

An Economic Analysis of the Impact of Globalization on Ethiopian Economy: An Application of Error Correction Model

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Abstract

Nowadays the issue of globalization has received huge attention from researchers in different areas for the fact that we always hear about it but there exists little evidences of convergences. While some researchers argue pro globalization others pointed out the costs of globalization being outweighs its benefits and it fails to meet its potentials of benefiting both developing and developed world. This study has attempted to investigate the economic impact of globalization on Ethiopia using the annual data covering from 1991 to 2016 and by employing a co-integration analysis. The empirical result revealed that economic growth of Ethiopia is being affected by globalization both in the short-run and long-run. Thus economic growth and globalization have a long-run relationship which is found to be both positive and significant. Therefore, Ethiopia can be benefited more provided that if the economy of country is integrated and opened to competitions from the rest of the world.

Keywords: Co-Integration Analysis, ECM, Economic Growth, Ethiopia, FDI, Globalization, Trade Openness

1. Introduction

We hear about globalization all the time (Dowrick & Bradford, 2003) and it is the most hot issue among politicians and academician now a days but at the same time, it is rarely observed that some developing countries are in the time of catching up the development status of the developed economies. (Di Vaio & Kerstin, 2011) have found that the trends of economic growth were segmented in two different regimes, while there exists some convergence and fast growth in the per capita income of countries, there also exists divergence and different development patterns in other countries. In other words, limited evidences are witnessed as there exists convergence in the economic development of the world economy where the cases of East Asia after 1960 and OECD economies after the second world war are the most cited.

The main deriving factors towards globalization according to Tran (2005) includes increase flow of FDI, increasing number of Worldwide Corporations, trade liberalization and the decrease in transport and communication outlays. FDI is treated as a reason for the increased globalization that we are observing nowadays in the sense that it is the means to disseminating technologies and transfer new knowledge. High flow of FDI to the developing nations means new technology and knowledge is being diffused to be applied by the corresponding countries which in turn will increase the productivity domestically. Thus there will be higher tendency to export to the rest of the world for the reason that the transportation costs are becoming cheaper and cheaper.

There was a vast trade liberalization in the world after the second world war initially started with the foundation of GATT¹ and later replaced by the WTO where developed economies has made a dramatic lowering in the level of tariffs. Though it remains higher, developing countries has also made a reduction in the tariff. Generally speaking, since the late 1940s until the establishment of WTO member countries of GATT had meet for eight rounds where the main agendas were on tariff and related issues including tariffing the non-tariff trade restrictions. This is what exactly happened in the case of Ethiopia too where it has made a lot of trade reforms starting from the early 1990s according to Ferede et al (2004). According to the researchers, the trade reforms mainly concerned with stabilizing the macroeconomic situations of the country, facilitating the growth, poverty elimination and/or reduction and others. In support of all this, the country has been an observer of the WTO from 1997 -2003 and formally applied to be a member of the world trade system in January 2003 and is currently in the accession process to the club.

There are many studies on the subject globalization and its impact on the economic growth of different nations where some of the studies have used a cross sectional data, others like Adams (2010), Haile et al (2014), Kilic (2015) and so on have also used panel data to investigate the economic impact of globalization. Ray (2012), Feridun et al (2016), Afzal (2007) have used a time series data with different econometric models but it is really very rare case that researchers have conducted in a country specific studies on area specially in Ethiopia, it is almost none of studies have been conducted on the assessment of the relationship between economic growth and globalization. In fact, there are studies on the economic impacts of those proxies that are commonly used to measure globalization including trade liberalization, foreign direct investment, foreign aid and others. Therefore the main hypothesis which tested in this study is “ there exists a positive long-run associations between globalization and economic growth of Ethiopia .” Thus, the main motivation of this study is basically to see which of those proxies have higher impact on the economic growth and development of Ethiopia.

¹ GATT comes in to existence in 1947 and replaced by WTO in 1995 which was basically the result of 8th round meeting held in Uruguay Round

In a broad stroke, the study has attempted to assess the economic impact of globalization including trade, foreign-aid and FDI in Ethiopia. Moreover, the study presented the overall macroeconomic performances, the trend of import and export and flow of foreign aid coming from the developed economies to the country. Complement to this, the study is able to show which indicators of globalization¹ are affecting the economic growth of Ethiopia.

The study is organized in five different sections. The first part discussed the introduction part of the study, that is the subject matter is introduced. In the introduction section, the motivation of conducting a research on globalization and the main objective of the study is also presented. a review of different theoretical literatures, empirical works of scholars (that is., what is said and found by various researcher in the past) and the general overview of Ethiopian economy is summarized in the second section. The third chapter presents the data used, methodological issues of the study and description of the econometrics model as well. Interpretation and discussion of the empirical analysis and concluding remarks drawn from the empirical analysis and possible recommendations are forwarded in the last two chapters separately.

2. Review of Related Literatures

2.1. Introduction and Definition of Globalization

Globalization is basically defined in various ways however the central messages remains the same. Globalization in a broader stroke and according to J. Stiglitz (2006) includes different issues including capital flows, information and knowledge flows, uniformity in culture and other issues in the globe. Besides, A Ibrahim (2013) has defined globalization the process of homogenizing the economic, political, social and cultural aspects of the world. But this study is mainly dealt with the economic globalization part which essentially is the increasing economic integration of countries explained by the degree of trade flows that is the movement of goods and services in the world, aid flows, investment, declines in communication and transportation related costs (J.Stiglitz, 2006).

Theoretically, globalization was believed to bring an exceptional and/or unique improvements to both developed and developing economies however, evidences showed that it has been unsuccessful to reach at its potentials. J.Stiglitz (2006) pointed out that it is not the delinquency of globalization itself not to keep the promises of bringing benefits² to all rather it is due to the tactic globalization is handled.

Different international organizations including the IMF, WB and former GATT (later the WTO) have targeted in liberalizing the economy as a whole and trade in a specific way in the mid-20th century. The aid policy of the major donors had altered and developing countries were supposed to include opening of their economy to external competition in their long-term growth and development strategies while implementing the Structural Adjustment Programs. The foundation of World Trade Organization in 1995 is an ample forward step with a target of making the international trade to be as freer as possible by continuously reducing the tariff rates and other non-tariff barriers including quota, the domestic technical regulations, sanitary and phyto-sanitary issues, having simple licensing procedures and others.

2.2. Review of Previous Studies

This subdivision clearly presents the works of different scholars that explores the impact of globalization on the economy of developing countries using various methodological procedures. It is understood that researchers have used different techniques and different proxies for the degree of globalization including flow of aid coming from the developed economies, the degree of participation in the international trade, the flow of FDI, financial integration of countries and so on. Others like YING et al (2014) use three different globalization indexes: economic globalization, social globalization and political globalization to assess the association between globalization and economic growth.

Adams (2010) has studied the economic impact of globalization in the case of twenty nine Sub-Saharan African countries for the time periods from 1970 to 2008 by dividing in to eight different periods. The paper has used output per capita as a measurement for the growth of the selected countries and trade openness, domestic credit (proxy for financial integration), FDI, intellectual property right protection and consumption by the government are treated as an explanatory variables. To investigate the association between globalization and economic growth of SSA countries, the researcher has used different econometrics techniques including Ordinary Least Square method, Random Effect, Fixed Effect and Seemingly Unrelated Regression (SUR). The regression result of those all techniques alike and showed that with the exception of domestic credit and consumption by the

¹ The indicators of globalization according to this study are flow of foreign aid, degree of trade liberalization and Foreign Domestic Investment. While trade liberalization captures the economic integration, both FDI and foreign aid can capture the financial integration.

² The expected advantages of globalization according to J.Stiglitz includes [.....]" improvement of living standards of all people, creation of market access for the developing countries to sell their products, attraction of FDI"[.....] which in turn helps new products to be produced at a lower possible prices, free movement of people to other countries to work and be educated and help their families. However, A. Ibrahim (2013) had pointed out that globalization may end up with huge amount of *brain drain* in the sense that skilled labor may freely move to other countries where there is better working environment than their host countries. Thus this brain drain also in turn results lack of skilled labor for developing countries.

government which are found to be insignificant, all the explanatory variables exist to affect economic growth positively and significantly. The study has concluded that if one country economy is integrated with the rest of the world, then their economic growth will be stimulated and boosted. Besides, the reason why financial integration is found insignificant is that those countries have not yet liberalized their financial system and market to the external actors and has been simply slightly freed. In other words, the degree of financial integration is not sufficient enough to secure or yield positive effects of the globalization and they need to liberalize it further.

Kilic (2015) has tested the relationship between economic growth and economic globalization, political globalization and social globalization using seventy four developing nations by employing FE model. The study has found that due to the existence of cross-sectional relationships, any economic shock or changes in the aforementioned globalization proxies in one of the developing countries will one in another way affect the economy of other countries. The regression result showed that economic growth is positively and significantly being affected by both economic globalization and political globalization whereas, social globalization affects the economic growth of the developing countries inversely. As a result, those countries are recommended to promote international trade, attract FDI and enhance involvement in international party to catch up the developed world which secures a convergences in the world economic growth.

Meraj (2013), has attempted to assess the economic impact of globalization measured trade openness in Bangladesh by employing Granger causality test and ARDL. The researcher has used a secondary data for the periods strating from 1971 to 2005. The study used export and import variables to estimate the impact of globalization on economic growth. Gross domestic product has been treated as a proxy for economic growth of Bangladesh explained by the degree of exports and imports. The ECM and Granger Causality showed that there is bidirectional causality between export and economic growth but import does not cause economic growth. The researcher has recommended that developing countries in general should adopt an export oriented policies, for the reason, according to the Miraj (2013) is that the higher export level means generating higher foreign exchange that will be used to boost the accumulation of capital and in turn be used to pay import bills.

Ray, (2012) has employed an error correction model to investigate whether the economic growth of India is being affected by the globalization variables using the time series data from 1990 to 2011. The study has used trade openness and financial integration¹ as an indication of globalization, human resources development and physical capital which is estimated by the gross investment has used as the explanatory variables to assess the long-run relation between globalization and Indian economic growth. The result of the econometrics analysis revealed that trade openness affects the economy of India positively and it is also significant. Whereas financial integration, the other measurement of globalization comes to affect the economy inversely though it is insignificant. The other explanatory variables included in the model like human resources development, private and public investment have a positive impact on the Indian economic growth despite the impact of public investment is found to be insignificant. The study has found that India has been benefiting from the globalization by freeing the trade for the last few decades which is traced by the economic growth the country registering.

Feridun eta'al (2006) have conducted a research titled analysing the impact of globalization on economic development in developing economies with special emphasis to Nigeria. In doing so, the study has used an econometric model which is Error Correction Model for the annual data covering from 1986 to 2003. The research has applied a Harrod-Domar growth model where the level of output (measured by nominal gross domestic product) is explained by the level of physical capital (estimated by both private and public investment), trade openness, financial integration and debt series. Mete eta'al (2006) has used both trade integration and financial integration to see the economic impact of globalization in Nigeria where trade integration (openness) and financial integration are measured by the share of trade to GDP and the amount of both foreign capital inflow and outflow respectively. The study has found that trade openness positively and significantly affecting the economic growth of Nigeria which in turn implies that globalization has a positive economic impact and Nigeria can benefit by further liberalizing to external competition. Though the financial integration is insignificant, the nation can benefit from involvement and active participation in the international financial market according to the researchers. Finally, the study has recommended that Nigeria should be able to minimize the degree of corruption which is widening the income inequality between the rich and the poor. It should not only liberalize its trade but also need to adopt a better institutional and domestic economic policies in a way that intensify and boost the economic growth of Nigeria.

Afzal (2007) has examined the effects of globalization on the economy of Pakistan using an ECM for the periods 1960 to 2006. As others like Ray (2012) and Mete eta'al (2006) have used while studying the economic impact of globalization, Afzal (2007) has also used trade openness and financial integration to estimate the impact of globalization on the economic growth of Pakistan. The explanatory variables included in the model were trade openness, financial integration, human resources development public and private investment and all those variables are found to be cointegrated with the GDP according to the Johansen's Co-Integration technique. The

¹ Raya (2012), Mete eta'al (2006), Afzal. (2007) and others have measured the financial integration using the sum of capital inflow and outflow.

study has revealed that the proxies of physical capital (public and private investment) have been affecting the economy growth of Pakistan for the time periods under the study. However, both trade openness and financial integration do not have any short-run impact on the economy. Complement to this, the researcher has concluded that if the government of Pakistan be able to initiate and implement rigorous domestic policies then, the country will be able to reap the positive impacts of globalization.

3. Data and Research Methodological Issues

3.1. Description of Econometrics Techniques

While assessing the economic impact of globalization, the study has applied Engle Granger causality analysis, Johansen Co-Integration analysis and Error Correction Models. According to different literature reviews, this study has identified aid, trade liberalization, FDI, physical and human capital as the main determinants affecting once economic growth.

$$RGDP_t = F [AID_t, FDI_t, OPENESSt, PHYCAP_t, HCAP_t]$$

Where RGDP_t: Real Gross Domestic Product at period t

AID_t: The amount foreign aid flowing from the rest of the world at time t

OPENESSt: the degree of economic integration (Trade openness) at period t

PHYCAP_t and HCAP_t are physical capital and human capital respectively at periods t

The above expression can be rewritten as follows after it is transformed in to log-log form of equation to be estimated in the proceeding sections of the paper.

$$\ln RGDP_t = \beta_0 + \beta_1 \ln AID_t + \beta_2 \ln FDI_t + \beta_3 \ln OPENESSt + \beta_4 \ln PHYCAP_t + \beta_5 \ln HCAP_t + \varepsilon_t$$

where, $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

ε_t = white noise error term and others are log-form of the variables presented above.

According to the above model, it is believed that economic growth of Ethiopia is determined by the five variables included in the expression which are foreign aid, foreign domestic investment, trade openness, physical capital and human capital. Both the dependent and explanatory variables are expressed in a logarithmic form, the coefficients β_1 - β_5 take to mean the elasticities. Of all those coefficients, the sign of the first three betas are attention-grabbing for the reason that they are included as a proxies for globalization. At the same time, the magnitude of β_1, β_2 and β_3 is also crucial to identify which proxy of globalization come to affect the economic growth of Ethiopia further more than others.

As it is discussed in the previous sections, different researchers have used different proxies for globalization. YING et al (2014) and Barry (2010) uses the KOF index for globalization (economic globalization, social globalization and political globalization), others like Adams (2010) uses economic integration and financial integration. Others still uses flow of FDI, foreign aid and so on. In addition to the measurements of globalization used, the inclusion of physical capital and human capital is found to be recommendable. Because, the researcher strongly believe that the presence of skilled human power in a country means there will be higher potential to originate and innovate new goods and services which can stimulate the economy.

It is also concluded that international trade can benefit any countries involved in trade which potentially can transfer new technology and new knowledge. David Ricardo in his theory of comparative advantage for instance, both countries involved in trade can be benefited from specialization in the sense that countries will export all the products that can be produced domestically at lower cost and import those products from the rest of the world that are scarce and cannot produced at lower cost. As a result, trade is considered as the main device for economic growth of one's country (Echekoba and et al, 2015) and (Sebastian Edwards 1993).

3.1.1. Unit Root Test for Stationarity

The most fundamental starting point of a time series data is identifying whether the data in hand is stationary or not. In most cases, economic variables are non-stationary at their level. However, in few circumstances, those time series data set can be stationary if a growth is being used. According to A.H. Studenmund (2014), any time series whose its mean and variance do not change with time is stationary series. That is if both mean and variance are not varying over-time and if the correlation coefficient of a variables and their lagged variables depends on the lag lengths, then the time series are said to be stationary time series. Otherwise, if either of the above properties is violated, that is, if either mean and variance changes with time then the series is non-stationary. If a non-stationary variable is being regressed on another non-stationary dependent variable, the result will lead us to a spurious regression (M. Verbeek, 2004) where inferences based on such regression are confusing and estimators are false estimators.

In order to know whether the variables included in our model are stationary or non-stationary and to make sure that the regression result we obtained is not spurious, it is recommendable to use a non-stationary test which commonly are called Unit root test as it is indicated in A.H. Studenmund (2014). Henceforth, after having all variables included in the specified model being stationary, the problem of spurious regression will not be our stress. Traditionally, sketching a time series plot of variables can be used to identify if it is stationary or non-stationary by simply having a look if it is trending up, trending down or not. However, the most commonly used non-

stationary tests includes DF-test, ADF-test, PP tests, KPSS test and others where the former test is being used in this study which postulate there is unit root against the alternative hypothesis of the null-hypothesis is not true.

3.1.2. Johansen Approach and the EG Causality Test of Cointegration

Once the non-stationarity test (unit-root test) is performed using ADF test, the next step is simply testing for cointegration between the variables in the model provided that all the variables are I(1). According to A.H. Studenmund (2014), not all non-stationary time series data set leads to unacceptable or incorrect estimators. Two or more variables which are I(1) can be cointegrated provided that the linear combination of the variables is I(0) in which those circumstances indicates the presence of long-run relationship between the non-stationary variables. The existence of long-run associationship between the variables in the model in turn has its repercussion for the short-run behaviour of the variables for the reason that it will develop the variables to the long-run equilibrium relationship through a mechanism called error correction mechanism.

Since the study is a multivariate analysis, the study will not considers bivariate analysis to show whether there exists association between real gross domestic product and foreign aid, FDI and trade openness separately. The reason is that Engle granger is criticized in case there are more than two variables in the model.

3.1.3. Error Correction Model (ECM)

The third step after ensuring the existence of long-run relationship between the variables in the model is simply to run the error correction model. Ray (2012) has clearly stated that if there exists co-integration between the variables, then there must be either unidirectional or bidirectional Granger causality. The error correction model estimation will shows us the short run dynamics of the variables (individual effects of explanatory variables) and the speed of adjustment back to its long-run equilibrium as dependent variables do not adjust automatically or immediately. Generally speaking, in the cointegrating regression, the residuals are constrained by the cointegrating relationship; hence, they are never far from the regression line. In a spurious regression, the residuals would most likely be often far away and increasingly far with time from the regression line. Because the two cointegrated variables are trended, every extra observation spreads out the range of the sample then supports an accurate valuation than when they are stationary variables necessarily constrained to a narrower range of variation.

4. Results and Discussions

4.1. Trade Performance:

As it is discussed in the previous section, the degree of openness to the international trade shows how much ones' economy is exposed to international relationship or the degree of integration with the external market. Developing countries exports primary products (agricultural products) for cheap international prices and imports in turn capital goods including machineries, chemicals, automobiles and etc in higher prices which makes their trade balance to be in deficit. The case for Ethiopia is not different from those circumstance where the trade balance of the country is being in deficit for the last indefinite periods.

According to the expenditure approach of measuring GDP if import exceeds the export of one country then the GDP will be deteriorate given other things being constant. However, those deterioration can be counterbalanced and be compensated from the gains resulted from imports.

Table 4.1: The Trends of Export and Import for Ethiopia from 2006 -2015 in Billions of Birr

Indicators	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Economic Growth	11.43	10.75	8.69	12.66	13.07	8.65	10.58	10.26	10.39	7.34	10.38
Export Value	43.12	42.88	42.97	62.72	85.95	77.04	77.26	79.44	70.53	64.74	64.66
Growth	-	-0.57	0.22	45.96	37.04	-10.36	0.28	2.82	-11.22	-8.20	6.22
Import Value	108.70	115.93	117.43	151.87	162.49	177.01	179.39	198.56	228.17	224.62	166.42
Growth	-	6.65	1.30	29.32	6.99	8.94	1.34	10.69	14.91	-1.56	7.86
Trade balance	-65.58	-73.05	-74.46	-89.15	-76.54	-99.97	-102.1	-119.1	-157.7	-159.9	-101.75
Openness, % GDP	45.19	42.69	39.67	47.11	48.23	45.40	41.47	40.74	39.66	35.79	42.60

Source: NBE and author computation

4.1.1. Flow of Aid and Investment

In the beginning of aid history the main focus of the donors was to reconstruct the war torn Europe and later donors diversify their rationale behind helping developing countries with time. For instance; in the 1950s, USA was granting development assistance to countries in order to create alliance against the expansion of communism. The Structural Adjustment Program (SAP) can be also mentioned which was focused to make market based macroeconomic reforms by developing countries. This was considered as a conditionality to get foreign assistance and/or debt forgiveness from the developed world (Alemu, 2009).

Nowadays, Ethiopia is among the principal aid recipient. As per the data obtained from OECD-DAC and analysed, the country Ethiopia has received a net official development assistance of US \$2.03 billion, (which is equivalent to about 17.66 billion Ethiopian Birr) in 2006 making the 4th largest recipient from the African countries next to Nigeria, DR Congo and Sudan. In absolute term, ODA to the country has averaged around US\$3.3 billion over the last nine years (2006 – 2014). The table presented below shows the trend of development aid and foreign domestic investment flowing to Ethiopia and its corresponding growth for the recent last 10 years. The trend has

shown a positive increase in the specified period and also been experiencing oscillations for a 2012 and 2014. The country has enjoyed a very increasing foreign assistance after the adoption of Structural Adjustment Programs of the world dominant financial organizations, IMF and WB.

Table 4.2: The Flow of Foreign Aid and FDI from 2005-2015

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Aid ¹(Billions Birr)	17.66	22.5	30.77	39.8	44.51	56.3	55.57	70.69	68.38	78.88
Growth of Aid	-	27.40	36.80	29.32	11.85	26.48	-1.29	27.19	-3.26	15.34
FDI (Billion Birr)	4.73	1.95	1.00	2.31	3.72	10.10	4.81	23.31	40.67	43.56
Growth of FDI	-	-58.75	-48.61	130	61.03	171.74	-52.4	385.06	74.44	7.11

Source: NBE and authors computation

As of the case for the other economic variables, the economic impact of foreign direct investment on nations depends on the degree of internal capacity (including the level of education, local financial institution and so on) to capture and reap all the benefits associated with the technology and knowhow transferred through FDI. Therefore the flow of FDI coming from the developed economies may stimulate the economy of LDCs [...] Foreign direct investment improves the productivity of host nations and stimulates economic development a country's capacity to reap all the benefits of FDI externalities might be limited by local conditions, such as the development of local financial markets or the educational level of the country, i.e., absorptive capacities (Alfaro and eta'al (2009).

For the last two and have decades, Ethiopia has been attracting huge amount of FDI (IMF, 2016) for the reason that there are cheap labor and huge potentials in the manufacturing and agriculture sectors. In line with this, the economic policy of the country are becoming better and better from time to time as the government is working towards the attractions of investment from the rest of the world. During the life span of the last two growth and transformation plans (GTP-I and II), the government of Ethiopia has already putted a frameworks on the importance of private sector, competitiveness and foreign direct investment where both received a key emphasis to stimulate the economy. Being an agrarian country with backward technologies and higher dependency on weather was found to be the challenges faced by the people of the country. However, the role of agriculture sector to the economic growth is being replaced by the fast growth of service sector and to some extent by the manufacturing sector. It is not a totally transformation towards the industry but the agriculture will remain the main supporting sector the journey towards industrialization and for this reason both domestic and foreign investment are being incentivized by the government.

To conclude, like the case for all poor countries, foreign aid has been flowing to Ethiopia since the mid-twentieth centuries. Those aid are basically considered as the main means to finance the deficits, filling trade gaps and saving gaps by expanding the level of investment of the country. The adoption of poverty reduction strategy papers (PRSPs) in specific and WB and IMF sponsored structural adjustment programs by the government has been instrumental in attracting large and growing official development assistances and foreign direct investment as well.

4.2. Empirical Analysis

4.2.1. Unit root Test

Prior to carrying out the cointegration test and estimating the equation for the long-run showing the relationship between the economic growth of Ethiopia and globalization, it is recommendable to see nature of the time series data if it is stationary or non-stationary. A regression of non-stationary variable on another non-stationary dependent variable, the result will lead us to a spurious regression (M. Verbeek, 2004) and conclusions based on such regression are confusing and misleading. As a result, a unit root test (Augmented Dickey Fuller test and time series plot) is performed for all the variables included in the model and the test revealed that the variables are not stationary when they are tested at their level and become stationary at their first difference. Therefore, RGDP, AID, TO, EXPEDU and FDI are all I(1) as of the most economic variables. The following table summarizes the ADF test of stationarity at their level and first difference.

¹ Aid data is extracted from OECD Database

Table 4.3: Unit root test of stationarity using Augmented Dickey Fuller

Variables		ADF Test		
		P-Value (With-Out Constant)	P-Value (With Constant)	P-Value (With Constant ad Trend)
LnRGDPt	Level	0.9912	1	0.9994
	First Difference	0.7369	0.0261**	0.0000***
LnAIDt	Level	0.9997	0.7797	0.0089
	First Difference	0.0507*	0.0000***	0.0000***
LnTOt	Level	0.8435	0.6515	0.7381
	First Difference	0.0000***	0.0000***	0.0001***
LnFDIt	Level	0.9613	0.8903	0.2642
	First Difference	0.3521	0.0075***	0.0534
LnEXPEDUt	Level	0.1267	1	0.9424
	First Difference	0.8795	0.0107**	0.0052***

Source: author computation using GRETL

H_0 : Not Cointegrated is tested against H_1 : variables are cointegrated.

Therefore we can proceed to the next step of testing for cointegration test either by using the EG causality test or Johansen Cointegration test. However, EG causality test is criticized in the case we are having a multivariate analysis. This study therefore applies Johansen cointegration test to see whether the variables are cointegrated or not.

As it is stipulated in different works including Studenmund (2013), (M. Verbeek, 2004), Wooldridge (2000), variables need to be the same order in order to conclude that there exist cointegration between variables. Thus as we have shown the variables are all I(1), and the next step is testing for the cointegration test which will show us an evidence of long run relationship between the measurements of globalization and economic growth. EG Causality test is mostly criticized in case there are more than two variables, that is the problem of uniqueness. Thus, to avoid this problem a Johansen test is required to determine how many cointegrating vectors there are for a set of variables.

The optimal lag length is determined from the unrestricted VAR equation that minimizes the Akaike Information Criterion, Schwarz Information Criterion or Hannan-Quinn Criterion. In doing so, the maximum lag order is set to be 4 recommended by the software and later decided to be 1 using the above criterion that makes the lag minimum. The asterisks below indicate the best (that is, minimized) values of the respective information criteria, AIC, and HQC.

Table 4.4: Lag length Selection criteria using AIC, SIC and HQC

lags	loglik	p(LR)	AIC	BIC	HQC
1	91.59693		-3.651415*	-2.032397*	-3.123656*
2	115.83660	0.00327	-3.602361	-0.826902	-2.697631
3	138.61608 0	.00722	-3.459102	0.472799	-2.177400
4	157.91490	0.04040	-3.091284	1.997058	-1.432612

Source: author computation using GRETL

So far, variables of the model are tested for stationarity and found to be stationary when they are differenced once, and the maximum lag order is determined using the vector auto-regressive equation with the help of AIC, SIC or HQC. Since the number of variables are more than two, it is better to use the Johansen test for cointegration to see whether there is long run relation or not. The following table summarizes this test. The trace and Lmax test statistics results discovered that there exists a significant long-run associationship between globalization and real gross domestic product. i.e., rank equals to zero implies that the null hypothesis of no cointegration relation exists between the variables is tested against there is one cointegrating relationship and the test statistics suggest that there is one cointegrating relations (at 1% level of significance).

Table 4.5: Johansen test for cointegration

Rank	Hypothesis		Eigen value	Trace-Test	P-Value	L-Max Test	P-Value
	Null	Alternative					
0	$H_0 = 0$	$H_1 = 1$	0.73769	100.56	[0.0000]	45.500	[0.0006]
1	$H_0 \leq 1$	$H_1 = 2$	0.58766	55.061	[0.0080]	30.121	[0.0198]
2	$H_0 \leq 2$	$H_1 = 3$	0.38884	24.941	[0.1687]	16.741	[0.1916]
3	$H_0 \leq 3$	$H_1 = 4$	0.20058	8.1992	[0.4516]	7.6118	[0.4283]
4	$H_0 \leq 4$	$H_1 = 5$	0.017131	0.58750	[0.4434]	0.58750	[0.4434]

Source: author computation using GRETL

Having found the variables to be cointegrated, it is time to estimate our error correction model. This will help us to show how our variables of the model are related to each other in the short-run. The equation for the error

correction model can be rewritten as follows:

$$\Delta \text{LnRGDP}_t = -0.539 + 0.038\Delta \text{LnAID}_{t-1} + 0.108\Delta \text{LnEXEDU}_{t-1} + 0.164\Delta \text{LnTO}_{t-1} + 0.005\Delta \text{LnFDI}_{t-1} + 0.54\Delta \text{LnRGDP}_{t-1}$$

(0.1784)*** (0.0227) (0.0822) (0.0653)** (0.0059)** (0.1772)***

N= 33

DW Statistics = 2.32

R² = 0.72 and Adjusted R² = 0.67

*, ** and *** means significant at 10%, 5% and 1% respectively

As it is shown in the above equation, the ECM is economically and statistically meaningful in the sense that it is negative and less than one. Therefore, according to the regression, the error correction term -0.539 shows that the economic growth measured by the real GDP adjusts to its long run equilibrium with a speed of about 54 percent annually. In addition to the adjustment speed, this short dynamics shows the individual effects of the explanatory variables. For instance; last year's RGDP is showing positive and significant impact on current year RGDP that is, for every one percent change in the last year's RGDP, the current RGDP changes in about 0.18 percent on average, Ceteris Paribus.

Similarly, the other explanatory variables have also a short-run effect on the economic growth of the country with the exception of foreign aid and expenditure on education where they both have a positive and insignificant impact on the economic growth. Whereas, the other measurements of globalization according to this study (trade openness and FDI) and the last years real GDP (lagged RGDP) has a direct and a significant impact on the economic growth. Therefore, Ethiopia has been benefiting from the globalization and will benefit more if the country is being integrated with the rest of the world through liberalization of its trade and creating a conducive environment to attract foreign direct investment.

Table 4.6: Long-run estimates (Normalized Beta)

Variables	LnGDPT	LnAIDt	LnEXPEDUt	LnTOt	LnFDIt
Coefficient (β)	1.000	0.20595	0.78104	0.98277	0.18606
Standard Error	(0.0000)	(0.10655)	(0.08969)	(0.17809)	(0.02311)

Source: Author computation using GRETl

This study found that the ratio of trade to GDP, a proxy for the degree of trade openness comes to affect the economic growth positively and the impact is significant. This study supports the findings of different researches including (Hamad and eta'al, 2014), (Chimobi, 2010), (Manni & Munish, 2012), (Andersen & Ronald, 2008) and (Silva and eta'al, 2013) who all concludes that economic growth increases following with trade liberalization. Through efficient allocation of resources, freer trade policies of countries will have the ability to boost the economic growth and development of those poor countries including Ethiopia. As it is mentioned in the introduction part of this paper, Ethiopia is in the process of joining the world leading trade institution which is WTO starting from January 2003. However, the accession process took longer time for the reason that the government is not willing to open the financial and telecom sector which are the most important areas to be liberalized as much as possible so as to have an integrated economy viz-a-viz the rest of the world. Well, this paper is not recommending to fully liberalize the sectors which the government considers them sensitive to him, but opening to some degree(including joint-venture) will be increase the degree of integration.

Foreign aid is affecting RGDP positively and significantly as of the study by Bhattarai (2005) who studied the relationship of those two variables for Nepal case and Birara (2011) a study for the case of Ethiopia. This paper basically shows how much aid is effective in terms of bringing positive economic growth in Ethiopia. Helping others who are in a need of it means putting "plaster in a wound" which at least can minimize the pain. Similarly foreign aid may not a sustainable solution but still it is contributing a lot in the developing countries by saving millions of life, as of the case for Ethiopia, it is also making the economy to step forward. It is very common to observe that many individuals travel for longer hour on foot, horse or other traditional transportation system to get social services including education and hospitals due to shortage of those infrastructures in nearest possible area.

The case for the FDI is also not different from the above two measurements of Globalization. It affects the economic growth significantly and positively which is consistent with the studies of (Khaliq & Ilan, 2007), (Alfaro, 2003) and others. Higher foreign direct investment means higher transmission of new technology and knowledge, increased domestic production, higher job creation and at the end of the day, the country will able to export to the rest of the world.

Generally, the economic growth of the country is affected significantly and positively by the proxies of globalization used in this paper. Therefore, the country should adopt a freer domestic trade policies that further integrated with the world economy. As Ethiopia is not a separated island, joining the club or party of globalization in every aspect will be ensure the sustained growth of the economy.

Regarding the diagnosis, the study comes with different procedural tests performed to come up with this final stage, therefore it is evidenced that the model specification followed in the study do not exhibit any statistically problem and as a result this can be taken as a good representation of the variables.

Finally, the goodness of the fit (R-squared and Adjusted R^2) of the model are elaborating a considerable relationship of the variables. About 72.2 percent (using R-squared) and 67 percent (using Adjusted R^2) of variations in the real gross domestic product is described by the variations in the independent variables included of the model. The Durbin-Watson statistic is also showing that error terms are not serially correlated.

5. Conclusion and Recommendation

We hear about globalization all the time and it is the most hot issue among politicians and academician now a days but at the same time, it is rarely observed that some developing countries are in the time of catching up the development status of the developed economies. The trends of economic growth were segmented in two different regimes, while there exists some convergence and fast growth in the per capita income of countries, there also exists divergence and different development patterns in other countries.

This study has attempted to investigate the economic impact of globalization in the case of Ethiopia using a cointegration analysis using the data from 1991 to 2016. For this study, globalization is measured using three different variables including trade openness, FDI and foreign aid where the first variable captures the degree of economic integration and the remaining two variables explains the financial integration.

By and large, since we are living in the world where assisting others who are in a need of the help is a culture. This study is also in favour of foreign aid. Who knows best about a patient: the doctor or the patient? Therefore, whatever the degree of aid effectiveness is, it is found that aid is helping developing countries in general and Ethiopia in specific by saving lives of millions of people, bringing positive economic growth and other related contributions.

The foreign aid and FDI coming from the rest of the world is required to be invested in the most productive sectors (investment areas) including agriculture, infrastructural developments and other areas which in turn stimulates the economy as a whole. In addition to this, the government need to minimize the bureaucratic nature and rent seeking behavior of individuals and institutions which limits the effectiveness of aid.

Whereas the donors should also to have a clear cut follow up commitment that tracks the progress of every dollar granted to the developing countries in general. Otherwise all those billions of dollars coming from the developed world may attract extra interest from the governing body to be corrupted. It should not be granted in a reciprocity principle where donors give aid to countries in an exchange or expectation of something to get back from them. The conditionality for granting aid is sometimes challenging to meet and as a result those should be minimized as far as possible.

Finally, further investigations on the economic impact of globalization at sector specific, in regional level, inclusion of new variables in to the model, the use of non-linear model specification and methodology is highly recommended. Besides, the inconsistencies of data reported by national institutions (including NBE and MoFED) as well as figures reported by WB, IMF, OECD and others needs to be harmonized as much as possible.

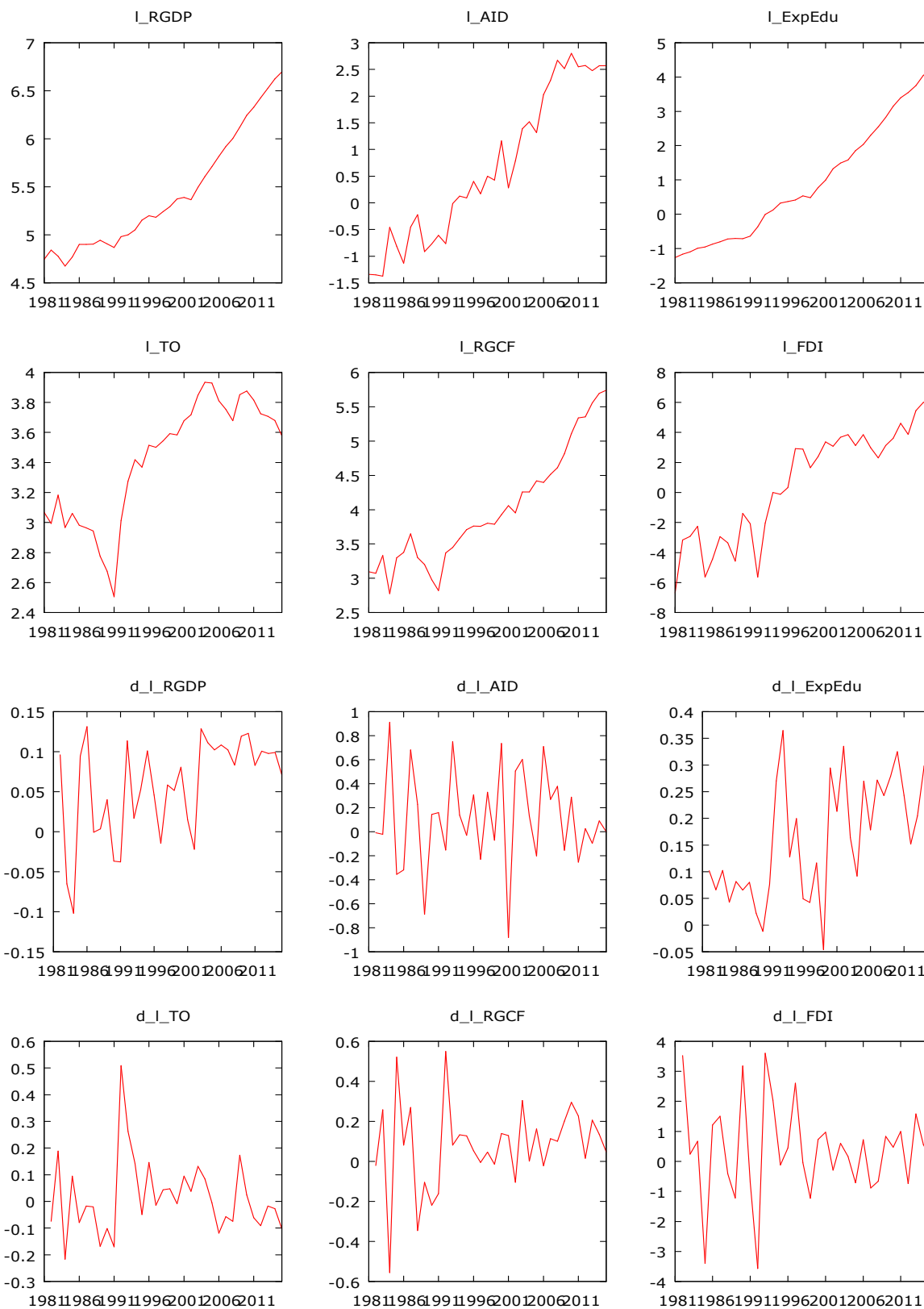
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Appendices:

Annex 1: Time series plot for unit root test



Annex 2: Vector Error Correction Model

	LnRGDPt	LnAIDt	LnEXPEDUt	LnTOt	LnFDIt
Cointegrating vectors, Beta	1.0000 (0.0000)	0.20595 (0.10655)	-0.78104 (0.089699)	-0.98277 (0.17809)	0.18606 (0.023108)
Adjustment vectors, Alpha	-0.073904	-0.26026	-0.11469	0.075511	-2.9366

Equation 1: d 1 RGDP

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.176772	0.0495161	3.5700	0.0012	***
EC1	-0.0739038	0.0300371	-2.4604	0.0195	**
Mean dependent var	0.057332		S.D. dependent var	0.061111	
Sum squared resid	0.103637		S.E. of regression	0.056909	
R-squared	0.159082		Adjusted R-squared	0.132803	
rho	0.025650		Durbin-Watson	1.947953	

Equation 2: d 1 AID

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.535544	0.349665	1.5316	0.1355	
EC1	-0.260264	0.212111	-1.2270	0.2288	
Mean dependent var	0.114916		S.D. dependent var	0.404938	
Sum squared resid	5.168024		S.E. of regression	0.401872	
R-squared	0.044935		Adjusted R-squared	0.015089	
rho	-0.325716		Durbin-Watson	2.634002	

Equation 3: d 1 ExpEdu

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.346011	0.0901386	3.8387	0.0005	***
EC1	-0.114691	0.0546793	-2.0975	0.0439	**
Mean dependent var	0.160652		S.D. dependent var	0.108802	
Sum squared resid	0.343433		S.E. of regression	0.103597	
R-squared	0.120869		Adjusted R-squared	0.093397	
rho	0.285626		Durbin-Watson	1.394803	

Equation 4: d 1 TO

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-0.107055	0.122218	-0.8759	0.3876	
EC1	0.0755106	0.0741389	1.0185	0.3161	
Mean dependent var	0.014982		S.D. dependent var	0.140545	
Sum squared resid	0.631376		S.E. of regression	0.140465	
R-squared	0.031399		Adjusted R-squared	0.001130	
rho	0.122163		Durbin-Watson	1.736468	

Equation 5: d 1 FDI

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	5.12147	1.11513	4.5927	<0.0001	***
EC1	-2.93657	0.676452	-4.3411	0.0001	***
Mean dependent var	0.375522		S.D. dependent var	1.590850	
Sum squared resid	52.56185		S.E. of regression	1.281623	
R-squared	0.370641		Adjusted R-squared	0.350973	
rho	0.135830		Durbin-Watson	1.651796	

Cross-equation covariance matrix:

	l_RGDP	l_AID	l_ExpEdu	l_TO	l_FDI
l_RGDP	0.0030481	-0.0066896	0.0014334	0.0020808	-0.043407
l_AID	-0.0066896	0.15200	0.0060826	-0.0015907	0.063609
l_ExpEdu	0.0014334	0.0060826	0.010101	0.0049141	-0.033824
l_TO	0.0020808	-0.0015907	0.0049141	0.018570	-0.014449
l_FDI	-0.043407	0.063609	-0.033824	-0.014449	1.5459