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The Impact of Trade Openness for the Economic Growth of Ethiopia

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Abstract

The fundamental objective of this empirical research paper is to investigate the impacts of trade openness for the economic growth of Ethiopia using time series data from 1981-2017. We used an instrumental variable estimation method of the two-stage least squares (2SLS) to resolve econometric challenges related to endogenous explanatory variable bias. The logarithm form of total GDP as a proxy to economic growth is taken as a dependent variable and trade openness, foreign direct investment share of GDP, the logarithm form of total fixed capital formation share of GDP, the rate of school enrolment as a proxy for human capital, and logarithm form of economically active population are used as explanatory variables. The empirical estimation result implies that there is a negative and significant effect of trade openness for the total GDP of Ethiopia. The findings of this research paper also indicated that the log of fixed capital formation, human capital, and economically active population have positive and significant effects on the total GDP of Ethiopia, while foreign direct investment has negative effects.

Keywords: Trade openness; Economic growth; Ethiopia

Introduction

The impact of trade openness on the economic growth of countries has remained a key subject for different economic scholars and debates in research and policy dialogues. Although a lot of researchers discussed the patterns of trade can be influenced by the economic growth of countries, still, there is no clear evidence and agreement among researchers about the impacts of trade openness for economic growths. Some researchers agreed to establish arguments that countries with the higher openness of trade lead to meet a fast and stable growth than the closed economies [1-3]. On the other side, other researchers have found that more trade openness can avert economic growth of a nation because of the destructive effects on infant industries and it may result in balance-of-payments constraint and shortage of foreign exchanges mostly in the least developing countries [3,4]. The benefits from trade openness have both supporters and opponents one side of the debate is regarding the prosperity effects from trade defended by a known researcher called Van den Berg et al. [5,6]. They viewed the benefits from trade is not only associated with comparative advantages derived from static trade gains but also it includes dynamic gains of trade. Researchers such as Suranovic, Van den Berg and Lewer [5,7] propose that the main gain's and benefits of trade comes from dynamic gains continuing from the progressive effects of trade through technology transfer and economies of scale for the economic growth of countries. Moreover, the openness of trade for the economic growth of countries has been discussed on two opposing views. The first argument emphasized based on the historical evidence on the industrialization processes of different countries development history which passes through selective trade protectionism policies for a short time and after the domestic industries reached a certain level of growth they follow implementing trade liberalization policies. This argument, strengthened by Prebisch, supporting selective trade protection policies for protecting infant industries, and he concludes full trade openness can encourage unequal trade benefit distributions and deindustrialization in developing and least developed countries. Moreover, historical evidence during the colonial era implies that forced liberalization of trade imposed on the least developed countries results in the deindustrialization of the domestic industries and under development. The second view discussed in favor of trade openness policy that can improve the efficiency of domestic industries productivity related to production factors allocation that can create exposure to foreign competition and foreign technology adaptation in the domestic production processes. In the recent trade and growth theories, the latter observations have become more convincing and influential with different strong theoretical arguments about trade openness can increase the growth of the economy of countries through different channels of trade. Although enormous empirical researches are done about the effects of trade openness on the economic growth of countries, most of them are mainly focused on developed and developing countries. Unfortunately, most of the least developing countries have not actively participated in the international trade system, which leads to their economies have not much benefited from trade as it could have been. Literature that investigated the impacts of trade openness for the economic growth of Ethiopia is very limited only discussed the impacts of exports on the economic growth of Ethiopia without covering the total effects of trade openness (total export plus imports divided by total GDP) on the economic growth of Ethiopia. Conducting empirical research on the impacts of trade openness for the economic growth of a nation like Ethiopia will have great importance in the recent globalized era for helping policymakers to prepare and implement suitable policies by determining the key sources of economic growth. This study will contribute a better understanding and policy formulation guidances for policymakers of Ethiopia on the importance of trade openness for the GDP growth. It can also be a differentiating research paper for indicating how a latecomer catches up with forerunners by growing its trade participation in the international market. The main purpose of this research paper is to discuss and analyze critically the impacts of trade openness on the growth of the Ethiopian economy, which is an essential aspect of different theory development especially related to developing and least developed countries. This research paper can contribute additional theoretical literature specifically in Ethiopian cases, and it will also contribute to supporting theories in

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the study of least developed countries. Moreover, this study can also have empirical contributions related to trade openness and economic growth measurement issues by using appropriate and consistent estimation techniques using instrumental variables of Two-Stage Least Squares (2SLS). Using instrumental variable estimation system is an important method to avoid most of the previous studies common shortcomings of endogenous explanatory variable estimation bias and it can avoid estimation errors related to omitted variables by using a proxy explanatory variable. Different points are sought to be found out with a deeper understanding of how did trade openness can affect the economic growth of Ethiopia? And how changing gross fixed capital formation, foreign direct investment, trade openness, school enrollment rate as a proxy variable for human development, and economically active population are an important factor in the structure of the Ethiopian economy. This research paper is also discussed and supports the literature by creating more understandings about the international trade patterns of Ethiopia from several perspectives.

Trade Openness and Economic Growth Performance of Ethiopia

The Ethiopian economy has been growing very fast since 1992 massive policy reforms that opened the country to the rest of the world, which results mainly in the growth of foreign direct investment and international trade of the country. After 1992 the Ethiopian government implemented a diversity of reforms to improve the country's macroeconomic stability, to facilitate its economic growth and reducing poverty. Some of the measures taken by the Ethiopian governments are a high amount of tariff and quota reductions, implementation of simple and fast licensing procedures, less government control in foreign exchange, a high privatization policy strategies and soon. The implementation of enormous policy reforms in 1992 results in more open of global trade policy with increased import and export of goods and services and increasing the country's foreign direct investment inflows. To achieve its development objectives the country is required for adjustments in trade policies and technological adaptations to be benefited from trade gains with more trade liberalization. After the government implemented its growth transformation plan to the country's developmental tasks the country achieved a high and continuous economic growth rate with average real GDP growth of 10.4% from 2003 to 2011 that makes the country among the fast-growing economies in Sub-Saharan Africa. According to the National Bank of Ethiopia report from 1992-1995 Ethiopia was achieved a record high growth rate in both export and import sectors of the country, because of the government's implementation of economic reform in opening of international trade in both export and import sectors, devaluation of exchange rate, and different structural adjustment program of the World Bank. However, the Ethiopian economy especially it's export sector is mostly subject to fluctuations related to the international market price fluctuation in agricultural commodity because of the country's export sector dependency mainly on the agricultural sector. Although, there was some decline in the economic growth of Ethiopia the government of Ethiopia compensates by taking an effective measure by the implementation of timely policies to tackle the problems. The GDP growth of Ethiopia is supported by increasing growth in the service sector with slightly industry sectors growth and the agricultural sector contribution to GDP is declining, though it contributes to the higher share in absolute term. According to the Ethiopian government economic policy report with a continuation from the previous long term policies implemented by Ethiopia, the country has currently under the implementation of a five years plan which is called Growth Transformation Plan (GTP-II) as a means that paves the way to secure the medium income level in the next ten years (Figure 1).

According to Ethiopian government data sources in 2006, the Economy of Ethiopia is highly dependent on agriculture which accounts about 47% of GDP, while industry accounts 13% and services account for 39% of the country's GDP. After frequent economic liberalization process the share of merchandise trade from Ethiopian total GDP increases from 11.4% in 1990 to 42.1% in 2006 from which export constitutes 16% of GDP and import constitutes about 42% of GDP. The export sector of Ethiopia has been growing with an average rate of 7% yearly from 1981-2008 for merchandise exports and manufacturing exports growth was 4% yearly in the same period. The Ethiopian trade balance is also similar to most developing countries trade balance with less amount of export and high amount of imports makes the country in

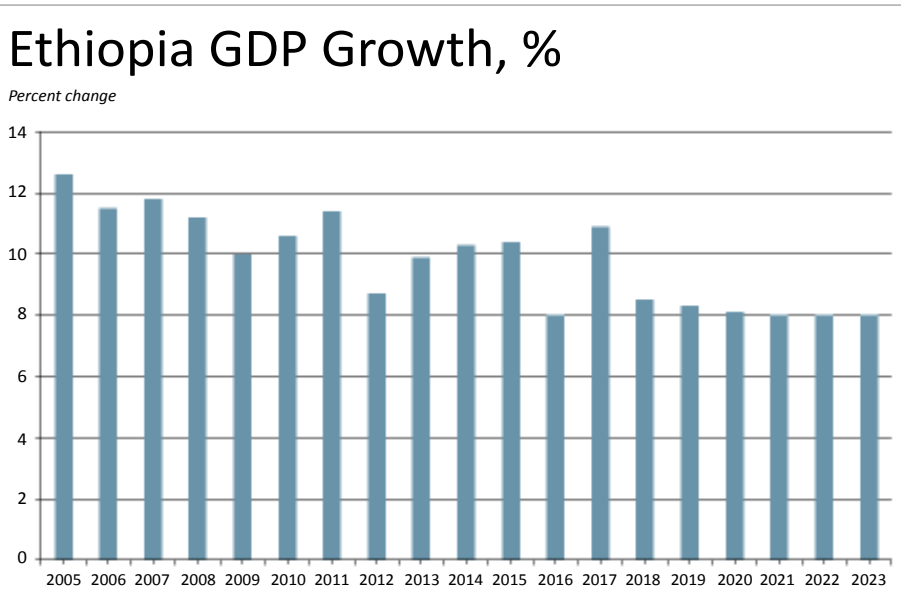

Figure 1: GDP Growth rate projection of ethiopia by world economic overview.

the trade deficit for the last decades. Although Ethiopia did a significant improvement in opening its trade to the international world its trade openness index is still low compared to other developing countries and this suggests that the country needs for more trade openness to the global world (Table 1).

Literature Review

International trade and growth theories

Based on different kinds of literature describing the connection between international trade and economic growth there are numerous channels through which international trade can affect economic growth particularly through specialization, utilization large global market, ideas and new technological and transfer and other related benefits of openness of trade. The new theories of economic growth presented substantial support that trade openness has a progressive effect on the economic growth of a nation [8-12]. They were also discussed that countries with highly open to international trade will gain more with the higher ability to absorb advanced technologies from developed countries. However, some authors like Krugman opponent of trade liberalization, have emphasized that the outcome of international trade on economic growth is sometimes ambiguous with different situations [8,13,14]. From the comprehensive literature, the gains from international trade for the economic growth of countries can be both static and dynamic gains. The static gains of trade are from the domestic output production improvement and the gains from national welfare. International trade offers a new opportunity for a domestic consumer to buy low-priced imported goods and manufacturers can export goods at higher overseas prices. The dynamic trade theory mainly emphases on dynamic gains of trade that are initiated by an augmented buildup of physical capital and human capital, which can arise because of high rates of reserves and improved technological handover [5,15-19]. The dynamic gains of trade openness are from different channels such as through higher investment inflows from abroad and improvements in the domestic production sectors from knowledge and experience sharing's and economies of scales from large productions, and other human and physical indirect dynamic gains of trade openness from managerial knowledge and skill transfers through the expansion of additional business segments [20,21]. The new trade and growth theory discusses other sources of trade benefits related to the differences in relative advantages and positive externalities of trade, which can deliver transitional and long term gains of trade. The Solow growth model is not enough in explaining the changes in technology and its forecasts in final convergence to zero per capita growth of steady state but the endogenous growth theory identifies the advancement in technology and new creativity and innovations are also included in the structure of economic growths theory [12,16,17,22,23]. The endogenous trade concept delivers a noble basis for explaining the connection between trade and growth with the assumption of no diminishing returns to capital appropriate trade openness strategies can stimulate long-run economic growth by changing saving and investment rates and the accumulation of capital [24]. Physical investment and human capital accumulation related to positive externalities of trade related to the accumulation of capital can allow a stable rises in output growths stimulated by trade openness policies [8-10,12,25,26]. Economic growth policies supported by research and development will create a continuous improvement of growth and it can also enhance innovations and its competitive capacity to increase the productivity of domestic sectors. International trade is an opportunity for the achievement of foreign investment flows and imported intermediary goods and services are important for the domestic economic development of a nation. Generally, the effect of trade policies and international trade for the growth progression of a nation can emerge from a diversified channel which can work directly or indirectly to support the economic growth process of a nation. Enhancements in the government macroeconomic policy and the upgrading of domestic institutions are some of the indirect channels of trade to growth [23,26-30]. For instance, institutional transformations determine business operation costs subject to the simplicity of trading and businesses operations and in what way trade policies are established and discussed such as governmental, logistics service, custom, and border procedures can increase inefficiencies and trading costs among nations. Wacziarg found a supporting evidences of trade openness for its positive effect on the economic growth of countries by identifying the dynamic gains or losses of trade through trade channels such as macroeconomic policy and scope of governments role, through resource allocation, distributions and factor accumulations, and technology transfer mostly through trade and foreign direct investment inflows from abroad [17,28,31]. Moreover, the interface between international trade and growth hypothesis can be found in two directions one when international trade spurs economic growth and the other is when in turn economic growth enhances international trade. This research paper uses to test the direct impacts of international trade on the economic growth of Ethiopia by using the Two-Stage Least Square empirical testing methods.

Empirical evidence on trade openness and economic growth

Over the past decades, a lot of researchers supported the argument

Year	Indicators						
	Economic Growth in percentage	Export Value in Billion ETB.	Growth	Import Value in Billion ETB.	Growth	Trade Balance in Billion ETB.	Trade Openness, Percentage of GDP
2006	11.43	43.12	-	108.7	-	-65.58	45.19
2007	10.75	42.88	-0.57	115.93	6.65	-73.05	42.69
2008	8.69	42.97	0.22	117.43	1.3	-74.46	39.67
2009	12.66	62.72	45.96	151.87	29.32	-89.15	47.11
2010	13.07	85.95	37.04	162.49	6.99	-76.54	48.23
2011	8.65	77.04	-10.36	177.01	8.94	-99.97	45.4
2012	10.58	77.26	0.28	179.39	1.34	-102.1	41.47
2013	10.26	79.44	2.82	198.56	10.69	-119.1	40.74
2014	10.39	70.53	-11.22	228.17	14.91	-157.7	39.66
2015	7.34	64.74	-8.2	224.62	-1.56	-159.9	35.79
Average	10.38	64.66	6.22	166.42	7.86	-101.75	42.6

Source: Our Own Illustration Based on the National Bank of Ethiopia (NBE) Data.

Table 1: Export and Import of Ethiopia from 2006 -2015 in Billions of Ethiopian Birr (ETB.).

that trade openness has been contributing for the economic growth of countries, and others argued that trade openness may affect the domestic industries negatively especially in the least developing countries. The development level of countries, market imperfection, resources endowment, and technology differences may lead to different effects of trade openness for the growth of the economy. On the other hand, the result of trade-growth linkage can be affected by the use of different measurement techniques and applied empirical estimation methods. Researchers investigated on the outward and inward growth strategies found that the outward-oriented economies can accomplish definitely higher fast growth than inward-oriented economies, [22,32]. The research studied on 93 developed and developing countries from 1960 to 1990 suggesting that countries with more open to international trade are experienced faster productivity growths [1,33-35]. Different researches on developed and developing countries result in attesting a robust positive linkage of trade openness and growth [18,36]. However, in general, trade openness has benefits to countries, some authors have found out that trade openness undermines economic development in developing countries [37-39]. Since 1980 the benefits of trade to economic growth has increased more for the developed countries than least developed and developing countries. In support of the previous authors, Bongsha et al. investigated that premature trade liberalization in sub-Saharan Africa (SSA) has weakened the SSA nation's economic development because of technology competitiveness weaknesses in most sectors of these countries compared to developed countries [7]. Furthermore, Huchet-Bourdon have investigated that countries with high exports diversification are benefited more in economic growth rise rapidly and countries with low export diversification have got lower benefits from trade openness, [34,40]. To sum up, from different kinds of literature point of view trade openness is beneficial to countries economic growth in general and countries with low competitive productivity ability are not competitive enough to take advantages in improving from market access. Researches in six African countries about the effect of trade protection shows that trade protection improves the price of agricultural products traded by domestic producers and the removal of agricultural trade protection results are relatively benefiting the rich than poor farmers, [16,41]. Another empirical research done in Kenya by Were, found the negative impacts of trade openness on the economic growth of Kenya [16]. Another study in Sub-Saharan African countries by Were, Ahmed and Suardi discussed trade openness is linked to consumption and production growth volatility [16]. In addition to the direct effects of trade openness on the economic growth of Sub Saharan African countries the research also explored other different channels on which trade can affect economic growth mainly through local investment and the inflow of foreign direct investment are becoming increasingly critical for economic growth. The existing economic and trade literature and experimental investigations have been mainly emphasized on the higher income level developed and developing nations. However, these theoretical and empirical investigations' didn't give much attention to underdeveloped countries mainly in Sub-Saharan African countries including Ethiopia. Empirical researches about the linkage between trade openness and economic growth in Ethiopia are very few only focused on the impacts of export on the economic growth of the country. This research paper will contribute additional theoretical and empirical evidence about the impacts of trade openness on the growth of Ethiopian economy in particular and it will also give additional theoretical and empirical inputs for further studies in the least developed countries.

Model, Data, and Methodology

Research data

The data for this study covers all of the variables that are included in this research paper over the period 1981-2017 time series data for the determination of trade openness to the GDP growth of Ethiopia. The variables included in this empirical research regression study are economic growth proxies by total GDP (Ln GDP), Capital formation proxied by Gross fixed capital formation (Ln GCF), Labor force participation rate proxied by economically active population from the age of 15-64 years old (Ln ACTPOP), the net inflow of foreign direct investment share of GDP (FDIGDP), human capital proxied by middle school enrolment rate and Trade openness (export plus import divided by total GDP) as (CTOP). The main sources of the data are from the database of 'World Bank Data Base - World Development Indicators' for current GDP per capita, gross fixed capital formation, trade openness (total export and import divided by total GDP), school enrolment rate, and economically active population. The data sources for the net inflow of foreign direct investment are from UNCTAD databases.

Research model

This research paper used an improved form of the Solow growth model which is applied by Mankiw et al. and others in which total GDP is used as a dependent variable as proxy for economic growth and trade openness (total export plus total import divided by total GDP), gross fixed capital, school enrolment rate as a proxy for human capital, foreign direct investment share of GDP, and economically active populations from the age of 15-16 years old as a proxy for labor force participation rate are used as an explanatory variable. The following model is used in this research paper based on the augmented Solow growth model as follows:

$$ln(GDP)_t=\beta_0+\beta_1\,(Trade\ Openness)_t+\beta_2\ ln\,(Gross\ Fixed\ Capital\ Formation)_t+$$
$$\beta_{3ln}(Active\ Population)_t+\beta_4\,\text{School Enrolment rate}+\beta_5(Foreign\ Direct\ Investment\ Share\ of\ GDP)_t+\varepsilon_t,$$

Where Ln $(GDP)_t$ refers to the natural logarithm form of total GDP of Ethiopia, β_0 is a constant term and $_1, \beta_2, \beta_3, \beta_4$, and β_5 are coefficients of explanatory variables, $(Trade\ Openness)_t$ refers to total export plus total import divided by total GDP at time t, Ln $(Gross\ fixed\ capital\ Formation)_t$ refers to the natural logarithm form of gross fixed capital formation at time t, $(School\ Enrolment\ rate)_t$ as a proxy for human capital at time t, (Foreign direct investment share of GDP) a share of foreign direct investment to GDP at time t, and Ln $(Active\ Population)_t$ refers to economically active populations from the age of 15-16 years old as a proxy for labor force participation rate are used as an explanatory variable, ε_t is the error term. Trade openness (TOP) is calculated as the sum of total export plus total import divided by total GDP of Ethiopia. The impacts of trade openness on the economic growth of countries can be positive or negative depending on each countries specific conditions of development status, trade, macroeconomic policies, and other social and political factors. Some researchers found positive trade openness effects on economic growths and others did not find a robust effect of trade on growth [40,42].

The accumulation of fixed capital formation is one of the determinants of economic growth through know-how transfer from foreign investments accumulation. The fixed capital formation which is proxied as the natural logarithm form of gross fixed capital formation (Ln GCF) is expected to a positive impact on the economic growth, as a large number of existing empirical literature support positive effects on economic growth. For the representative of the labor force participation rate as an explanatory variable in our model, we used an economically

active population (Ln ACTPOP) from the age of 15-64 years old and its expected effect can be positive or negative depending on each countries domestic economic development status and economic opportunities for absorbing the economically active populations on the economic development process of each country. According to Hotchkiss, JL on his empirical research discussed that the potential economic growth of countries can be determined by its labor force participation on the developmental processes of that country [43]. The effect of foreign direct investment on the economic growth of countries is also included as a net inflow of foreign direct investment share of total GDP.

Methodology

This research paper used an instrumental variable econometric method of the Two-Stage Least Square (2SLS) estimation system which can work within time-series and panel data types. These estimators are normally applied to avoid endogenous explanatory variable bias using the lagged values of endogenous explanatory variables as an instrumental variable and it can also resolve omitted variable errors by using proxy explanatory variables. The endogenous variable bias and omitted variable estimation errors are usually a common empirical estimation problem in ordinary least squares and other similar estimation methods that can make these estimators inconsistence [44]. Empirical researches using the OLS methods are frequently exposed to a potential problem of endogenous variables estimation bias. In order to resolve the estimation errors and biased results caused by endogenous explanatory variables, the best solution is using an instrumental variable estimation method of two-stage least squares (2SLS), [19,45-50]. This instrumental method is a consistent estimation technique to resolve potential endogeneity problems of explanatory variables by using the lagged values of endogenous variables as an instrumental variable. Using the instrumental variable estimation technique proposed by Arellano and Bond are a suitable method to avoid estimation bias and errors related to endogeneity problems in the growth models [43]. Using the instrumental variable estimation techniques of Two-Stage Least Square (2SLS) have additional advantages than other instrumental variable estimation techniques because these methods can be used instrument variables using the lagged values of endogenous explanatory variables. The consistency and validity of the 2SLS estimators rely on the applied instrumental variables validity (uncorrelated with the error terms) using Sargan and Hansen over identification restriction tests, endogeneity tests and nonexistence AR2 residuals should be tested using the usual requirement tests by Arellano and Bond for AR1 and AR2. The time series data needs considering the time series properties of a data because of its non-random behavior if it is applied directly the effectiveness of the applied econometric model will be affected. The use of non-stationary data on the econometric model may yield specious outcomes, so using a time series data needs a stationarity test for the variables. Using a time series data needs the stationarity tests of the variables, the serial correlation tests, and the heteroscedasticity tests are required to know about the variables stationary tests at the level or at its first differences and to know the model is not suffered from the serial correlation and heteroscedasticity problems. Using the Augmented Dickey-Fuller (ADF) testing method is a standard unit root testing technique with a null hypothesis HO: Variables have a unit root and the alternative hypothesis H1: Variables have no a unit root. If the Augmented Dickey-Fuller test t-statistics value is greater than the critical values or if the ADF unit root test probability value is better than 5% level of significance we will reject the null hypothesis and accept the alternative hypothesis of variables are stationary at the level or at first differences of the series [51-55].

Empirical Results and Analysis

This empirical research paper used the Two-Stage Least Square (2SLS) instrumental variable estimation technique, which is an appropriate and consistent empirical estimation method to avoid endogenous variable bias and possible omitted variable estimation errors. This empirical research paper uses the lagged values of endogenous variables as instrumental variables, which are valid with the restrictions on the preliminary conditions. This empirical study examined the impacts of trade openness on the growth of the Ethiopian economy using the Solow and Mankiw et al, growth model as a benchmark which explains total GDP of Ethiopia Ln (GDP) as a dependent variable and trade openness (TOP) as the main explanatory variable. Other explanatory variables such as the logarithm form of gross fixed capital formation (Ln GCF), net foreign direct investment share of GDP (FDIGDP), middle school enrolment rate as a proxy of human capital (SENRR), and labor force using a proxy variable of the natural logarithm form of economically active population from the age of 15-64 (Ln ACTPOP) are used. As we mentioned earlier, this research's main objective is to investigate the impacts of trade openness on the Ethiopian economic growth using a time series data from 1981 to 2017. The stationarity test of the variables is done using the Augmented Dick-Fuller (ADF) testing methods to retain the validity of the tests based on the white-noise errors in the model by confirming the errors are really white-noise. The ADF unit root test method is a standard method of testing unit roots to analyze the order of the variables of integration. The stationarity test results of the variables show that variables are stationary both at the level and at first differences using the ADF method and detail stationarity test result of each variable are done in the following Table 2.

Based on the empirical regression result using Two-stage least square methods attached in the following Table 3, the empirical regression result shows that trade openness has negative impacts on the total GDP growth of Ethiopia at 5% significant level, Dependent variable: Natural Logarithm form of GDP (Ln GDP) (Tables 3 and 4).

Based on our empirical result shown in Table 3 with the assumption of other variables are constant, a 1 unit increase in the rate

Variable	Intercept and Trend	Prob.	Intercept and Trend	Prob.
	At Level:		At First Difference:	
	t-statistics value		t-statistics value	
Ln GDP	-1.71645	0.7057	-5.329877	0.0006*
LnGCF	-7.387258	0.0000*	-6.554794	0.0000*
FDIGDP	-4.006981	0.0198**	-7.22335	0.0000*
TOP	-89.71606	0.0000*	-7.015706	0.0000*
SENRR	-4.685766	0.0041*	-3.369195	0.0721***
LNACTPOP	-3.596066	0.0461**	-3.450475	0.0636***
Note: *, **, and *** represents variables are stationary at 1%, 5%, and 10% level of significance.				

Table 2: ADF Stationarity of Variables Test Result.

Variable	Coefficient	Std. Error	t-statistic	Prob.
Ln GCF	0.67877	0.140202	4.84139	0
FDIGDP	-5.07821	2.880019	-1.76325	0.0877
TOP	-3.40915	1.495624	-2.27941	0.0297
SENRR	0.01113	0.006233	1.785793	0.0839
Ln ACTPOP	0.521146	0.168549	3.091954	0.0042
Endogeneity test (J-Stats) and prob. (Ho: variables are Exogenous) Decision: Reject Ho and, Accept H1: Variables are endogenous			21.886	0.0005
Instrument Orthogonality (Validity) C Test (HO: Instruments are Valid) Decision: Accept Ho all instruments are valid				
HO: No Serial Correlations Decision: HO is Accepted			1.321	0.5166
HO: Homoscedasticity Decision: Accept HO			1.5142	0.2151
HO: Normality Test (Jarque - Bera) test Accept Ho: The model is normally distributed			1.39442	0.49797
R-Squared	0.9442			
Adjusted R-Squared	0.937			
Number of observations	36			
Number of Instruments	7			
Note: The coefficient values of the explanatory variables and its significance level are found in the table and Instrument lists are Ln GDP (-1), Ln GCF (-1), FDIGDP (-1),Ln ACTPOP (-1), TOP (-1) and Constant (C).				

Source: Own Illustration using E-Views 10.

Table 3: Regression Result Using Two-Stage Least Square (2SLS) Methods.

Instrument Variable	Null Hypothesis (HO): Instruments are valid	J-Stat	Prob.	Decision
Ln GDP (-1)	HO: LnGDP (-1) are valid instrument	1.568318	0.211	Accept HO
Ln GCF (-1)	HO: Ln GCF (-1) are valid instrument	1.562672	0.2113	Accept HO
DIGDP (-1)	HO: FDIGDP (-1) are valid instrument	0.151483	0.6971	Accept HO
TOP (-1)	HO: TOP (-1) are valid instrument	0.069934	0.7914	Accept HO
SENRR (-1)	HO: SENRR (-1) are valid instrument	1.165673	0.2803	Accept HO
Ln ACTPOP (-1)	HO: Ln ACTPOP (-1) are valid instruments	1.680863	0.1948	Accept HO

Source: Own Illustration using E-views 10.

Table 4: Instrument Orthogonality Test (Validity Test) Results in 2SLS Estimation Techniques.

of trade openness results in a 3.41% decreases in total GDP of Ethiopia using 2SLS methods at 5% significant level. The result shows that the openness of trade has a negative effect on the total GDP of Ethiopia. Some researchers argue that countries like Ethiopia which depends on producing and exporting primary products relatively low-priced products may face a negative trade balance. The trade data of Ethiopia shows that there is continuous growth and a large amount of imports compared to its exports which can be a cause of a negative trade openness effects on the growth of total GDP because of a large amount of negative trade balances in the country. Based on our empirical research results, physical capital formation proxied by fixed capital formation has a positive effect on the total GDP of Ethiopia which proved the economic theories and the previous empirical literature that implied fixed capital formation plays a predominant role for the economic growth of countries. Assuming other explanatory variables are constant, a 1% increase in fixed capital formation (Ln GCF) results in a 0.68% increase in the total GDP of Ethiopia at a 1% significance level. The Solow growth model also confirmed that the formation of capital can enhance and assist the economic growth of countries. Based on our research regression result using a two-stage least squares estimation technique the impacts of human capital using a proxy variable of middle school enrollment rate on the total GDP of Ethiopia is positive at 10% significance level. Assuming other explanatory variables are constant a 1 unit increase of middle school enrolment rate results a 0.011% increase in total GDP of Ethiopia. This result proved the endogenous trade and growth theory of the Solow growth model that argued the growth of human capital can increase the economic growth of countries through technology adaptation and through research and development capacity growths of countries. This study empirical result also implies that the effects of foreign direct investment net inflow share of GDP on the total GDP of Ethiopia is negative at a 10% significance level. Assuming other explanatory variables are constant a 1 unit increase in the foreign direct investment share of GDP, results in a 5.08% decrease in the total GDP of Ethiopia at a 10% level of significance. This empirical study regression result showed that there is a positive relationship between active labor force participation using a proxy variable of the economically active population from the age of 15-64 years old in log form (ln ACTPOP) and economic growth of Ethiopia using total GDP at 1% significant level. Assuming other determinant factors of total GDP is constant, a 1% increase in economically active population can increase the total GDP of Ethiopia by 0.52% at 1% level of significance. Based on these empirical research findings which are also supported by the Solow economic growth model and existing literature the Ethiopian economy can be benefitted by utilizing its large and relatively cheap labor force supply for stimulating its economic growth. Generally, the research findings implied that the main challenge is how the least developed countries like Ethiopia can position itself to earn the maximum benefits from the participation of international trade and the multilateral trading system. For improving benefits of trade openness for the Ethiopian economy, the main issue is not whether to trade or not, but how to improve its trade participation through creating a conducive institutional framework and a complimentary national trade, growth, and macroeconomic policies. The Ethiopian economy can increase its trade benefit by taking advantages of regional and global supply chains participation, through creating a conducive business environment, improving its logistics and

infrastructure system, stimulating human capital resource utilization, and implementing technological innovations. The serial correlation test result shows that there is no evidence of second-order serial correlation is detected confirming there is no serial correlation problem in the model. The LM test result of this model shows that there are no serial correlations in the model with a probability value of 43.96%. Endogeneity tests of the explanatory variables, (the Durbin-Wu-Hausman Test) are used for testing the some of the explanatory variables or all of explanatory variables endogeneity of the equation for the time series data estimated by 2SLS. To test the endogeneity of variables we run a secondary estimation which results with rejecting the null hypothesis H0: variables are Exogenous at 1% significant level and we accepted the alternative hypothesis H1: variables are endogenous. The validity of instruments or Instrument Orthogonality Tests are also done for all instrumental variables and the test result shows that all instrumental variables are valid. The test for heteroscedasticity is also done to test the heteroscedasticity specifications of residuals in the equation by using Breusch-Pagan-Godfrey test which results by accepting the null hypothesis H0: Homoscedasticity (no heteroscedasticity). The model is normal with a probability value of 49.80%. The value of R-square and adjusted R-square in this model is 94.42% and 93.70% which showed that the model is well explained [56-63].

Conclusion

The main objective of this empirical research paper is to investigate the impacts of trade openness for the total GDP growth of Ethiopia using annual time series data from 1981-2017. Based on the existing empirical economic literature, there is no concluding consensus on the trade and growth links. Empirical results about the effects of trade openness on the economic growth of countries are mixed across countries, depending on each countries specific conditions, the data used and applied estimation methods. In this empirical study Two-Stage, Least Squares (2SLS) estimation technique is used based on the existing literature suggestions to resolve endogenous variable estimation bias. This empirical research finds the negative impact of trade openness for total GDP of Ethiopia. The negative impact of trade openness in the growth of the Ethiopian economy implies that the country experiences a high amount of imports than its exports with a high negative net trade balance. To improve the benefits of global trade participation, Ethiopia should upgrade and improve the structure and patterns of its trade and growth policy towards more participation and growth encouragement actions. This empirical research result gives additional theoretical and empirical evidence about the effects of trade openness for the economic growth of Ethiopia. The negative effects of openness of trade for the economic growth of Ethiopia can be an indication of a supportive theoretical and empirical evidence to give more attention and further studies in similar least developed countries to find appropriate trade and growth policy corrections. The research findings proved the Solow growth model and growth theories of the positive effects of fixed capital formation on the economic growth of countries, confirming fixed capital formation can encourage the economic growth of Ethiopia. The outcome of our study shows that human capital using a proxy variable of middle school enrolment rate has positive effects on the total GDP of the country, which confirms the Solow growth model and the endogenous growth theory of human capital development can play a significant role in utilizing technology usages and through improving research and development. The study findings showed that the effects of net inflows of a foreign direct investment share of GDP on the total GDP of Ethiopia are negative. It implies that the Ethiopian economy needs more appropriate foreign direct investment policy improvements and other economic growth encouragement actions are needed to increase the benefits from foreign direct investments to the country's economy. This empirical study regression result also implies that there is a positive relationship between active labor force using economically active population from the age of 15-64 years old and economic growth of Ethiopia using total GDP. Based on this research result the Ethiopian economy can be benefited from its high number of economically active population to encourage its economic growth mainly using its high labor force resources. This research is primarily designed for studying the effects of trade openness on the total GDP of Ethiopia. This research paper result has important policy and theoretical implications about the impacts of trade openness on the total GDP of Ethiopia, which are also affected by other potential determinant factors of economic growth such as the domestic economy level of development, macroeconomic policy, and others. The policy implications from this empirical study result showed Ethiopia should improve its trade and macroeconomic policies to gain more benefits from trade openness for its economic growth through enlarged trade openness benefits and opportunities of the regional and the international market. To improve the benefits from trade for its economic growth the Ethiopian government should increase its trade opportunities in both the export and import sectors. Ethiopia can improve the benefit from trade by strengthening the domestic economy capacity of production efficiencies supported by a growth stimulating macroeconomic policies, by giving more emphasis on the domestic infrastructure and logistic developments, followed by appropriate trade and growth policies. Furthermore, Ethiopia should also improve its trade and growth policies to increase the benefits from trade and the country should consider the adoption of common regional and international trade cooperation policies in order to enhance its economic growth in the long run.

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