An Assessment of the Economic Impact of Globalization In Ethiopia: A Co-Integration Analysis

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30 September 2017

Academic year 2016-2017

Erasmus Mundus Joint Master Degree
in Economics of Globalisation
and European Integration

An Assessment of the Economic Impact of Globalization In Ethiopia: A Co-Integration Analysis

Master dissertation

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Submission date	September 2017

Declaration

I, cherkos Meaza, do hereby claim that the thesis titled ***"An Assessment of the Impact of Globalization on the Economic Growth of Ethiopia: A Co-Integration Analysis"*** is an original work of me and did not putted forward for other program. References used are credited in the literatures and resources.

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September 30, 2017

Addis Ababa, Ethiopia

Acknowledgement

Thanks to EU for the sponsorship to pursue Advanced Erasmus Mundus Master program and to my supervisor Professor Andrea Cabello for giving me the supervision and the constructive advises from the beginning to the completion of the study.

My heartfelt gratitude is also extended to all my families and friends who have contributed and gave me the courage directly and indirectly in my life.

Contents

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 1980 to 2015 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.

Key words: Co-Integration Analysis, ECM, Economic Growth, 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.

Various writings has found different results on the associations between globalization and economic growth of countries in general that is, it remains inconclusive Vadlamannati and Rao (2009) whether the globalization we see now a days affect the economic growth and development of countries positively, negatively or are unrelated issues.

There was a vast trade liberalization in the world after the second world war initially started with the foundation of GATT[1] and later replaced by the WTO where developed economies has made a dramatic lowering in the level of tariffs. Though it remains higher, developing

[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

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 eta' 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 eta'al (2014), Kilic (2015) and so on have also used panel data to investigate the economic impact of globalization. Ray (2012), Feridun eta'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.

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 globalization[2] 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] 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. Review of Related Literatures

2.1. Introduction and Definition of some concepts

This section starts by defining what exactly globalization means according to different scholars and how it is going to be explained. Besides, the terms foreign aid, trade liberalization, foreign direct investment and other related concepts are defined. Various empirical and theoretical works of many scholars who conducted on the subject matter are also reviewed so that the study will have its own side on the impact of globalization to the developing countries economy in general and Ethiopia in a particular sense.

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 benefits[3] to all rather it is due to the tactic globalization is handled.

[3] 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.

So far, no clear conclusion has been drawn on the effects of increasing degree of globalization to different market structures but generally speaking as there exists higher economic integration, there would be higher degree of competition which in turn leads to perfectly competitive markets or near to perfect according to Tisdell (2008). At the same time, there will also more efficient resources allocations worldwide. However, it is still unavoidable to have some blockages to entry in to national markets as a result of different measurements taken by different countries including tariff and non-tariff measures.

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 t0 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 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 ones 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 integration[4] 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 analyzing 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

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

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 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 able to reap the positive impacts of globalization.

In the following consecutive sections an empirical reviews on the associations between economic growth and foreign aid, economic growth and trade liberalization , economic growth and FDI is presented for a purpose of evaluating what has done so far on the subject matter which is used as a benchmark to explore the economic impact of globalization on developing countries in general and Ethiopia more specifically.

2.2.1. Foreign Aid and Economic Growth

Liew eta'al (2012) employed panel data methods, more specifically Pooled OLS, Random Effects, and Fixed Effects (and uses Breusch-Pagan LM test (POLS model vs. RE) and Hausman test (RE vs. FE) to determine which model is best for final estimation of the relationship) to explore how foreign aid and economic are related EAC[5] using the data from

[5] EAC: East African Countries

1985 to 2010. Empirical analysis of the regression suggested foreign aid has significant and inverse influence on economic growth. This calls for further studies to investigate the possible channels through which foreign aid can have positive influence on growth.

Gomanee eta'al (2002) attempted to explore the grant effect to the economy 25 selected SSA[6] nations by using residual regressors approach on the pooled data collected for the period 1970 to 1997. They have identified three mechanisms of transmission where aid can be channeled to economic growth: investment, import financing and government spending. The researchers found that there is encouraging and direct effect of foreign aid to the SSA nations' economy. Finally, they concluded that African low growth appearance is not necessity the result of aid ineffectiveness.

2.2.2. Trade Liberalization and Economic Growth

Hamad and eta'al (2014) have used simple linear regression technique (OLS) to investigate the economic impact of trade liberalization in the case of Tanzania using the time series data from 1970 to 2010 by separating the two trade regimes; closed economy regime (1970 - 1985) and open economy regime (1986 – 2010). The result of the regression showed that economic growth of Tanzania is being affected positively by the trade openness and the effect is significant. Moreover, the positive effect of trade openness was comparatively higher during the time of closed economy than open economy regime.

Felix and eta'al (2013) have examined the relationship between economic growth and trade liberalization in the case of Nigeria using cointegration analysis and found that there exists long-run relationship between economic growth and trade liberalization. Adoption of Free trade policy is recommended by the researchers for the reason that there is an encouraging associations of trade liberalization on the Nigerian economic growth. However, export is found to affect the economy of Nigeria inversely.

Okonkwo eta'al (2015) have found that economic growth of Nigeria is affected by the level of export and import positively and significantly. Finally the researcher has recommended that Nigeria should have to liberalize its trade policy and open it to the rest of the world.

[6] SSA : Sub-Saharan Africa

2.2.3. Foreign Direct Investment and Economic Growth

The relationship between FDI and economic growth is also inconclusive as of the case for the other economic variables. depending on the degree of internal capacity (including the level of education, local financial institution and so on) to reap all the benefits associated with the technology and knowhow transferred through FDI. Provided that the educational level is sufficient enough and the domestic financial market is well developed, the economy of nations will be enhanced with higher degree of FDI. For instance: Alfaro and eta'al (2009) has concluded that economic growth will be highly stimulated in those countries with more financially advanced than those countries with lower financial development.

Samad (2010) has used the evidences from SE Asia countries and Latin America countries and employed ECM technique to explore whether FDI causes economic growth or not. The regression analysis revealed that there is a long-run connection between foreign direct investment and economic growth. In some of the countries under the study, the result showed that there is short run bi-directional linkage and in other nations, there exists a uni-directional relationships between FDI and economic growth.

3. Data and Research Methodological Issues

3.1.Introduction

The main goal of this study is to assess the economic impact of globalization for developing countries in general. In doing so, study has employed basically a secondary data which encompasses the annual data from 1981 to 2015. The data for the foreign aid granted to Ethiopia for the period specified above is taken from the OECD database. The data for the import and Export which are used to estimate the degree of openness by adding both and dividing to the Gross Domestic Product and Foreign direct investment are taken from the National Bank of Ethiopia. Other variables of the model like gross capital formation and expenditure on education are also taken from MoFEC.

RGDP is considered as a measurement for the economic growth of countries most commonly. In fact economic growth can be measured by different variables in different research (Ray, 2012) depending on the relevance of the subject matter. Besides It can be also different the way researchers use in different countries and with time periods. However, for the sake of simplicity, this study is using RGDP as its proxy. The main measurement of globalization included in the model are the level of FDI, Aid and degree of Ethiopia integration measured by trade openness. The share of export and import to RGDP of the country explains the extent of openness. In most literatures, trade openness is defined as to the level which countries or economies allow or have trade with other countries or the degree of international exposition. Furthermore, physical capital measured by the Gross Capital Formation and Human capital which is measured by the expenditure on education of the country has been included as explanatory variables in the model.

3.2.Description of Econometrics Techniques

3.2.1. OLS Method

While assessing the economic impact of globalization, the study has applied different econometrics techniques starting from OLS analysis, Engle Granger causality analysis, Johansen Co-Integration analysis and Error Correction Models. To start with the OLS technique, the simple regression equation used is the following.

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

Where RGDPt: Real Gross Domestic Product at period t

AIDt: 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

PHYCAPt and HCAPt 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.

$$\mathbf{lnRGDPt = \beta_0 + \beta_1 lnAIDt + \beta_2 lnFDIt + \beta_3 lnOPENESSt + \beta_4 lnPHYCAPt + \beta_5 lnHCAPt + \varepsilon_t}$$

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

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 $\mathbf{\beta_1 - \beta_5}$ take to mean the elasticities. Off 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 $\mathbf{\beta_1}$, $\mathbf{\beta_2}$ **and** $\mathbf{\beta_3}$ 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 eta'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 eta'al, 2015) and (Sebastian Edwards 1993).

3.2.2. 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.

ADF test of non-stationary can be performed using three different forms (M. Verbeek, 2004) which are without constant term, with constant word being added and with both constant term

and trend being added. Regardless of all those forms, the decision of test is similar and the same.

3.2.3. 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 behavior 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 our 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. Therefore, this type of cointegration test to be performed, the study has reduced the model in to bivariate analysis as it is mentioned in the above which is not a plan. Therefore we have to stick to the Johansen cointegration test only. In fact this bivariate analysis provides a preliminary image of how globalization is affecting growth of Ethiopian economy.

3.2.4. 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.

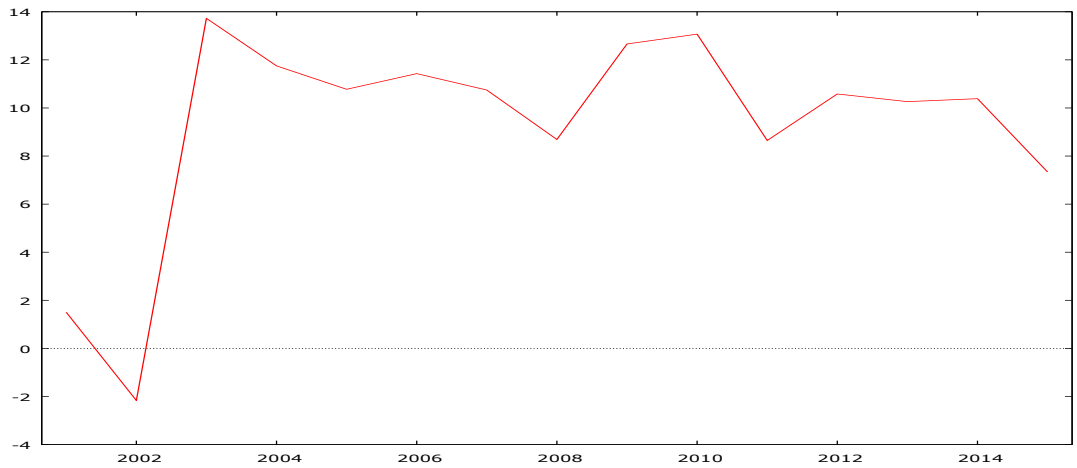
Generally speaking, in the cointegrating regression, the residuals are constrained by the cointegrating relationship; hence, they are never far from the regression line. In a spurious regression, the residuals would most likely be often far away and increasingly far with time from the regression line. 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.Overall Macroeconomic Performance of Ethiopia

According to IMF country report of 2016, the economic growth of Ethiopia has declined from the previous years due to the negative effects of the harsh drought happened in the country and fragile worldwide environment. However, the decline in the economic growth has moderated or alleviated with an effective implementation of timely policies to tackle the problems associated with drought. This slowdown in the economic growth is simply is in comparative to the previous years where the country has consistently registered a positive economic growth and at the same time poverty reducing record for above ten years starting from 2004. The share of service sector to the GDP growth is basically increasing with time while the role of agriculture is being undertaken by the growing service and slightly by industry sectors though it contributes higher share in absolute term. However, being dependent on the weather and traditional tools means it is too challenging to keep the role of agriculture on the economy as consistent as it should be. Whenever there exists, shortage of rainfall, the productivity of the economy will automatically decline (Willenbockel and eta'al , 2008) and that is why huge amount of Ethiopian people are adversely affected by the drought which in turn results in a fall in the economic growth as of the past two years. Succeeding to the previous long term policies[7] implemented by Ethiopia , the country has currently adopted a five years plan which is GTP-II as a means that paves the way to secure the medium income level in the next ten years.

Fig 4.1: The Trend Of Economic Growth of Ethiopia from 2000-2016 taken from NBE data



[7]SDPRP , PASDEP and GTP-I are poverty reduction 5 years programs adopted from 2001/02 to 2004/05, 2005/06 to 2009/10 and 2010/11 to 2014/15 respectively.

As it is shown in the above figure, the economy of the country is growing with time with the exception of the beginning of 2000s. In the early periods, the economy growth declines and reaches a negative figure in 2002. These decline in the growth are mostly associated with Ethio-Eritrea war which caused a lot of damages in human life as well as in materials. However, the economy started to grow in an increasing rate which is about 11.7% in 2004 and showed a positive growth for the consecutive 10 years ranging from 8.7 % in 2012 and 13.5% in 2011.

4.1.1. 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

4.1.2. 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 analyzed, 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 [8](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

[8] Aid data is extracted from OECD Database

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. Summary of Statistical results

In this section, a detailed descriptive statistical summary is carried out before jumping into to the main econometrics analysis. As it is shown in the table below, the average of Ethiopia's GDP was ETB 249.7 billion and the average of foreign aid coming from the RoW was about 3788.6 million Ethiopian birr during the sample period. Likewise, the average of foreign direct investment is estimated about 3763 million birr (see annex 2).

Finally, the average share of trade/ GDP ratio measuring the degree of trade liberalization is found to be very low which indicates that Ethiopia's overall policy is not opened to international and economically and financially integrated with the rest of the world. This is not advisable according to most research in the sense that with such a globalizing world economy no one is a separated Island to reject joining to the club. A country is basically considered to benefit from trade by creating employment opportunity and is assumed to be the main channel for technological transfer from those developed countries. Therefore, if a country has not liberalized its policy to external world, then it implies the economy is not benefiting from the rest of the world.

4.3. Empirical Analysis

In order to understand the economic impact of globalization measured by trade openness (that captures the extent of economic integration) and Flow of FDI and Foreign aid (which both captures the financial integration), a simple regression is carried out. Furthermore, expenditure of education that measures the human capital and real gross capital formation are also considered in the model that are considered as explanatory variables. For this purpose, three different an OLS regression are performed using the linear –linear form and logarithmic form of the variables.

With regard to the signs of the explanatory variables, the following table reveals that signs are as of the expectation. In the first model, the explanatory variables foreign aid, expenditure on

education, trade openness and gross capital formation are found to be significant at 1% whereas the foreign direct investment is insignificant at any level. In model 2, when the gross capital formation is excluded from the model, the other variables (AIDt, EXPEDUt, Tot and FDIt) are all significant at 1%. In both models, the explanatory variables included in the model have a positive impact on the economic growth of the country. Now it is a turn to look at the magnitude of the effects of a unit change in the independent variables on the RGDP of Ethiopia for comparison purpose of which measurements of globalization exist to affect the economy. Referring to model (1), On average, other things being the same, a one Ethiopian birr change in the foreign aid has a 7.8 Birr change in the real gross domestic product of the country. With the same fashion, a one Birr change in expenditure on education and gross capital formation leads to 4.90 birr and 0.97 birr change on average in the RGDP respectively. Holding everything to be constant, a 1 percent increase in the share of trade openness will have an impact of 1.6 percent increase in the real gross domestic product.

Table 4.3: Simple Ordinary Least square results

Independent variables	**Dependent variable**		
	Model (1) RGDPt	**Model (2) RGDPt**	**Model (3) LnRGDPt**
Constant	69.3607***	72.7789***	5.47066***
	(8.65845)	(9.61135)	(0.182643)
AIDt	7.80741***	7.65558***	
	(1.43021)	(1.60107)	
LnAIDt			−0.031653
			(0.0326635)
EXPEDUt	4.90146**	9.95903***	
	(1.90326)	(0.912563)	
LnEXPEDUt			0.430028***
			(0.0263266)
TOt	1.60636***	2.56755***	
	(0.454009)	(0.352922)	
LnTOt			0.118116**
			(0.0547429)
RGCFt	0.972713***		
	(0.330823)		
LnRGCFt			
FDIt	−0.108661	0.221593**	
	(0.101877)	(0.105701)	
LnFDIt			0.0146204*
			(0.00731942)
R-Squared	0.995363	0.993981	0.990430
Adjusted R^2	0.994564	0.993179	0.989154
Standard Error	14.64638	16.40684	0.063635
Observations	35	35	35

***, ** and *** represents Significant at 10%, 5% and 1% respectively**

Standard errors in parenthesis

In the second model where there are four explanatory variables, as said before, they have a positive and significant effect on the economic growth which indirectly implies that Ethiopia is benefiting from the globalization one in another way. It is been said in the previous sections that the degree of trade liberalization, flow of aid and FDI has increased in the last three decades after the government of Ethiopia has adopted the structural adjustment programs and as a result the economic growth of the country has shown a tremendous step forward especially in the last 15 years which makes the country one of the fastest growing economy in the world.

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.

Table 4.4: 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 4.5: 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 4.6: 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	$H_0 <= 1$	$H_1 = 2$	0.58766	55.061	[0.0080]	30.121	[0.0198]
2	$H_0 <= 2$	$H_1 = 3$	0.38884	24.941	[0.1687]	16.741	[0.1916]
3	$H_0 <= 3$	$H_1 = 4$	0.20058	8.1992	[0.4516]	7.6118	[0.4283]
4	$H_0 <= 4$	$H_1 = 5$	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:

$$\Delta LnRGDpt = \underset{(0.1784)***}{-0.539} + \underset{(0.0227)}{0.038\Delta LnAID_{t-1}} + \underset{(0.0822)}{0.108\Delta LnEXEDU_{t-1}} + \underset{(0.0653)**}{0.164\Delta LnTO_{t-1}} + \underset{(0.0059)**}{0.005\Delta LnFDI_{t-1}} + \underset{(0.1772)***}{0.54\Delta LnRGDP_{t-1}}$$

N= 33

DW Statistics = 2.32

$R^2 = 0.72$ and Adjusted $R^2 = 0.67$

*, ** 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 4.7: 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 1981 to 2015. 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 favor 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.

The study also found that human capital as the main driving variable in the growth equation. Therefore, policy makers need to put their attention in the development of skilled human power through long and short term training schemes.

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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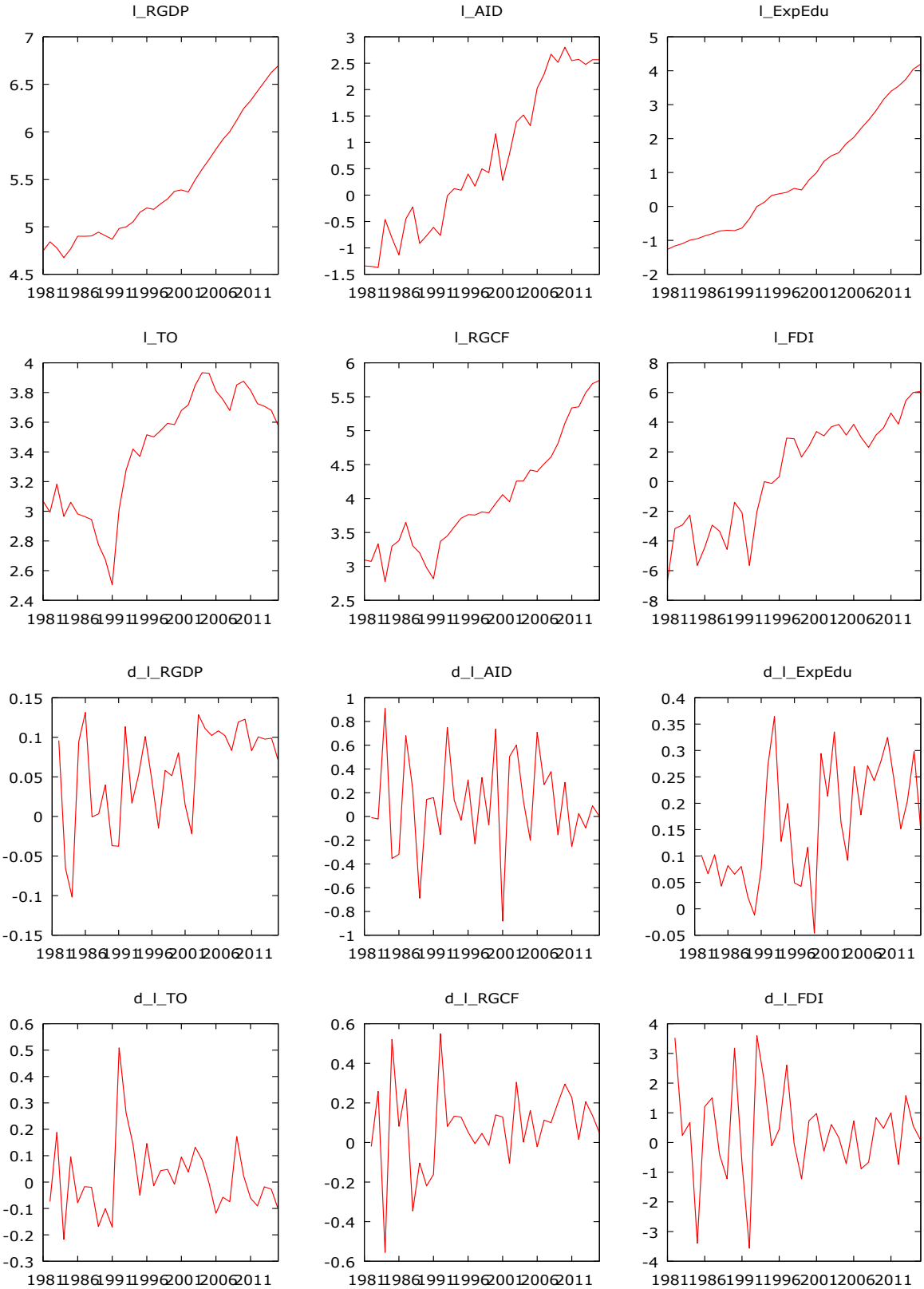
Appendices:

Annex 1: Time series plot for unit root test



Annex 2: Summary of Statistical results for the data series 1975 - 2016

Variables	RGDPt	AIDt	TOt	FDIt	EXPEDUt
Mean	249689	3788.26	30.5894	3763.09	9.7347
Median	164543	1114.19	29.7967	93.88	1.6257
Min	102407	71.763	12.2418	0.0621	0.28206
Max	808489	16491.4	51.0868	43559.2	66.456
Std. Deviation	192056	5146.6	11.5654	9545.97	16.763
C.V.	0.76918	1.35856	0.37809	2.53674	1.7220
Skewness	1.57245	1.251	0.22571	3.39714	2.1328
Ex. kurtosis	1.37378	-0.0757	-1.3464	10.5866	3.6471
5% Perc.	103170	78.0292	14.7478	0.07142	0.30631
95% Perc.	742599	14252.9	50.4725	38064.3	59.124

Source: author computation using GRETL

Annex 3: Simple OLS Regression

OLS, using observations 1981-2015 (T = 35)
Dependent variable: RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	72.7789	9.61135	7.5722	<0.0001	***
AID	7.65558	1.60107	4.7815	<0.0001	***
ExpEdu	9.95903	0.912563	10.9133	<0.0001	***
TO	2.56755	0.352922	7.2751	<0.0001	***
FDI	0.221593	0.105701	2.0964	0.0446	**

Mean dependent var	278.1765	S.D. dependent var	198.6514
Sum squared resid	8075.528	S.E. of regression	16.40684
R-squared	0.993981	Adjusted R-squared	0.993179
F(4, 30)	1238.598	P-value(F)	7.84e-33
Log-likelihood	−144.8846	Akaike criterion	299.7693
Schwarz criterion	307.5460	Hannan-Quinn	302.4538
rho	0.336485	Durbin-Watson	1.270182

Annex 4: Simple OLS Regression

OLS, using observations 1981-2015 (T = 35)
Dependent variable: RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	69.3607	8.65845	8.0107	<0.0001	***
AID	7.80741	1.43021	5.4589	<0.0001	***
ExpEdu	4.90146	1.90326	2.5753	0.0154	**
TO	1.60636	0.454009	3.5382	0.0014	***
RGCF	0.972713	0.330823	2.9403	0.0064	***
FDI	−0.108661	0.101877	−1.0666	0.2950	

Mean dependent var	278.1765	S.D. dependent var	198.6514

Sum squared resid	6220.977	S.E. of regression	14.64638
R-squared	0.995363	Adjusted R-squared	0.994564
F(5, 29)	1245.125	P-value(F)	6.75e-33
Log-likelihood	−140.3187	Akaike criterion	292.6374
Schwarz criterion	301.9695	Hannan-Quinn	295.8588
rho	0.359570	Durbin-Watson	1.250640

Annex 5: Simple OLS Regression

OLS, using observations 1981-2015 (T = 35)
Dependent variable: RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	97.9601	20.4621	4.7874	<0.0001	***
AID	22.5775	1.82681	12.3590	<0.0001	***
TO	1.18857	0.722682	1.6447	0.1101	
FDI	0.871893	0.0738235	11.8105	<0.0001	***

Mean dependent var	278.1765	S.D. dependent var	198.6514
Sum squared resid	40135.14	S.E. of regression	35.98169
R-squared	0.970087	Adjusted R-squared	0.967192
F(3, 31)	335.1106	P-value(F)	1.07e-23
Log-likelihood	−172.9444	Akaike criterion	353.8888
Schwarz criterion	360.1102	Hannan-Quinn	356.0364
rho	0.248128	Durbin-Watson	1.498240

Annex 6: Simple OLS Regression

OLS, using observations 1981-2015 (T = 35)
Dependent variable: l_RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	5.47066	0.182643	29.9528	<0.0001	***
l_AID	−0.031653	0.0326635	−0.9691	0.3403	
l_ExpEdu	0.430028	0.0263266	16.3344	<0.0001	***
l_TO	0.118116	0.0547429	2.1576	0.0391	**
l_FDI	0.0146204	0.00731942	1.9975	0.0549	*

Mean dependent var	5.427894	S.D. dependent var	0.611020
Sum squared resid	0.121484	S.E. of regression	0.063635
R-squared	0.990430	Adjusted R-squared	0.989154
F(4, 30)	776.1702	P-value(F)	8.21e-30
Log-likelihood	49.44530	Akaike criterion	−88.89059
Schwarz criterion	−81.11385	Hannan-Quinn	−86.20606
rho	0.509572	Durbin-Watson	0.966618

Annex 7: Simple OLS Regression

OLS, using observations 1981-2015 (T = 35)
Annex: Error correction Model
Dependent variable: d_l_RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
d_l_AID_1	0.0382625	0.0227232	1.6839	0.1037	**
d_l_ExpEdu_1	0.10769	0.0822738	1.3089	0.2016	
d_l_TO_1	0.164153	0.0652965	2.5140	0.0182	**
d_l_FDI_1	0.00573282	0.00591371	0.9694	0.3409	**
ECM_1	−0.539716	0.178382	−3.0256	0.0054	***
d_l_RGDP_1	0.543483	0.17722	3.0667	0.0049	***

Mean dependent var	0.056160	S.D. dependent var	0.061670
Sum squared resid	0.062817	S.E. of regression	0.048234
R-squared	0.721782	Adjusted R-squared	0.670260
F(6, 27)	11.67438	P-value(F)	1.95e-06
Log-likelihood	56.53160	Akaike criterion	−101.0632
Schwarz criterion	−92.08415	Hannan-Quinn	−98.04202
rho	−0.178221	Durbin-Watson	2.319969

Annex 8: 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_l_RGDP

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
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_l_AID

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
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_l_ExpEdu

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
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_l_TO

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
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_l_FDI

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
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