, which integrates short run adjustments with long run equilibrium without losing long run information.
- If there is an evidence of long-run relationships (co-integration) between the variables from ARDL bounds test based on model one and model Two, the general Error-Correction Models (ECM) can be specified as below:
- $\Delta Yt = \delta i + \Theta 1ipi=1\ \Delta Yt-1 + \beta 1jqj=1\ \Delta Xt-j + \lambda iECMt-1 + \epsilon it \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (20)
- Where$ECMt-1$ is the error correction term extracted residuals from the regression of the long run equation based on the representation theorem (Engle and Granger, 1987), and where Yt and Xt are the vector of the variables included in the model
- (lnRGDP, F(variales)t. and $\delta i$is the vector of constant terms, $\beta 1j$and$\Theta 1i$are the matrices which

include the interaction coefficients of the variables involved in equation ,$\lambda i$is the vector of coefficients for each of the error correction terms and $\epsilon it$is the vector of disturbance terms.

Table1. The Results of F-Test for Co-integration(Result & Discussion

Dependent Variables	F- values	Decision
D(LnRGDPt)	7.78***	Co-integration
D(lnLF)	2.73	No co-integration
D(LnA)	2.32	No co-integration
D(Ln(M2/RGDP))	2.19	No co-integration
D(LnPINV)	1.39	No co-integration
D(lnH)	2.599	No co-integration
D(LnA*LnPINDEX)	2.19	No co-integration
D(LnMEANR)	1.14	No co-integration
Lower bound	Upper bound	
The critical values		
1.70	2.83 at 90%,	
1.97	3.18 at 95%,	

2.54 3.91 at 99%

The assumption of only one co-integrating vector is fulfilled that is only D(LnRGDP) is endogenous variable

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- **Table2**. Estimated long run coefficients using the ARDL approach ARDL(1,0,0,0,0,0,0,1) selected based on Akaike information criterion: dependent variable Ln(RGDP).

Variable	Coefficients	t-ratio	Probability
LnPINV	0.075474	1.5206	0.140
lnLF	-1.6017	-3.1581	0.004
LnA	-0.65813	-3.2272	0.003
LnMEANR	0.57904	1.7894	0.084
Ln(M2/RGDP)	0.15630	2.7716	0.010
lnH	2.7246	5.9616	0.000
LnA*LnPINDEX	0.20526	3.5549	0.001

Note: *=significant at 10%, **=significant at 5 % and *** significant at1%

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- Where λ is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated cointegration model of equation (9).
- The study is based on the annual time series data from 1974 to 2011.
- The total number of observation is 38.

  Data analysis was performed by Eviews 5 and micro fit 5. Before proceeding with the ARDL bounds test, the unit root test was done. This is to ensure that the variables are not I(2) stationary so as to avoid spurious results because the bounds test is based on the assumption that the variables are I(0) or I(1).Only mean annual rain fall was found stationary at level, while other variables are stationary after first difference.
- ARDL co-integration test, assumed that only one long run relationship exists between the dependent variable and the exogenous variables (Pesaran S. and Smith, 2001, assumption 3).To test whether this is really appropriate in the current application, the entire variables were changed to dependent variable in order to compute the F-statistic for the respective joint significance in the ARDL models (Narayan P, 2004). Since AIC tends to have practical performance advantages over

BIC (Burnham KP and Anderson DR. 2002; 2004) the lag length is selected by AIC (table1).

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Long run and Short run Coefficients

Once co-integration is established, the conditional ARDL long-run model for Ln(RGDP) can be estimated and the result is presented in table 2.

Foreign aid taken separately has negative impact on RGDP, One percent change of foreign aid-RGDP ratio results in -0.658% in RGDP change. Javid M and Qayyum A (2011) mentioned that Donor's conditionality, poor governance, tied aid, kickbacks paid to the foreigner contractor and weak state institution might be the causes of failure of contribution of foreign aid in development process of the economy. Easterly and Pfutze (2008) as

Table3. Estimated coefficient of short run dynamics (error correction) ARDL(1,0,0,0,0,0,0,1) selected based on Akaike Information Criterion, dependent variable is D(RGDP)

Variables	Coefficients	t-statistics	Probability
D(LnPINV)	0.032377	1.5740	0.126
D(LnLF)	-0.68712	-2.8868	0.007
D(LnA)	-0.28233	3.3459	0.002
D(LnMEANR)	0.089	0.72749	0.473
D(LnH)	1.1688	3.4554	0.002
D(LnA*LnPINDEX)	0.088054	3.4035	0.002
D(M2/RGDP)	0.067051	2.7999	0.009

ecm(-1) -0.42898 -4.1476 0.000

R-squared=0.53,F(7,29)=4.7533(0.001),Durbin Watson stat=1.9627

Note:*=significant at 10%, **=significant at 5 % and *** significant at1%

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Tests	Short run		Long run	
	statistics	Probability	statistics	Probability
Breush-Godfrey serial Correlation LM	3.211	0.2007	4.66	0.097
White Heteroskedasticity test	23.54	0.26	20.87	0.28
Jarque Bera Normality Test	1.35	0.507	0.033	0.98
Ramsey Reset Log Likely hood Ratio	0.51	0.47	3.063	0.0918

These might also be true in Ethiopia (table3).

- The coefficient on the lagged error-correction term is highly significant at one percent level of significance with the expected sign, which confirms the result of the bounds test for co-integration.
- Its value is estimated to -0.429 which implies that approximately 0.429% of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year.
- Foreign aid and RGDP have negative relationship; the one percentage change in percentage of foreign aid – RGDP ratio causes RGDP to be changed by 0.282%,
- other variables remaining constant. When aid is interacted with policy index it has

got positive coefficient and highly significant. This shows aid is effective when supplemented with good macro policy environment. This positive result is similar to that of Yohannes B (2011) in Ethiopia.

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- The Long run equation is: RGDP= 0.075474*LnPINV - 1.6017*LnLF - 0.65813*LnA (0.0496) (0.5071) (0.2393) + 2.7246*LnH + 0.20526*(LnA*lnPINDEX) (0.4570) (0.057) +0.156 30*Ln (M2/RGDP) + 0.57904*LnMEANR + ecm (0.0564) (0.3236) (0.1034)

  Figures in parentheses are standard error

  As can be seen from table 4 both long run and short run model pass all the diagnostic tests against serial correlation Breusch-Godfrey test, heteroscedasticity (White Heteroskedasticity Test), and normality of errors (Jarque-Bera test). The Ramsey RESET test also suggests that the model is well specified.

Stability Test

- The stability of the long-run coefficient is tested by the short-run dynamics. Once the Error correction model has been estimated the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) is applied to assess the parameter stability (Pesaran, 1997). The results indicate the absence of any instability of the coefficients because the plot of the CUSUM statistic and the CUSUM of square (CUSUMSQ) fall inside the critical

bounds of the 5% confidence interval of parameter stability.

RESEARCH METHODOLOGY

- Silte zone is one of the 6 nationality administrative zone and 1 special wereda in the recently restructured the central region situated at about 173 km on the south of the capital city of Ethiopia road.
- The Siltie zone was established in 2001 by combining different areas following the establishment of siltie self-identity.
- At present, there are 10 weredas and five towns including the present werabe town.
- Therefore, in all directions the administrative center of the zone is werebe. Siltie zone is dominated by different chains of mountains including balche gafat and Amuste Mountains.
- Regard to relative location, it shares common boundaries with Siltie Hulbareg Alicho Wuriro snd dalocha in the north,south, east and west, and rural villages of Dalocha Town. Astronomically, Zonal capital, werabe town, is located within an approximate

geographical coordinates of 80 53' 38.50" N- 80 59' 58.17" N latitude and 380 35' 11.91" E- 380 39' 33.75" E longitude on the globe and its average elevation is 2365 meters above sea level.

Types, Sources and Methods of Data Collection

- In this study, both qualitative and quantitative data will be collected from primary and secondary sources.
- Primary data will be collected from selected investors using semi-structured questionnaires. The study will collect relevant information about the investors from owner /managers of the investment who represent the investment as a business entity.
- The questionnaire will be pretested by experts and investors the study area and necessary modification will be made for final data collection.
- Finally, the questionnaire designed for the private investors will be translated into the local language Siltigna to make it clear and collect real data from respondents.

Furthermore, secondary data will be collected from Zonal or werabe town investment office ’ annual reports, and different published and unpublished sources (since 2004-2014).

THANK YOU FOR YOUR ATENTION!!!

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