The Effect of Everything But Arms Trade Preference on the Exports of Ethiopia: Empirical Evidence Using Gravity Model

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Abstract

International trade is generally considered as an integral part of growth and development effort of an economy. Granting non-reciprocal trade preferences to developing countries has been a common practice by developed countries in their foreign trade policy. Many developing countries have also participated in reciprocal regional trade agreements. This study examined the effect of Everything-But-Arms trade preference on the exports of Ethiopia using bilateral export data with 34 major trade partners including the EU-15 over the period 2001-2019. The random effect model was used to estimate the generalized gravity model. The estimation results revealed that the EU non-reciprocal trade preference to the least developed countries, which is EBA dummy, has a negative and significant effect on the export performance of Ethiopia. The country's exports generally improve for a higher domestic production and trade partner's income, but decrease for a higher trade partners' population size, a longer geographic distance and common language sharing with trading partners. Thus, the country should work on easing domestic supply-side trade bottlenecks and promoting export diversification through auspicious investment climate for export-oriented value-added economic activities. This could help to ensure long-run global competitiveness and to effectively reap the trade opportunities of non-reciprocal trade preferences from developed economies, the EU in particular.

Key Words: export performance, trade preference, gravity model, Ethiopia, the EU
JEL Classification: F13, F14, F41

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1. Introduction

Economic integration and trade liberalization have been considered as the main deriving forces for the healthy growth of trade and economy since the creation of GAAT in 1948, following the ruin of World War-II. Growth and diversification of the export sector is crucial to ensure export stability, sustainable development, and self-sufficiency (Hesse, 2008). Free trade can be an optimal economic policy when it is implemented with complementary policies to address adverse interactions with market failures. But large countries may manipulate their terms of trade at the expense of their trade partners through an optimal tariff, which requires countries to enter into trade agreements to prevent mutually harmful trade protectionism (Rodrik, 2018). Accordingly, as part of liberalization, preferential market access agreements have become increasingly popular among the developed nations as tools to help poor countries. Non-reciprocal trade preference (NRTP) programs have been introduced by developed countries since 1960s to enable developing countries to benefit from international trade. As a major destination of goods from the Sub-Saharan Africa (SSA), the European Union (EU) has the most extensive network of one-way trade preferences than any WTO member (Borchert, Conconi, Ubaldo, & Herghelegiu, 2021). The EU introduced, inter alia, the Generalized System of Preferences (GSP) in 1971, nonreciprocal preferences to African-Caribbean-Pacific (ACP) countries in 1975, and 'Everything-But-Arms' (EBA) scheme in 2001.

The EBA scheme offers duty-free quota-free access to the EU market for all products, except arms, from Least Developed Countries (LDCs) including Ethiopia. Developing countries are expected to benefit more from export opportunities than aid, and market access agreements such as the EBA initiative are of potentially greater help to poverty reduction. Despite the unprecedented aid flows to the SSA, the traditional aid programs could have a harmful effect on institutional development in the region due to less accountability in the recipient country (Moss, Pettersson, & Walle, 2006). Annual aid to Africa actually represents only a fraction of what the continent loses because of unfair trade and investment practices by developed countries (Mold, 2005).

However, the trade impacts of preferential arrangements are left controversial and inconclusive even among pro-free trade economists. The EU's preferential arrangements, in particular, have no conspicuous positive impact on the trade performance of developing countries (Panagariya, 2002; Persson &

Wilhelmsson, 2013; Nicita & Seiermann, 2016). Due to the absence of proper internal policies for structural diversification, the trade preferences have been less successful in SSA (Mold, 2005). Unlike the East Asian economies, the SSA countries with extensive and deepest preferences failed to improve production growth and diversify their export bundles, and underused the NRTPs mainly due to administrative burdens and uncertainty about expiration of preferences (Zappile, 2011; Francois, Hoekman, & Manchin, 2006). One-way trade preference schemes, basically the EBA and AGOA, have not been effective in improving export growth and encouraging export diversification in SSA countries chiefly because of insufficient preference margin to surmount Africa's lack of competitiveness (Alves, Draper, & Khumalo, 2009). Given the deep integration of the EU itself, the LDCs such as Ethiopia cannot utilize the preference opportunities. Ironically, the destination of SSA countries' exports changing substantially, and forged with emerging markets mainly China regardless of the extensive EU preferences. Further, trade preferences may undermine internal policy reform by preference-receiving country to promote trade expansion and perhaps growth.

In general, even with massive NRTPs, Ethiopia's products remained less competitive in the global market. The country's balance of payments and trade balance have been incessantly in deficit partly because of strong relative import growth in imports of raw materials and capital goods for infrastructural development. Moreover, Ethiopia remained poverty-stricken, aid dependent and an exporter of few primary commodities for developed markets. Export diversification and structural transformation remains a major challenge, and like many SSA countries, the country's export sector is highly concentrated in few agricultural commodities, such as coffee and oilseeds, whose prices are volatile and exposed to global price swings.

This study, therefore, examined the impact of the EU preferential trade arrangements on the export performance of Ethiopia for two main reasons. First, the export share of Ethiopia in the markets of the preference giving countries, the EU in particular, has been deteriorating despite the full market access with deep preferences under the EBA scheme. Second, the country's external sector remains poorly diversified with incessant balance of payment difficulties that amplify the rising external debt. Understanding the effect of one-way trade preferences would have important policy implications to address domestic policy issues and structural problems in the external sector going forward.

The rest of the paper is organized as follows. The second section offers empirical reviews about the effect of various trade preferential arrangements on the export or trade performance of preference receiving countries. The third section presents the empirical model and data used, followed by the empirical results and discussions under section four. The last section concludes the study.

2. Empirical Reviews

The trade cooperation between the EU and SSA countries is traced back to the Yaounde convention-I, signed in 1963 between the EEC member states and eighteen African ex-colonies. The agreement had offered duty free access to specified goods from the signed SSA countries into the EU market, and lasted until 1975 when succeeded by Lome Convention that was first signed between nine EC members and 46 African, Carribean and Pacific (ACP) countries. The EU granted one-way trade preferences to all developing countries through the introduction of the GSP in 1971, with reduced tariffs or perfectly duty-free access depending on product sensitivity. The EBA scheme was also introduced in 2001, which offers unconditional duty-free quota-free access to the EU market for all products, except armaments, from eligible LDCs including Ethiopia (Francois, Hoekman, & Manchin, 2006). However, the impact of such non-reciprocal preferences in terms of enhancing trade and then welfare of preference receiving countries remain ambiguous and left empirically inconclusive.

Many empirical studies indicated that non-reciprocal trade preferences may help to improve export performance of preference receiving developing countries (Klasen, Martínez-Zarzoso, Nowak-Lehmann, & Bruckner, 2021; Aiello & Demaria, 2010; Frazer & Biesebroeck, 2010; Agostino, Aiello, & Cardamone, 2007; Cernat, Laird, Monge-Roffarello, & Turrini, 2003). The official designation of the preference beneficiary countries as a LDC is associated with higher aggregated exports particularly for LDCs exporting agricultural and light manufacturing goods. But individual trade preference regimes are not always beneficial in terms of increased export values. The impacts vary depending on the preference offering country and the sector of exports considered (Klasen, Martínez-Zarzoso, Nowak-Lehmann, & Bruckner, 2021). Aiello and Demaria (2010) also examined the impact of GSP on the exports of 169 developing nations to the EU markets over the period of 2001 – 2004, and the

results revealed that GSP positively affects the agricultural exports from preferred countries.

Despite the general transaction cost challenges in African countries, the empirical results of Frazer and Biesebroeck (2010) indicated that AGOA had a significant positive impact on African exports of apparel as well as agricultural and manufactured products under AGOA product list. The result also showed that AGOA exports were not merely diverted from other destinations including the European countries. The results of Agostino et al. (2007) also showed the effect of NRTPs of eight major OECD countries to exports from developing nations over the period 1995 – 2003 using different levels of data aggregation (total exports, total agricultural exports and 2-digit). The findings confirmed that the NRTPs have positive impact on exports of developing countries regardless of the estimators used. The gain from preferences is found to be very high in many 2-digit sectors for all preferential treatments while the preference gain may place at lower values when total exports are considered. By analysing the worldwide distribution of gains and losses of the EU's EBA initiative for LDCs using a general and partial equilibrium simulations, Cernat et al. (2003) exhibited the existence of moderate welfare and trade gains from the EBA initiative. The largest gains recorded for Sub-Saharan Africa while the effect on the EU itself is minimal.

However, various other studies (Gil-Pareja, Llorca-Vivero, & Martı´nez-Serrano, 2019; Nicita & Seiermann, 2016; Persson & Wilhelmsson, 2013; Zappile, 2011; Gradeva & Martínez-Zarzoso, 2009; Ozden & Reinhardt, 2005; Alam, 2010) confirmed that trade preferences of developed countries may not improve the exports of the preferred low income countries. Using the Poisson Pseudo-Maximum Likelihood (PPML) estimator on a panel of 182 countries over the period 1960 – 2016, Gil-Pareja et al. (2019) generally suggested that only reciprocal trade agreements between developed and developing countries would have a positive impact on trade flows when the exporter is the developing country. The results also showed that developing countries should abandon their reliance on non-reciprocal trade preferences in favour of two-way agreements. The results of Nicita and Seiermann (2016) generally indicated that tariff preferences would produce marginal effects only for a limited number of LDCs so that tariff preferences alone are not sufficient to improve market access for LDCs. Since G20 countries have ample room to enlarge and strengthen preferential schemes to LDCs, they should review factors that may limit the effectiveness of

preferential schemes towards LDCs. This may also include eligibility criteria, rules of origin, product coverage and exemptions and administrative costs. Using the data over the period 1962 – 2007, Persson and Wilhelmsson (2013) suggested that the EU's NRTPs have negative effect on the export diversification of ACP countries as they were specialized in fewer primary goods. But the preferences have no significant effect on Mediterranean countries. Gradeva and Martínez-Zarzoso (2009) also examined the effect of the EBA initiative on the exports of ACP LDCs to the EU-15, and the results revealed a very poor performance of the EBA regime on the exports of LDCs. The EBA scheme seems to have exactly the opposite effects of its goal in LDCs as the policy actually reduces exports into the EU market.

Indeed, regional trade agreements may increase trade flows even higher than the non-reciprocal EU-ACP PTAs. The bilateral trade between two Free Trade Agreement (FTA) member countries would double on average after ten years (Baier & Bergstrand, 2007). Developing countries removed from GSP eligibility adopt more liberal trade policy than those remain eligible. Developing countries are found to reap more trade benefits from full integration into the reciprocity-based trade regimes rather than GSP style preferences (Ozden & Reinhardt, 2005). Likewise, eligibility for AGOA textile benefits has no significant effect on the SSA's trade due to poor preference exploitation capacity of African countries, uncertainty about preference expiration, and eroding preferential margins (Zappile, 2011). Thus, the regional markets could be seen as a "nursery market" where the member countries could learn to improve efficiency and competitiveness so that they could favourably compete within the global trading system (Turkson, 2012). Using fixed effect model on panel data, the results of Alam (2010) also revealed that the SAFTA and PTAs with China and Iran would improve export performance while the bilateral PTAs with Sri Lanka and Mauritius have no evidence to affect export performance of Pakistan.

In general, due to indistinct characteristics of preference of receiving countries, the issue of non-reciprocal trade preference has no unanimous answer and yet remains open for further research and policy discussion. The exports of LDCs under the EBA scheme remain very limited and still represent only a diminutive share of EU imports. Despite the duty-free quota-free advantage, products from LDCs have not experienced significant export flows towards the EU market. This may be due to inadequate domestic production potential and poor competitive position of LDCs even with other exporters those do not benefit

from any tariff advantages. Thus, it is plausible to examine the effect of EU preferences, EBA in particular, on the export performance of Ethiopia.

3. Econometric Model and Data

3.1 Econometric Model

The gravity model was used to examine the effect of EBA on Ethiopia's exports. The use of gravity equation to explain determinants of international trade flows is traced back to the pioneering work of Tinbergen (1962), which is analogous with Newton's universal law of gravitation. The bilateral trade flows between two countries ($X_{i.j}$) is directly proportional to the gross national products of those countries (Y) and inversely proportional to the distance (D) between them. Thus, the standard gravity equation is typically given as:

$$X_{ij} = \frac{(Y_i)^{\alpha}(Y_j)^{\beta}}{(D_{ij})^{\theta}} \qquad (\mathbf{1})$$

This gravity equation has exhibited considerable empirical robustness and explanatory power to describe trade flows with formal theoretical foundation since 1979 (Anderson, 1979; Bergstrand, 1985), which is commonly expressed as:

$$X_{ij} = \beta_0 (Y_i)^{\beta_1} (Y_j)^{\beta_2} (D_{ij})^{\beta_3} (A_{ij})^{\beta_4} u_{ij} \qquad \mathbf{(2)}$$

Where, X_{ij} is the export flow from country *i* to country *j*; Y_i and Y_j are nominal GDP of the country *i* and *j*; D_{ij} is the distance from the economic centre of country *i* to *j*; A_{ij} is all other factors that either support or hinder trade between *i* and *j* such as bilateral real exchange rate (RER_{ij}), domestic population size (N_i), partner country population size (N_j), common language ($LANG_{ij}$), border (BOR_{ij}), and preferential trade arrangements; and u_{ij} is a log-normally error term.

The gravity specification can be applied to explain the effects of free trade agreements on trade flows (Baier & Bergstrand, 2007). Thus, to empirically examine the effect of the EBA's trade preference on the exports of Ethiopia, the generalized gravity model in equation (2) above is presented in a log-linearized form by including bilateral real exchange rate, population size and dummies for

common language, border, and preferential trade arrangements for country pair *(i, j)* at time *t* as follows:

$$lnX_{ijt} = \alpha + \beta_1 lnY_{it} + \beta_2 lnY_{jt} + \beta_3 lnN_{jt} + \beta_4 lnD_{ij} + \beta_4 lnRER_{ij} + \gamma_1 EBA_{ij} + \gamma_2 LANG_{ij} + \gamma_3 BOR_{ij} + \varepsilon_{ijt} \quad (\mathbf{3})$$

The bilateral export flow of Ethiopia, the dependent variable, is proxied as the aggregated total bilateral exports in U.S dollars to its partners. The income variable is the nominal GDP in U.S dollars for Ethiopia and trade partners. The income (GDP) represents both the productive and consumption capacity of trading partners that significantly affects the trade flows among them. Trade can be created from economies of scale when the partner countries are large and of similar economic size, and from comparative advantage if a significant difference in factor endowment exists (Leamer, 1995). As high-income consumers tend to consume larger budget shares of capital-intensive goods, high income countries produce disproportionate amounts of capital-intensive goods and trade more than average with each other and less than average with low-income labor-abundant countries (Deardorff, 1998). Indeed, the high level of domestic income indicates a high level of availability of goods to be exported and high partner's income may potentially create more demand for exports, and thus, $\beta_1 \; and \; \beta_2 > 0$.

Population variable is proxied as the total population size of each country. The sign of population is ambiguous. In fact, population size represents the market size of each country so that the larger countries trade more. Nevertheless, a larger exporting country in terms of population may need more production to satisfy domestic demand and export less. Similarly, large importing countries may import more because they cannot satisfy all domestic demand with their own production. The domestic population size variable was initially estimated, but omitted from final estimation due to potential multicollinearity problem with domestic income. The domestic income is nearly perfectly correlated with domestic population size variable (Table 2).

The real exchange rate is the bilateral exchange rate of Ethiopia against its trade partners adjusted for their relative price levels, and it is determined as:

$$RER = E\left(\frac{P}{P^*}\right) \quad (\mathbf{4})$$

Where, E is nominal bilateral rate, expressed as the units of foreign currency per unit of home currency, P is the price level of the home country, and P^* is the price level in the foreign country. An increase in value of the real exchange rate indicates an appreciation of the home currency, and it is expected to have a negative impact on export growth due to the resulting loss of international competitiveness. However, Berthou (2008) stated that the elasticity of real exchange rate may depend on the quality of institutions in destination country, the distance between trading partners, and the custom efficiency in both exporting and importing countries.

The distance variable is proxied as weighted distances between trade partners, and can be computed using bilateral distances between the biggest cities of trading partners, those inter-city distances being weighted by the share of the city in the overall country's population (Mayer & Zignago, 2011). The bilateral trade flow is nearly inversely proportional to distance between trading partners, that is, $\beta_4 < 0$. The long geographical distance between trading partners may represent higher transportation costs and more risks of trade. The negative trade impact of distance rose around the mid-20th century and has remained persistently high though some believe that technological change has revolutionized the world economy causing the impact of spatial separation to decline or disappear (Disdier & Head, 2008).

The EBA trade preference is a dummy variable, and 1 is for EU member countries that offered EBA preference to Ethiopia, otherwise zero. The non-reciprocal trade preference is assumed to create export opportunities for beneficiary countries. The preferential trade agreements may help to address some priority needs of low-income countries such as strengthening trade policy, improving investment climate and maintaining a competitive exchange rate (Hoekman, 2011), which ultimately may help to improve exports.

The border and language variables are proxied as dummies. Sharing border and common language may result in more trade between partners, and thus, $\gamma_2 \; and \; \gamma_3 > 0$. Trade agreement between natural trading partners (geographically proximate nations) results in a considerable amount of trade creation due to lower transportation costs, and may also reduce the risk of large amount of trade diversion (Krugman, 1991; Summers, 1991). Sharing common language is also expected to have a strong positive impact on bilateral trade flows as proficiency in the same language may facilitate communication and makes economic transactions easier and transparent (Fidrmuc & Fidrmuc, 2016).

Moreover, the dummy for regional trade agreements (RTAs), that is, COMESA, variable was initially estimated, but omitted from final estimation model due to potential multicollinearity problem with border variable.

3.2 Data Sources and Testing Tools

The effect of EBA on the exports of Ethiopia is examined using a panel of bilateral trade data of Ethiopia with its 34 major trade partners over the period 2001 – 2019. The trade statistics (bilateral exports in U.S dollars) is retrieved from International Trade Center (ITC) database. The importing countries comprise 34 major trade partners of Ethiopia including EU-15 countries. The trade partners were selected based on their trade share in Ethiopia's export and the availability of consistent bilateral trade statistics over the study period. To address the issue of model estimation in log-linearized form, the major trade partners with consistent and non-zero trade data over the study period were included. Some major trade partners of Ethiopia such as Somalia were omitted from the sample because of data unavailability. The importing countries with their respective share in Ethiopia's exports are listed in the Appendix-I. The data for nominal GDP and population size were retrieved from the World Bank's World Development Indicators (WDI) 2020 database, while the bilateral exchange rate data were obtained from the UN Comtrade 2020 database. Data for other variables including the geographical distance (weighted distance), common language and border were obtained from the CEPII database. The dummy for EBA is obtained from WTO database on regional trade agreements.

Using these data, the descriptive statistics and correlation results are presented in Tables 1 and 2, respectively. The correlation results show that bilateral export has a moderate positive coefficient with income and population size variables, while a negative coefficient with distance, EBA and common language.

Table 2: Descriptive summary statistics

Variable	lnX	lnY_i	lnY_j	lnN_i	lnN_j	lnD	$lnRER$
Mean	9.694	24.093	26.913	18.289	17.169	8.468	4.759
Std. Dev.	1.665	0.834	1.722	0.152	1.593	0.659	0.237
Min	2.639	22.784	20.165	18.037	13.505	6.252	4.180
Max	13.285	25.289	30.693	18.535	21.058	9.440	5.565

Source: STATA Outputs

Table 3: Correlation results

	lnX	lnY_i	lnY_j	lnN_i	lnN_j	lnD	$lnREI$	EBA	$LANG$	BOR
lnX	1.000									
lnY_i	0.396	1.000								
lnY_j	0.383	0.186	1.000							
lnN_i	0.391	0.990	0.183	1.000						
lnN_j	0.319	0.042	0.682	0.422	1.000					
lnD	-0.106	0.000	0.744	0.000	0.385	1.000				
$lnRER$	0.204	0.827	0.116	0.811	0.085	0.029	1.000			
EBA	-0.141	0.000	0.133	0.000	-0.268	0.152	-0.047	1.000		
$LANG$	-0.163	-0.000	0.088	0.000	0.116	0.151	-0.006	-0.278	1.000	
BOR	0.013	-0.000	-0.619	0.000	-0.247	-0.684	-0.060	-0.209	0.113	1.000

Source: STATA Outputs

For panel and time series data analysis, determining whether the data series is stationary or not is critical since non-stationary data could provide spurious regression results. However, panel unit root tests suffer from poor size and power distortions when the time-series dimension is too small compared to cross-sectional dimension N. Indeed, the Levin, Lin and Chu (LLC) test has smaller size distortions and would offer improved unit root results for short panels (Hlouskova & Wagner, 2006). Thus, unit root tests are conducted for time-variant variables using the LLC and ADF-Fisher Chi-square tests. The unit root results, presented in Table (3) below, show that all data series have no unit root at level under both tests albeit the domestic income variable seems to have a unit root at level under Fisher test, but stationary at first difference.

Table 4: Unit Root Tests Results

Tests	Unit Root	Variables				
		lnX	**lnY_i**	**lnY_j**	**lnN_j**	**lnRER**
LLC	Level	-8.3822	-8.2055	-9.1165	-7.5623	-2.6987
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0035)
	1st Diff.	-10.1344	-13.0945	-9.8502	-6.3292	-18.9766
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Fisher Type – ADF	Level	49.6126	0.9142	21.1829	24.2855	5.2573
		(0.0000)	(0.1803)	(0.0000)	(0.0000)	(0.0000)
	1st Diff.	18.4443	31.0619	25.7798	9.4246	36.5452
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Decision		I(0)	I(0)	I(0)	I(0)	I(0)

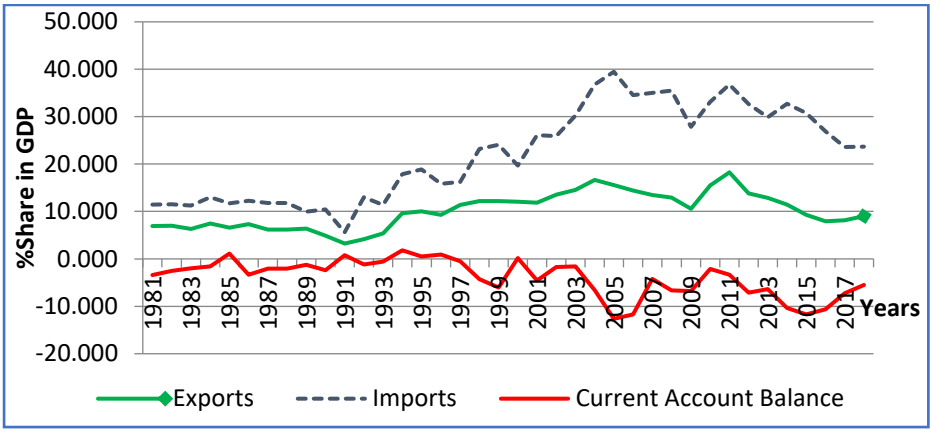
Note: Unit root estimations are with drift term. P-values are in parenthesis.

4. Empirical Results

4.1. Trade Performance of Ethiopia

The total exports of Ethiopia as a percentage of GDP have been incessantly deteriorated for the last decade. Such poor trade performance is partly explained by an overvalued exchange rate, poorly diversified export structure, low sector productivity, and high trade costs associated with poor logistics. The Ethiopian Birr remains overvalued as the exchange rate regime intended to facilitate the country's economic transformation process through infrastructural development, which requires affordable imports of raw materials and machinery (Deren & Motamed, 2020). But an overvalued currency could negatively affect international competitiveness and export growth as it may price export goods artificially high, which would ultimately hinder economic growth and worsen income inequality (Rodrik, 2008). Accordingly, due to a relative reduction in imports of goods and services as a share of GDP, the current account and trade balance have been incessantly in deficit for more than two decades despite some improvement in very recent years.

Figure 2: Total Exports and Imports of Goods and Services as a Share of GDP



Source: World Development Indicators Database, 2020

Regarding trade partners, the majority of Ethiopia's merchandise exports destined to Asia, mainly China and Saudi Arabia, over the last decade with a vast market share in the region accounting for about 43.45 percent of the country's total exports, followed by Europe with 22.92 percent in 2019. Historically, the leading trade partners for Ethiopia are the EU member countries and accounted even more than half of total exports in 1995. However, the share of exports to the Europe market dropped by 10.12 percent since the introduction of EBA scheme in 2001 while the share of exports to the Asian Market increased by about 5 percent over the same period. However, Ethiopia's trade with Africa has not showed any improvement for the last two decades (Table 4). The overall trends of share of exports to major destinations indicate that the EBA scheme seems failed to help Ethiopia to improve her exports to the EU market rather forging to developing markets particularly the emerging Asian economies.

Table 5: Total Exports of Ethiopia by Destination Regions (in % share)

No.	Regions	Years					
		2001	2005	2010	2015	2018	2019
1	Asia	38.51	41.36	43.42	39.82	43.95	43.45
2	Europe	33.04	36.75	33.80	30.30	23.24	22.92
3	Africa	22.27	15.56	15.88	21.17	20.85	21.01
4	America	5.90	6.08	6.00	7.80	11.10	11.80
5	Oceania	0.28	0.25	0.90	0.91	0.86	0.82
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: International Trade Center and UN Comtrade Database, 2020

Thus, the EBA, the most generous trade preference scheme, seems unhelpful in improving Ethiopia's export partly due to domestic supply-side constraints and structural problems. Ethiopia's export sector remains undiversified and remains highly dependent on few traditional commodities such as coffee, oilseeds, live plants and cut flowers, raw hides and skins, live animals, and meat and meat products (see Table 5). All these primary products are highly seasonal and vulnerable to domestic economic, political, social and environmental factors such as inflation, civil conflicts and internal displacements, weather conditions. The Ethiopia's export also depends on partner's economic conditions, commodity demand in the export market including the EU, and production capacity and institutional quality of other primary commodity supplying developing countries to the global market, the EU in particular. Moreover, the trade costs remain high due to poor logistics and infrastructure. According to the World Bank data, Ethiopia is still ranked 126th in the world with an overall logistics performance index (LPI) score of 2.38 in 2016, which even dropped from a LPI of 2.41 in 2010.

Table 6: Structure of exports of Ethiopia by major items (in % share)

No	Product Type	2001	2005	2010	2015	2018	2019
1	Coffee	38.13	38.93	29.81	29.74	25.26	31.80
2	Oil seeds and grains	9.61	20.32	18.40	16.73	21.18	18.50
3	Edible vegetables	6.98	4.06	10.27	18.40	18.26	4.53
4	Live trees, plants and Cut flowers	0.04	1.36	0.79	8.06	0.65	10.28
5	Articles of apparel, clothing accessories	0.20	0.26	0.85	2.41	3.06	11.54
6	Machinery & mechanical appliances	0.44	0.30	3.83	0.09	2.64	4.97
7	Pearls, precious stones, metals	1.18	4.86	13.29	5.79	3.03	3.00
8	Raw hides, skins and leather	18.80	7.45	4.86	3.24	3.26	2.66
9	Footwear, gaiters and parts	0.03	0.10	0.58	1.24	1.71	1.39
10	Meat and edible meat	0.39	2.03	3.58	3.53	6.57	1.14
11	Others	24.20	20.33	13.74	10.77	14.38	10.19
	All products	***100.00***	***100.00***	***100.00***	***100.00***	***100.00***	***100.00***

Source: International Trade Center Database, 2020

4.2 Regression Results

The traditional Ordinary Least Square (OLS) and Fixed Effect (FE) methods are commonly used in the existing empirical literature to estimate the effect of PTAs on export performance using the gravity model specification in log-linear form. However, the choice of the proper panel data model depends on the nature of data and characteristics of the models available for panel estimation. The panel model choice generally depends on the assumption about the likely correlation between the cross-section specific, error component and regressors.

The FE model would be a proper specification to make inferences restricted to the behaviour of cross-sectional units though it may not be feasible for very large units (too many dummies) due to large loss of degrees of freedom and possible multicollinearity among regressors (Baltagi, 2005; Gujarati & Porter, 2009). The random effect (RE) model would produce superior estimates of coefficients (β) if the dataset has few observations per unit and the correlation between the independent variable and unit effects are relatively low (Clark & Linzer, 2015). Despite its omitted variable bias, the RE method can offer what the FE method promises and even more by incorporating time-invariant variables with random coefficients and cross-level interactions. The RE approach is nearly preferable because the FE model, by effectively cut out the key time-invariant variables, provides overly simplistic and impoverished results that can lead to misleading interpretations (Bell & Jones, 2015). The assumption of normally distributed random intercepts, which may basically not, introduces only modest biases. The only reason to opt FE model is when higher-level variables are of no interest, the true data generating process (DGP) has no random slopes, and there are so few level-2 entities (that is, countries) in that random slope are unlikely to be estimable (Bell, Fairbrother, & Jones, 2018).

Although the FE approach cannot be undermined, the RE model should be considered if it is consistent and there is an interest of estimating the effect of time invariant variables such as EBA dummy. In fact, the estimated Hausman and BP Lagrangian Multiplier (LM) test results presented in Table (6) below confirms that the RE model is preferable against the FE and pooled OLS methods, respectively. Hence, the RE model is used to estimate the effect of EBA trade preference on the Ethiopia's exports based on the generalized gravity equation presented in equation (3). The RE with AR (1) remainder disturbance model (Baltagi & Liu, 2012) is also estimated for robustness.

Table 7: Hausman and BP-LM Tests for Random Effect

Test	Purpose	Chi-Sq. Statistic	Prob.
Hausman Test	Fixed vs. Random effect	2.01	0.7339
BP Lagrangian Multiplier test	Random vs. pooled OLS	2096.97	0.0000

Source: STATA Estimation Outputs

The RE regression results are presented in Table (7) below along with the RE with AR (1) remainder disturbance model results. The regression results, as expected, generally revealed that Ethiopia's export would increase for a higher domestic income and trade partner's income, but decrease for an increase in partners' population size and longer distance with trading partners. The estimation results also confirmed that trade partners' population size, the EBA scheme and sharing common language would have a negative effect on export performance for Ethiopia. The coefficients of the bilateral real exchange rate and border variable have the expected negative and positive signs, respectively, but statistically insignificant. The estimation results generally support the empirical findings, among others, of Persson and Wilhelmsson (2013) and (Gradeva and Martínez-Zarzoso (2009).

The positive impact of domestic income on the export value suggested that Ethiopia should improve the domestic productive capacity by altering the behind-border supply-side constraints such as improving trade infrastructure and logistics, strengthening bureaucratic quality and government effectiveness, and creating conducive investment climate for entrepreneurial growth and export diversification particularly in the value-added sectors. Similarly, the country should take advantage of the positive impact of high-income growth in her trade partners' economy through proper macroeconomic policies aligned with exchange rate regime. In addition, the negative effect of distance variable indicated that Ethiopia should better strengthen its beyond-border trade policies and relationships more with geographically proximate partners.

Table 8: Random Effect GLS Estimation Results

	Random Effect GLS			RE with AR (1) Disturbances		
Wald $chi^2(8)$:	253.10			359.77		
Prob_chi^2 :	0.0000			0.0000		
lnX	**Coefficients**	**Std. Error**	**p-value**	**Coefficients**	**Std. Error**	**p-value**
lnY_i	0.4132	0.1628	0.011	0.3618	0.1104	0.001
lnY_j	1.2549	0.2126	0.000	1.2765	0.1450	0.000
lnN_j	-0.2898	0.1278	0.023	-0.3051	0.1337	0.022
lnD	-1.8846	0.3105	0.000	-1.8838	0.3604	0.000
$lnRER$	-0.3386	0.3718	0.362	-0.1604	0.2551	0.529
EBA	-1.0197	0.3559	0.004	-1.0624	0.3452	0.002
$LANG$	-0.8718	0.3334	0.009	-0.8556	0.3490	0.014
BOR	1.3968	1.0825	0.197	1.4449	0.9056	0.111
$\_const$	-10.8946	3.2898	0.001	-10.8472	3.0573	0.000
Rho_ar				0.6365		
sigma_u	0.8868			0.7778		
sigma_e	0.6374			0.5073		
Rho	0.6593					
rho_fov				0.7016		
Theta				0.6462		

Source: STATA Estimation Outputs

Moreover, the EBA preferential access and common language variables have negative and statistically significant coefficients. In fact, LDCs could not be competitive enough in the global market despite comprehensive non-reciprocal preference schemes like EBA due to their weak domestic supply-side policies, poor trade infrastructures, and export concentration on few primary agricultural commodities. For countries with complex behind-border trade problems like Ethiopia, trade may be diverted to other countries for two reasons. First, Ethiopia still should compete with other LDCs to enter into the EU market, where the "Least developed" group is an official classification not a neutral measure of poverty. The EBA policy was actually adopted for essentially political, not development, motives (Page & Hewitt, 2002). Second, Ethiopia has significant trade with other developing and developed countries other than the EU.

Complying with EU product standards and quality practices may not be easy for Ethiopia's exporters.

Thus, the RE estimation results undeniably confirmed the argument that export growth and sustainable development in poor countries are largely determined by the countries themselves. Both financial aid and preferential access to the developed markets play limited role to trigger trade and economic growth particularly in LDCs (Birdsall, Rodrik, & Subramanian, 2005). In particular, the non-reciprocal preferential access programs of the OECD countries to the developing countries have not been very effective due to civil conflicts, supply side weaknesses, and inappropriate macroeconomic policies with overvalued currencies, corruption, governance problems, and institutional weaknesses that inhibit local businesses from taking advantage of market opportunities (Hoekman, 2011). Effective integration of the LDCs into the world trading system requires specific instruments aimed at improving the productive capacity and competitiveness of export producers in preference receiving countries.

5. Conclusions

The study examined the effect of the EBA trade preference on Ethiopia's exports. The empirical results using RE estimations generally revealed that the EBA scheme has a negative and significant effect of the export performance of Ethiopia. The country's export performance may improve for a higher domestic income and an increased partner's income, but deteriorate for a higher trade partners' population size, the EBA scheme, a longer distance and common language sharing with trading partners. The current account balance and total exports as a percentage of GDP of Ethiopia have been incessantly deteriorating for decades. The country's global competitiveness remains at stake due to unsatisfactory export diversification and immense dependence on traditional agricultural commodities. The share of Ethiopia's trade to the EU, the traditional leading trade partner, has been declining despite the extensive non-reciprocal preferential market access opportunities under EBA scheme since 2001. The market for major primary products shifted to the emerging Asia mainly China. The ineffectiveness of the EBA preference may be partially due to the existing poorly diversified export structure, domestic supply-side constraints and poor trade logistics. Thus, Ethiopia should enhance domestic production capacity, improve trade infrastructures and logistics, and diversify export items towards the

industrial or manufacturing sector with a favourable investment climate for export-oriented value-added economic activities. This would help the country to ensure long-run global competitiveness and to effectively reap the trade opportunities of NRTPs from developed economies, the EU in particular.

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Appendix-I: Average Exports of Ethiopia to Major Trade Partners (%share in 2018)

No.	Partner	%share	No.	Partner	%share
1	China	7.12	19	Switzerland	0.05
2	Saudi Arabia	6.77	20	Thailand	0.24
3	USA	10.21		**EU 15**	
4	United Arab Emirates	4.68	21	Netherlands	7.14
5	Djibouti	4.90	22	Germany	6.06
6	Israel	3.82	23	Belgium	2.56
7	Japan	3.72	24	Italy	2.16
8	India	2.43	25	United Kingdom	1.55
9	Korea, Republic of	1.71	26	France	1.02
10	Turkey	1.82	27	Spain	0.57
11	Indonesia	1.34	28	Sweden	0.27
12	Kenya	1.06	29	Portugal	0.29
13	Jordan	0.77	30	Greece	0.28
14	Australia	0.71	31	Finland	0.15
15	Canada	0.68	32	Denmark	0.04
16	Singapore	0.37	33	Ireland	0.02
17	South Africa	0.43	34	Austria	0.03
18	Egypt	0.51			

Source: International Trade Centere Database (2020)

Appendix-II: Regression and Diagnostic Tests Results using STATA

I. The Hausman Test Results

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed       random       Difference          S.E.
-------------+------------------------------------------------------------
        lnYi |   .3593111    .4131865      -.0538755        .0633987
        lnYj |   1.307178    1.254948       .0522295        .0894971
        lnNj |  -.1961946   -.2898071       .0936125        .3427564
       lnRER |  -.2265693   -.3386094       .1120402        .1185673
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          2.01
                Prob>chi2 =        0.7339
```

II. The BP LM Test Results for Random Effects

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        lnX[country1,t] = Xb + u[country1] + e[country1,t]

        Estimated results:
                             |       Var      sd = sqrt(Var)
                -------------+------------------------------
                         lnX |    2.773423        1.66536
                           e |    .4063533       .6374585
                           u |    .7864289       .8868082

        Test:   Var(u) = 0
                                    chibar2(01) =  2096.97
                                Prob > chibar2 =   0.0000
```

III. The Random Effect GLS Estimation Results

```
. xtreg lnX lnYi lnYj lnNj lnD lnRER EBA LANG BOR, re robust

Random-effects GLS regression                   Number of obs      =       646
Group variable: country1                        Number of groups   =        34

R-sq:                                           Obs per group:
     within  = 0.5830                                         min =        19
     between = 0.6428                                         avg =      19.0
     overall = 0.6227                                         max =        19

                                                Wald chi2(8)       =    253.10
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                (Std. Err. adjusted for 34 clusters in country1)
------------------------------------------------------------------------------
             |               Robust
         lnX |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         lnYi |   .4131865   .1628183     2.54   0.011     .0940685    .7323046
         lnYj |   1.254948   .2126318     5.90   0.000     .8381977    1.671699
         lnNj |  -.2898071   .1278484    -2.27   0.023    -.5403854   -.0392289
          lnD |  -1.884608   .3104815    -6.07   0.000     -2.49314   -1.276075
        lnRER |  -.3386094   .3718445    -0.91   0.362    -1.067411    .3901924
          EBA |  -1.019695   .3559353    -2.86   0.004    -1.717315   -.3220741
         LANG |  -.8717805    .333435    -2.61   0.009    -1.525301   -.2182599
          BOR |   1.396844   1.082493     1.29   0.197    -.7248032    3.51849
        _cons |  -10.8946   3.289805    -3.31   0.001     -17.3425   -4.446697
-------------+----------------------------------------------------------------
     sigma_u |  .88680824
     sigma_e |  .63745846
         rho |  .65932313   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

IV. The Random Effect with AR(1) Remainder Disturbance Estimation Results

```
. xtregar lnX lnYi lnYj lnNj lnD lnRER EBA LANG BOR, re rhotype(dw)

RE GLS regression with AR(1) disturbances       Number of obs      =       646
Group variable: country1                        Number of groups   =        34

R-sq:                                           Obs per group:
     within  = 0.5829                                         min =        19
     between = 0.6399                                         avg =      19.0
     overall = 0.6204                                         max =        19

                                                Wald chi2(9)       =    359.77
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         lnX |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         lnYi |   .3618118   .1104421     3.28   0.001     .1453493    .5782744
         lnYj |    1.27647   .1450034     8.80   0.000     .9922682    1.560671
         lnNj |  -.3050869   .1336942    -2.28   0.022    -.5671228   -.0430511
          lnD |   -1.88379   .3603854    -5.23   0.000    -2.590133   -1.177448
        lnRER |  -.1604117   .2551161    -0.63   0.529    -.6604301    .3396067
          EBA |  -1.062407   .3452008    -3.08   0.002    -1.738988   -.385826
         LANG |  -.8556455   .3490259    -2.45   0.014    -1.539724   -.1715672
          BOR |   1.444953   .9055701     1.60   0.111    -.3299322    3.219837
        _cons |  -10.84718    3.05731    -3.55   0.000     -16.8394   -4.854965
-------------+----------------------------------------------------------------
       rho_ar |  .63655147   (estimated autocorrelation coefficient)
     sigma_u |  .77778647
     sigma_e |  .50727039
     rho_fov |  .70157637   (fraction of variance due to u_i)
       theta |  .64618544
------------------------------------------------------------------------------
```