Unlocking Export Potential and the Influence of Country-Specific Characteristics: Evidence from Ethiopia

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Abstract

Export growth is integral to Ethiopia's development agenda. But, notwithstanding various trade policy reforms, exports have not lived up to expectations. This paper examines the gap between Ethiopia's actual and potential exports and the extent to which country-specific social, political and institutional factors have impacted the export gap. A stochastic frontier analysis of gravity model of trade is applied to panel data that covered Ethiopia's 45 trading partners during 2001–2012. Empirical results revealed that Ethiopian exports are very distant from their frontier levels with significant influence of country-specific socio-political-institutional constraints. Thus, the paper stresses the need for Ethiopia to look beyond trade policy if it is to realise its full export potential.

Keywords: Ethiopia, exports, efficiency, socio-political-institutional factors

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Introduction

The role exports play in the process of economic growth is well established in the development economics literature.[1] Thecurrent development strategy of Ethiopia is Agricultural Development-Led Industrialization (ADLI), which puts much emphasis on commercialisation of agriculture and agricultural exports for two main reasons. First, agriculture is the mainstay of the country's economy, accounting for about 42 per cent of gross domestic product (GDP) in 2014 (World Bank 2015a). It is argued by Weeks *et al.* (2004: 73–74) that 'if agriculture is to expand, it must exploit export potential, given the greater extent of the market internationally as a prompt to increasing its specialisation and its associated benefits'.

The second reason is the impact on poverty levels. Ethiopia is Africa's second most populous country (after Nigeria) with an estimated multi-ethnic population of 96.5 million in 2014. About 37 per cent of the population lives below the international poverty line US$1.25 a day (UNDP 2015). Because more than 80 per cent of the population live in rural areas, the large majority of the poor are located in rural areas. And because agricultural products account for about 80 per cent of Ethiopia's merchandise exports, improved export performance will not only increase national income but also will reduce poverty (Diagnostic Trade Integration Study 2004).

Accordingly, Ethiopia has pursued export promotion since the early 1990s by adopting policy reforms, which include devaluation of the exchange rate, removal of duties on virtually all exports, introduction of export credit

guarantee scheme and export trade duty incentive scheme, and establishment of the Ethiopian Export Promotion Agency (EEPA). Nonetheless, Ethiopia's 'export bundle remains relatively small and very concentrated', and the country has not been able to take full advantage of preferential market access opportunities such as Everything But Arms (EBA) of the European Union and African Growth and Opportunity Act (AGOA) of the United States (Diagnostic Trade Integration Study 2004: 35, 70). Export earnings have also failed to match import requirements, causing persistent and widening trade deficits and acute shortages of foreign exchange. This has put a balance-of-payments restraint on the economy.

Ethiopia's Growth and Transformation Plan (GTP) 2010/11–2014/15 aimed to further promote growth and diversification of exports using 'policy and administrative measures' (IMF 2011: 30). Specifically, it was targeted to increase exports of goods and services from 13.6 per cent of GDP in 2009/10 to 22.5 per cent of GDP in 2014/15, averaging 19.4 per cent per annum. However, exports stay well below the authorities' target, accounting for 9.8 per cent of GDP in 2014/15, with an annual average of 13 per cent during the plan period. This weak export growth has increased external vulnerabilities (IMF 2013; 2015).

The key questions to ask, then, include these: How far are Ethiopia's exports from their potential levels? What factors impact creating the deviation? While literature exists attempting to identify factors behind Ethiopia's unfavourable export performance (for example, Ciuriak 2010),

there is a dearth of empirical studies investigating the export potential and the impact of the various factors on achieving it.

The objective of this paper was thus twofold: analyse the extent to which Ethiopia is achieving its export potential; and to show the aggregate impact of country-specific social, political, and institutional factors on creating the export gap. The paper attempted to contribute to the literature in relation to Ethiopia in at least three ways. First, it provided a quantified assessment of Ethiopia's export potential with its trading partners. Second, it gave an insight into whether there is an export gap that is due to country-specific resistances beyond the reach of export promotion reforms. Third, it adopts a theoretical framework that has hitherto been rarely applied to Ethiopia. The theoretical framework is based on Kalirajan (2007), who builds a stochastic frontier gravity model of trade to examine trade gaps between member countries of the Indian Ocean Rim-Association for Regional Cooperation. To apply the model in this study, a macroeconomic panel dataset for the period 2001–2012 was used.

The main findings were as follows. Ethiopia has only realised a median of 15.8 per cent of its frontier level of exports to several markets. Another striking result was that 74 per cent of the gap between the actual and potential exports of Ethiopia is explained by country-specific socio-political-institutional hurdles. This paper argues, therefore, that while export promotion and market access may themselves improve export performance, country-specific constraints significantly diminish their value. It argues that Ethiopia would gain more from its exports if it

eliminates, primarily, internal constraints, some of them enumerated by the previous literature.

The remainder of this paper is as follows. Section 2 provides some facts about Ethiopia's external trade focusing on the export side. Section 3 surveys the relevant literature on export potential and its determinants, including findings for Ethiopia. Section 4 describes the empirical methodology, containing the model, dataset and estimation technique used. Section 5 discusses the results of the empirical analysis. Section 6 concludes.

Some Facts about Ethiopia's External Trade

Ethiopia has become relatively more open to international trade since the trade liberalisation measures it adopted in the early 1990s. During 2000–2014, Ethiopia's external trade-GDP ratio grew from 21 per cent to about 42 per cent. The total merchandise trade rose from about US$1.7 billion to US$23.4 billion in the same period (Table 1). Moreover, Ethiopia has embarked on institutional integration into regional and multilateral trading systems. It is now a member of the Common Market for Eastern and Southern Africa (COMESA) and is in the process for accession to the World Trade Organisation (WTO), having applied for membership in February 2003.

Table 1. Ethiopia's merchandise trade with the World, 2000–2014

|	Values			Growth rates (%)
	2000	2007	2014	2000–2014
Exports (US$m)	482	1277	4437	18.2
Imports (US$m)	1260	5809	18987	23.4
Total external trade (US$m)	1742	7086	23424	21.8
Trade balance (US$m)				
Exports as % of GDP	−778	−4532	−14550	27.1
Imports as % of GDP	5.8	6.5	8.0	3.8
	15.3	29.5	34.1	7.7
Trade balance as % of GDP	−9.4	−23.0	−26.2	10.9
	−161.5	−354.8	−327.9	10.0
Trade balance as % of merchandise exports				

Source: UNCTAD (2016)

So far, Ethiopia's export orientation has been lower than its import dependence. As shown in Table 1, during 2000–2014, merchandise exports grew from US$482 million to US$4.4 billion, averaging an 18.2 per cent annual rate of growth. But, merchandise imports increased from US$1.3 billion to US$19 billion over the same period, at a rate of 23.4 per cent per annum. The GDP share of merchandise exports has been somewhat

sluggish within the 5–8 per cent range, whereas that of merchandise imports went up from 15 per cent to 34 per cent. Meanwhile, Ethiopia ran trade balance deficits throughout the period. The trade deficit reached US$14.5 billion in 2014, rising from US$778 million in 2000. The ratio of trade deficit to GDP increased from 9.4 per cent to 26.2 per cent. It is also observed that trade deficits averaged more than 300 per cent of merchandise exports over the period 2000–2014.

Trade balance, strictly speaking, is determined by the balance between national income and expenditures, where 'sound fiscal policy and sound exchange rate management' are crucial (Rodrik 1992: p. 96). But, it is also partly a reflection of the product composition of foreign trade. Manufactured goods generally command a higher value than primary commodities. Like many of the countries in Sub-Saharan Africa (SSA), Ethiopia's exports are highly concentrated in a few primary products while its imports consist mainly of manufactured goods (Figure 1). Coffee and its substitutes are the most dominant category of products exported from Ethiopia, constituting 23 per cent of the value of total merchandise exports. The next important export items are vegetables (20 per cent), followed by oil seeds and oleaginous fruits (15 per cent), and agricultural raw materials (10 percent). On the other hand, machinery and transport equipment accounted for 34 per cent of the value of total merchandise imports of Ethiopia, followed by fuels (17 per cent), chemical products (13 per cent), and food items (10 per cent). Other manufactured goods combine to comprise 26 per cent of Ethiopia's imports.

Figure 1. Ethiopia's Structure of Foreign Trade, 2012–2014 Average
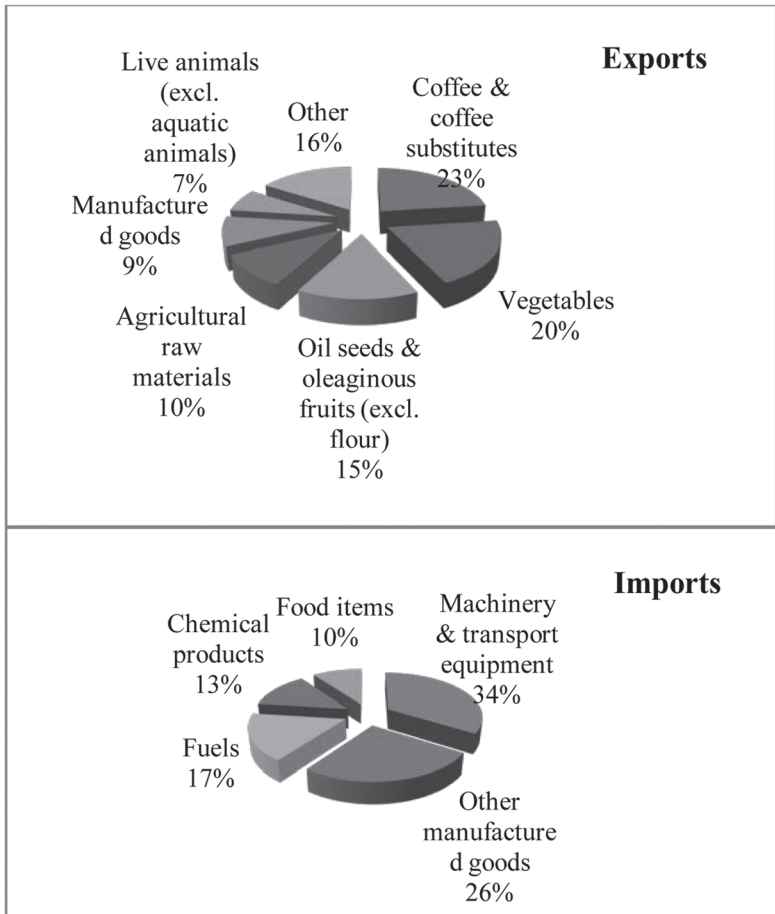
Note: Percentage calculations are based on trade
     values.

Source: UNCTAD (2016).

Ethiopia's merchandise exports have also been largely rigid in terms of market (Figure 2). Until very recently, Europe has been the largest trading partner of Ethiopia. The region accounted for 46 per cent of Ethiopian exports in 2000; but, its relative importance declined in 2014 with a share of 25 per cent. Asia has taken over the leading position from Europe,

accounting for 43 per cent of Ethiopian exports in 2014, up from 29 per cent in 2000. More significant was the emergence of China as the most important destination country for Ethiopian products over the past decade and a half. The Chinese share in overall Ethiopian merchandise exports jumped from almost 0 per cent in 2000 to 12 per cent in 2014 (UNCTAD 2016). African markets, like Europe, are currently receiving about one-fourth of Ethiopia's exports (Figure 2).

Figure 2. Ethiopia's Export Destinations, 2000–2014
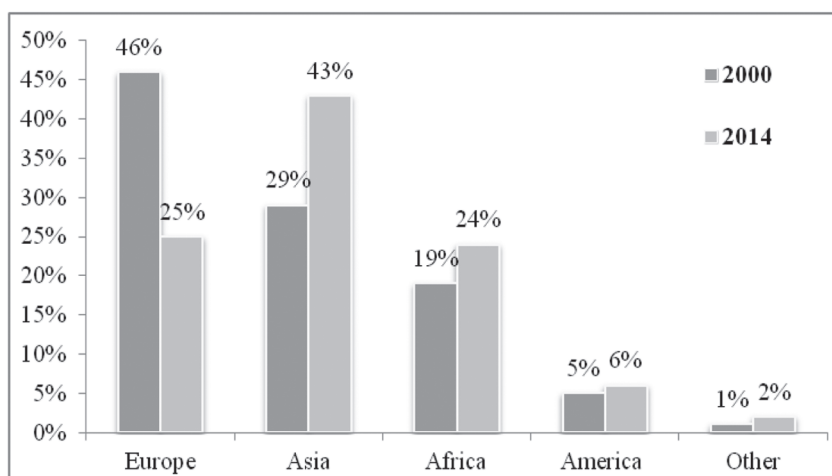
Note: Percentage calculations are based on export values.

Source: UNCTAD (2016).

But, have Ethiopian exports to these markets performed as expected, given the partners' importance in world imports? To answer this question, export intensity index analysis was made.[2] Ethiopian exports to a sample of 45 trading partners were in large part smaller than expected (Table 2). The computed export intensity indices for years 2000 and 2014 are below unity in the majority of cases, indicating that Ethiopia's trade integration with several markets had been lower than expected. Comparatively speaking,

Ethiopia seems well integrated with Djibouti, Sudan, Yemen, Saudi Arabia, Israel, Kenya, Jordan, Egypt, Pakistan, Switzerland, United Arab Emirates, Belgium, and Greece. By contrast, Ethiopia appears to be weakly integrated with Portugal, South Korea, Thailand, Canada, Czech Republic, Singapore, Denmark, Hungary, Tunisia, and many other countries. Furthermore, the export intensity indices exhibited inconsistent trend over 2000–2014, with some values having had risen while others fell. This further suggests the need for Ethiopia to improve its export performance.

Table 2. Ethiopia's export intensity index with its trading partners, 2000–2014

	Index value				Index value	
Trading partner	2000	2014	Trading partner	2000	2014
Algeria	2.40	0.20	Malaysia	0.50	0.05
Australia	0.23	0.46	Morocco	1.61	0.05
Belgium	1.33	1.68	Netherlands	0.68	1.47
Bulgaria	0.51	1.19	Norway	0.20	0.93
Canada	0.17	0.21	Pakistan	4.38	2.55
China	0.11	1.16	Poland	0.70	0.05
Czech Republic	0.26	0.12	Portugal	0.02	0.43
Denmark	0.35	0.04	Romania	1.43	0.18
Djibouti	3301.67	508.23	Saudi Arabia	17.23	9.18
Egypt	5.92	3.96	Singapore	0.29	0.10
Finland	0.35	0.29	South Africa	0.18	0.82
France	0.79	0.36	Spain	0.44	0.15
Germany	2.56	0.92	Sudan	9.06	27.39
Greece	1.08	1.26	Sweden	0.18	0.62
Hungary	0.42	0.07	Switzerland	2.59	2.15
India	1.32	0.43	Thailand	0.10	0.19
Israel	5.51	6.35	Tunisia	0.23	0.12
Italy	1.89	0.78	Turkey	0.04	1.31
Japan	2.00	0.63	United Arab Emirates	1.01	2.46
Jordan	2.82	7.03	United Kingdom	0.55	0.31
Kenya	6.27	3.21	United States	0.25	0.39
Korea, Rep.	0.05	0.45	Yemen	26.53	18.38
Lebanon	0.09	1.76			
Source: Author's calculations based on UNCTAD (2016).					

Literature Review

Much research has been conducted on the importance of estimating countries' export potential and factors explaining it with a view to fostering economic growth. In theory, export potential is defined as the maximum level of exports with the least level of restrictions given the current level of determinants of exports (Miankhel *et al.* 2009). The export potential estimates can give guidance as to: (a) what the prospects are of significantly increasing exports over the near-to-medium term; and (b) which countries present the largest untapped potential for increasing exports (Soderling 2005). Baker *et al.* (2002) argued that it helps a country to establish its export potential first and, based on this, identify gains to be made from removing trade barriers.

Export performance of an economy can be affected by multiple factors. From a theoretical standpoint, Fugazza (2004) categorises them into two types: internal and external. The internal factors are related to supply-side conditions. They depend on, among others, factor costs (which reflect not only reSource endowment but also economic policy and institutional quality), technology, internal transport infrastructure, location, size of the country, and macroeconomic environment. The external factors refer to market access conditions and other factors influencing import demand from abroad. They include factors, such as trade and competition policy, transportation costs (which consist in geography and physical infrastructures), and partners' characteristics, such as their market size and transport facilities.

The empirical evidence on the relative importance of these factors in specific regions is mixed. Fugazza (2004), for instance, using quantile regression techniques for data covering 84 countries over the period 1988–1999, found that supply-side conditions have been more important determinants of export performance in Africa, the Middle East and South Asia, while both supply and market access conditions had been equally important for East Asian and Pacific countries' export performance. Redding and Venables (2002) analysed exports of 101 countries using average data from 1994 to 1997. Based on ordinary least squares (OLS) estimation technique, they found that external geography, internal geography, and institutional quality explain the cross-country variation in export performance. Moreover, their study showed that all three characteristics contribute in approximately equal measure to explaining SSA's 'poor' export performance.

The factors that have been suggested to explain export performance in specific African countries are as many and varied as the researchers' information and interests, as well as their empirical models. For example, using a panel of industry data during the period 1970 – 2002, Edwards and Alves (2006) analyse South Africa's manufacturing exports from dynamic fixed effects and system generalised method of moments (GMM) estimation of export supply and demand functions, and they found that the manufacturing exports are predominantly supply-driven. Their findings showed that real effective exchange rate, infrastructure costs, tariff rates, and skilled labour are important determinants of export supply. Were *et al.* (2002) use time series data from 1972 to 1999 to estimate factors that had

influenced Kenya's export volumes from an error-correction model. They identified these factors to be real exchange rate, investment (to capture supply constraints), and income of trading partners, at varying relative significance between export categories.

There is also a body of literature that examines factors affecting Ethiopia's export performance. Although exports of Ethiopia face bottlenecks both on demand and supply sides (Alemayehu 2001), available empirical studies emphasise the latter. For instance, a qualitative study called Diagnostic Trade Integration Study (2004: 58, 60, 69–70) shows that, in addition to trade facilitation problems related to lack of access to the sea, Ethiopia faces export barriers related to legal and regulatory environment, access to finance, access to trade-related information, intra-government coordination, skills of personnel, bureaucracy, structure of the national institutional framework, and political favouritism.[3] Similarly, Ciuriak (2010), using thought experiments based on gravity model of trade as well as global simulation model, notes that Ethiopia's exports are primarily handicapped by the macroeconomic policy mix, high administrative costs, and private sector underdevelopment.For him, tariffs and border measures are of secondary importance. Based on time series data from 1970/71 to 2002/03 estimated by an error-correction model, findings of Berhanu (2005) indicate that real private sector credit, together with real exchange rate, is a significant determinant of Ethiopian exports.Yishak (2009) employed panel data for 30 trading partners of Ethiopia during 1995–2007 to estimate a conventional gravity model of trade by a generalised two-stage least squares (2SLS) technique. He found that institutional quality

and internal transport infrastructure are major factors affecting Ethiopia's exports.

These studies, however, did not question how far Ethiopia's exports are from their potential levels and to what extent the various factors impact achieving export potential, which are central issues in international trade analysis. Understanding the effect of country-specific characteristics on utilising export potential appears to be particularly relevant in the African context, given the sluggishness of export growth despite trade policy reforms. Notwithstanding the argument that African trade reform can be erratic and marked by reversals and lack of credibility (Rodrik 1997), country-specific constraints, 'which are not seriously addressed by proper reform measures', do create a gap between actual and potential export flows (Kalirajan 2007: 86). In light of this consideration, this paper is meant to add value to the existing debate about measures aimed at influencing export performance in Ethiopia and other comparable countries in the continent.

Methodology

The Model

The model used is the stochastic frontier gravity model of trade, proposed by Kalirajan (2007). Gravity model traditionally explains bilateral trade by economic size and both trade resistance and preference factors (Egger 2002).The model is a convenient tool particularly for estimating export potentials at an aggregated level of analysis where 'proximity in demand, per capita income, space, and culture, are key macroeconomic determinants' (Helmers and Pasteels 2005: 1). It has thus enjoyed

consistent empirical success[4] and received solid theoretical backing (Anderson 1979; Bergstrand 1985).

However, the standard gravity equation used for empirical work has been criticised, among other things, for its weakness in properly capturing 'economic distance' between countries. Geographical distance, as a proxy for transportation costs, is commonly used to represent economic distance. Nevertheless, economic distance includes factors beyond transportation costs, such as government, social, political, and cultural differences, which may be the most important measures of trading distance between countries (McPherson and Trumbull 2008). According to Kalirajan (2007), these factors emanate from socio-political-institutional characteristics specific to home and partner countries. It is argued that omission of these factors from gravity equations results in incorrect estimates (because it affects the log-normal distribution and constant variance assumption of the error term) and OLS estimation in this context would lead to biased results.

To overcome this problem, Kalirajan (2007) suggests application of the method developed for estimating stochastic frontier production functions with composed error terms.The proposed method seeks to estimate a bilateral trade frontier and measures the combined effect of country-specific socio-political-institutional factors as the distance between actual trade and potential trade that is defined by the frontier. This approach is particularly advantageous when researchers do not have information on all factors influencing the economic distance variable. It is also argued to produce potential trade estimates that are closer to free-trade estimates, because frontier estimates represent the upper limits of the dataset.

The stochastic frontier gravity model for exports may be formally written as:

$$X_{ij} = f(Z_m; \beta) \exp(v_{ij} - u_{ij}) \qquad (1)$$

where: X_{ij} denotes actual exports from country i to country j; $f(Z_m; \beta)$ is a function of a vector of determinants of potential bilateral trade (Z_m) and a vector of unknown parameters (β); v_{ij} is a symmetric idiosyncratic error component, which is independently and identically distributed as $N(0, \sigma_v^2)$; and u_{ij} is a non-negative inefficiency error component that is the combined effect of the economic distance factor, which is a function of the socio-political-institutional factors that are within the control of the exporting and importing countries. Here, u_{ij} is assumed to follow a truncated (at zero) normal distribution, $N(\mu, \sigma_u^2)$ independently of v_{ij}.

The values of u_{ij} in equation (1) range between zero and one. When u_{ij} is zero, it means the effect of economic distance is not important and actual and potential exports are the same, assuming v_{ij} is also zero. When u_{ij} is greater than zero (but less than or equal to one), it means the effect of economic distance is important and it constrains actual exports from reaching their potential level (Kalirajan 2007). Following Battese and Coelli (1992), the time-varying structure of u_{ij} can be specified as:

$$u_{ijt} = \{\exp[-\eta(t - T)]\}u_{ij}, \qquad t = 1, 2, ..., T \qquad (2)$$

Where: eta (η) is unknown scalar parameter that determines the temporal behaviour of the economic distance effect, or the total variation in exports from the frontier level of exports that is attributed to country-specific socio-political-institutional factors. This part of the variation in the model is usually defined by:

$$\gamma = \sigma_u^2 / (\sigma_v^2 + \sigma_u^2) \tag{3}$$

where: σ_u^2 and σ_v^2 represent the variances of the error components. Depending on the sign of eta (η) in equation (2), gamma (γ) or the economic distance effect may decrease ($\eta > 0$), remain constant ($\eta = 0$), or increase ($\eta < 0$) as t increases.

Given equations (1) and (2), bilateral observation-specific export efficiency or realisation of potential exports at time t can be computed based on Battese and Coelli (1992) as follows:

$$\exp(-u_{ijt}) = E\left[\exp(-u_{ijt}) \mid \varepsilon_{ijt}\right] \tag{4}$$

where: $\varepsilon_{ijt} = v_{ijt} - u_{ijt}$. The bilateral export efficiency measure varies between zero and one. It will be zero if the exports between the two countries are completely inefficient, while it will be one if the bilateral exports are completely efficient.

Econometric Issues :

The econometric model to be estimated is[5]

$$X_{ijt} = \exp(\beta_0) GDP_{jt}^{\beta_1} POP_{jt}^{\beta_2} PCGDP_{it}^{\beta_3} DIST_{ij}^{\beta_4} \exp(v_{ijt} - u_{ijt})$$

(5)

$$j = 1, 2, \dots, 45$$

$$t = 2001, \dots, 2012$$

where: i denotes Ethiopia; j represents each of the 45 partner countries; t denotes time in years; and β's are unknown parameters to be estimated; X_{ijt} is merchandise exports of Ethiopia to country j in thousands of current US dollars in year t; GDP_{jt} denotes gross domestic product of country j in current US dollars in year t; POP_{jt} refers to the population of country j in year t; $PCGDP_{it}$ is GDP per capita of Ethiopia in current US dollars in year t; $DIST_{ij}$ corresponds to the great-circle distance in kilometres between the capital cities of Ethiopia and country j; v_{ijt} is the random error term; and u_{ijt} is the inefficiency error term that is the combined effect of country-specific characteristics between Ethiopia and its trading partners.

The stochastic frontier gravity model in equation (5) was estimated in a log-linear form using the maximum-likelihood method.[6]Ethiopia's export efficiencies with its trading partners were calculated based on the formula in equation (4). STATA Version 12 statistical software was used to carry out these analyses.

Several null hypotheses on the parameters can be tested using generalised likelihood-ratio test statistics. If the null hypothesis that mu equals zero

(H_0: μ = 0) is rejected, then one concludes that the truncated normal distribution of u_{ijt} fits the data better than the special case of a half-normal distribution. If H_0: η = 0 is rejected, then time-varying efficiency term (u_{ijt}) is appropriate for the sample (Battese and Coelli 1992). If H_0: γ = 0 is rejected, then the effect of country-specific socio-political-institutional factors is evident and the composed error specification is appropriate representation of the data (Kalirajan 2007).

The Data

The econometric estimation for this paper was based on panel data, which are well known for their several advantages over cross-sectional data.[7] The dataset is a balanced panel of Ethiopia's exports to 45 trading partners for the period 2001–2012.[8]The sample of trading partners included Ethiopia's traditional markets such as Djibouti, Italy, Germany, Japan, Saudi Arabia, and the United States, as well as emerging markets such as China. It captures more than 80 per cent of the total value of Ethiopian exports in each year.

Exports data were taken from UNCTAD (2013). Data on GDP, per capita GDP and population were obtained from the World Bank (2014).[9]Data on bilateral distance were Sourced from CEPII (2012). Descriptive statistics of all variables used in the estimated model are summarised in Table 3.

Table 3. Descriptive statistics for Stochastic Frontier Gravity Model, 2001–2012

Variable	Observation	Mean	Std. deviation	Minimum	Maximum
EXP_{ijt}	540	27087.99	47348.28	2.19	318808.40
GDP_{jt}	540	9.55E+11	2.15E+12	5.72E+08	1.57E+13
POP_{jt}	540	9.16E+07	2.50E+08	749604	1.35E+09
$PCGDP_{it}$	540	251.90	120.24	112.83	470.22
$DIST_{ij}$	540	5165.15	2694.38	551.29	12437.38

Notes: Exports are in thousands of US dollars. GDP and per capita GDP are in current US dollars. Distance is in kilometres.

Source: Author's calculations.

Findings

The maximum-likelihood estimates of equation (5) are reported in Table 4. The model appears to fit the data quite well and explain Ethiopia's exports in terms of its production and demand. The Wald chi-squared test statistic was statistically significant at the 1 per cent level with 4 degrees of freedom. The test strongly rejects the hypothesis that all coefficients in the model, except the intercept term, are equal to zero. This indicates that the overall significance of the estimated model is good.

All coefficient estimates are also statistically significant at least at the 10 per cent level and mostly with the expected sign. The higher the GDP of an importer, the more Ethiopia's exports due to greater import demand. The higher the per capita GDP of Ethiopia, the greater the production capacity and hence the export supply. The further the distance between Ethiopia and its trading partner, the less the two-way trade due to higher transportation

cost. The coefficient on the population of the importing country is significantly negative. One possible interpretation is that the larger the trading partner, the less likely it is to engage in international trade because the costs of its intra-national trade are relatively lower (Coe *et al.* 2002).

Table 4. Frontier Gravity Model Estimates for Ethiopia's Exports, 2001–2012

Variable	Maximum-likelihood estimate
Constant	6.722 ***
	(1.368)
Importer GDP (ln *GDPjt*)	1.216 ***
	(0.142)
Importer population (ln *POPjt*)	0.179 *
	(0.097)
Exporter per capita GDP (ln *PCGDPit*)	0.367 **
	(0.170)
Distance (ln *DISTij*)	−3.203 ***
	(0.366)
Sigma-squared	2.260 ***
	(0.724)
Gamma	0.742 **
	(0.084)
Mu	1.536 *
	(0.539)
Eta	0.012
Log likelihood	(0.009)
Wald chi2(4)	
Prob > chi2	

Notes: Number of observations = 540. Estimated standard errors are in parentheses. ln denotes natural logarithm. ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively.

Source: Author's calculations.

Results of particular interest to the present study are found in the middle rows of Table 4. Sigma-squared is the mean total variation in the model during 2001–2012. This coefficient estimate is statistically significant at 1 per cent level, suggesting that Ethiopia's exports had shown significant variation over time. As already noted, gamma measures the mean total variation in exports from the frontier level of exports attributed to country-specific socio-political institutional factors. The gamma estimate is statistically significant at the 5 per cent level and the magnitude is striking. It indicates that about 74 per cent of the total variation in Ethiopian exports had been due to country-specific socio-political-institutional factors, and only the rest had been due to random factors outside the control of the trading countries. The eta coefficient is positive but statistically insignificant, implying that the effect of country-specific factors did not vary significantly over time.

Ethiopia's export efficiencies with its 45 trading partners are reported in Table 5. They are the mean efficiency scores for the period 2001–2012. Given the determinants of exports in the estimated model, Ethiopia had been performing very far from the export frontier. The median value of the mean efficiency scores in the sample was reported to be just 0.158 (or, 15.8 percent).[10] This means that the export foregone due to inefficiency was about 84 per cent. It is depicted that Ethiopia was exporting less than 40 per cent of the maximum attainable levels to all but 10 of its trading partners in the sample.

There is high variation in the mean efficiency scores among trading partners (standard deviation of 0.242). Ethiopia's exports had performed

much higher than the sample average with countries such as Djibouti (0.829), China (0.778), Switzerland (0.765), and Belgium (0.704). On the other hand, Ethiopia had recorded a lower-than-average export performance with several trading partners, such as Kenya (0.015), Czech Republic (0.019), Lebanon (0.019), Poland (0.021), and Hungary (0.026). It is also interesting to note that exports to the recently emerged market of China outperformed those to traditional markets such as Saudi Arabia, Germany, Italy, and the United States (see results in Table 5).

Table 5. Ethiopia's Mean Efficiencies with its Export Destinations, 2001–2012

Export destination	Mean efficiency	Export destination	Mean efficiency
Algeria	0.060	Morocco	0.247
Australia	0.520	Netherlands	0.579
Belgium	0.704	Norway	0.064
Bulgaria	0.105	Pakistan	0.549
Canada	0.361	Poland	0.021
China	0.778	Portugal	0.158
Czech Republic	0.019	Romania	0.097
Denmark	0.036	Saudi Arabia	0.087
Djibouti	0.829	Singapore	0.610
Egypt	0.100	South Africa	0.079
Finland	0.079	South Korea	0.164
France	0.086	Spain	0.038
Germany	0.310	Sudan	0.062
Greece	0.072	Sweden	0.168
Hungary	0.026	Switzerland	0.765
India	0.150	Thailand	0.347
Israel	0.173	Tunisia	0.243
Italy	0.159	Turkey	0.086
Japan	0.592	United Arab Emirates	0.129
Jordan	0.663	United Kingdom	0.165
Kenya	0.015	United States	0.340
Lebanon	0.019	Yemen	0.065
Malaysia	0.366		

Notes: Overall mean efficiency = 0.250; Median = 0.158; Standard deviation = 0.242; Skewness = 1.08.

Source: Author's calculations.

Overall, the findings in Tables 4 and 5 provide useful insights for policy. They suggest that there is ample space for increasing Ethiopia's exports with the given level of trade determinants and technology by removing country-specific social, political and institutional constraints. The present findings thereby lend strong support to earlier work which attempts to identify the Ethiopia-specific constraints (for example, Diagnostic Trade Integration Study 2004; Ciuriak 2010) and constraints specific to other SSA countries (Fugazza 2004). It is evident that these constraints seriously undermine Ethiopia's aspiration to accelerate economic development by exploiting its export potential that is estimated to be considerable in the present study.

From the findings, it can also be inferred that trade policy reforms alone are not adequate to unlock Ethiopia's full export potential. In addition to the trade reforms implemented at home, the country already enjoys favourable market access conditions by virtue of being a least developed country. Will WTO accession have a more positive direct impact on Ethiopia's export performance through improved market access? As Bienen (2009) argues, the answer is negative—not least because both tariff and non-tariff measures are likely to remain largely unchanged for Ethiopia. He also observes that Ethiopia's exports are primarily weakened by limited supply capacities rather than market access limitations. According to Bienen's (2009, p. 12) evaluation, the main benefit of Ethiopia's WTO accession will be in terms of providing an incentive for the Ethiopian private sector to become more competitive.[11]

In addressing country-specific hurdles, SSA countries like Ethiopia can learn important lessons from the success of East Asian exporters. For example, the East Asian economies had by and large efficient labour market, quite high educational attainments, and reasonably efficient governmental services, including transport and communications (Krueger 1990). There was also a process of building a strong network of government and business institutions alongside vigorous export orientations. In East Asia, this has involved the creation of 'a strong meritocratic civil service' and 'a series of formal and informal links with the entrepreneurial classes to assist in the design, implementation and coordination of policy measures' (Akyüz *et al.* 1998: 15–16). Organisation of the civil service has crucial features such as substantial degree of insulation from political pressures, personnel continuity and high learning capability of core bureaucrats (Akyüz *et al.* 1998).

There are also valuable lessons Ethiopia can learn from the success of other African countries such as Mauritius and Botswana. Mauritius, for instance, has achieved export-led industrialisation, starting with a monocrop (sugar) economy, no minerals or oil deposits, and weak initial conditions. But a number of internal factors have contributed to the success of Mauritius. These include cross-ethnic government, basic ideological consensus on development strategy, capable public service, relatively autonomous state bureaucracy, a cadre of educated officials and planners, professional system of administration, and participation of academics (Meisenhelder 1997; Kiiza 2006). Moreover, successful export of locally manufactured goods critically depended on relatively cheap, skilled, and

stable labour force created by government policies in education and social services (Meisenhelder 1997). Needless to say, the above country-specific features are not distinct, but rather complementary.

By comparison, Ethiopia faces enormous social, political, and institutional challenges, as suggested by a multitude of indicators. Ethiopia was ranked in the bottom 15 of the UN's Human Development Index for 188 countries in 2014 (UNDP 2015). It received an economic freedom score of 51.5 out of 100 in 2015, being classified as 'mostly unfree' in the process (Miller and Kim 2015). Note that low levels of economic freedom signify high levels of government, social, or political barriers to trade (McPherson and Trumbull 2008). In the 2015 'Ease of Doing Business' ranking, Ethiopia was ranked 148th out of 189 with a score of 49.24 (out of 100) (World Bank 2016). The country does not fare well in specific measures of the quality of governance, scoring low (on a −2.5 to +2.5 scale) with regard to control of corruption (−0.43), government effectiveness (−0.47), rule of law (−0.42), regulatory quality (−0.98), political stability and absence of violence (−1.24), and voice an d accountability (−1.26) in 2014 (World Bank 2015b). Furthermore, Economist Intelligence Unit (2015) rated Ethiopia as 'authoritarian regime' with the 2014 democracy index score of 3.72 out of 10, which compares unfavourably with the SSA average (4.34).

Observational diagnosis of the Ethiopian condition would not suggest a different result. For example, the political environment is full of rancour, deep resentment, and acrimony, to say the least, and there is a world of differences between the ideologies of the ruling party, Ethiopian People's

Revolutionary Democratic Front (EPRDF), and the opposition. EPRDF, in fact, now controls all the 547 parliamentary seats in the aftermath of the 2015 general elections. By the ruling party's own admission, corruption is widespread throughout the public service and a good-governance government remains elusive. Moreover, the party's apparent preference for political loyalty over competence when appointing officials has been debatable at best. Most observers also call into question the country's human rights record and the independence of the judiciary. The government and scholars, in general, can be seen to regard each other with suspicion, keeping the latter in the periphery of policy-making. All these and other domestic weaknesses have undesirable consequences for economic development in general and for export performance in particular.

Conclusion

Ethiopia started liberalising its external trade in the early 1990s. It has since adopted various export promotion reforms to enhance the role that exports play in economic growth and poverty reduction. However, exports have underperformed significantly. Despite encouraging growth rates in recent years, they remain relatively low in terms of value and highly concentrated in commodities. The calculations of export intensity indices demonstrate that Ethiopia's exports to several markets are also lower than expected, given the partners' importance in world trade. Besides, export earnings have lagged significantly behind import payments for a long time with adverse effects on the economy.

This paper analysed export efficiency and the impact of country-specific attributes in Ethiopia. Based on a stochastic frontier analysis of gravity model, which is applied to panel data that covered Ethiopia's 45 trading partners over the period 2001–2012, the median export efficiency is found that it had been just 15.8 per cent. Additionally, it is revealed that a large proportion of the variation in potential exports— about 74 per cent — was accounted for by country-specific socio-political-institutional factors between Ethiopia and its trading partners. The broad conclusion emerging from these results is that Ethiopia can increase its exports in aggregate terms with the same level of trade determinants and technology by improving the social, political, and institutional environment within the country.

The major implication of this finding for policy is that measures to address the socio-political-institutional resistances existing primarily at home should be afforded the highest priority if Ethiopia is to better seize market access opportunities and improve its export performance. It is clear that, while necessary, Ethiopia's trade policy reforms (credibility and regularity issues notwithstanding) are not sufficient to unlock the country's export potentials. Preferential trading privilege, like AGOA, is not a panacea either. Toward realising this, it is important now that Ethiopia is in accession talks with the WTO.

It may be argued that Ethiopia cannot fix internal constraints over night. But country experiences show that it is feasible to address country-specific impediments through time with appropriate mix of policy instruments.

For example, legal, regulatory, bureaucratic, and political bottlenecks can be dealt with in a relatively short period of time if, more than anything else, the political will exists. On the other hand, constraints such as those related to infrastructure and human capital do, indeed, require more time to fix. The ongoing and planned public investments in roads, railroads, and hydropower projects (including the Renaissance Dam with generation capacity of 6000 megawatts), are steps in the right direction. So is the continued expansion of education and health care throughout the country but more no doubt remains to be done in terms of quality.

Finally, it must be emphasised that the problem of tapping deep into export potential is not limited to the external trade sector. Rather, it requires a multi-sectoral approach. It has also been argued that supporting export sectors based on analysis of supply-side resistances at the sector level is lacking in Ethiopia (Binen 2009). The empirical evidence in this paper makes a strong case for the need to act on such gap in policy. The paper suggests that it might be helpful for the Ethiopian government to forge links with the private sector and academics in the area of policy design and implementation.

Notes

1. For an overview of the literature on correlation between exports and economic growth, see Michaely (1977); Ram (1987); Santos-Paulino (2002); De Matteis (2004).

2. Export intensity index can be formally defined as:

$$I_{ij} = \frac{X_{ij}}{X_i} \bigg/ \frac{M_j}{M_w - M_i}$$

where X_{ij} is country i's exports to country j; X_i corresponds to i's total exports; M_j denotes j's total imports; M_w represents total world imports; and M_i refers to i's total imports. The value of the index ranges from zero to positive infinity. A value greater than unity indicates that i's exports to j are larger than expected, given j's importance in world imports (Yamazawa 1970).

3. Diagnostic Trade Integration Study falls under the programme known as the Integrated Framework for Trade-Related Technical Assistance to least developed countries.

4. For examples on the application of gravity model, see Frankel *et al.* (1995); McCallum (1995); Rose (2000); Péridy (2004).

5. The efficiency literature discusses different functional forms, such as Cobb-Douglas, translog and quadratic. This paper, however, uses the Cobb-Douglas form, which is estimated very frequently in practice for it is computationally easier (Pitt and Lee 1981) and does not require very high number of observations (Baten *et al.* 2009). In the gravity model literature too, the Cobb-Douglas log-linear form is argued to be

'a fair and ready approximation to the optimal form' (Sanso *et al.* 1993: 274).

6. It is argued that 'the widespread appeal of MLE [maximum-likelihood estimation] is that it is generally the most asymptotically-efficient estimator when the population model ... is correctly specified' (Wooldridge 2000: 714–715).

7. For advantages of panel data in gravity model analysis and stochastic frontier analysis, see Egger (2000) and Kumbhakar and Lovell (2000), respectively.

8. The sample period starts from 2001 for three reasons. First, given one of the objectives of this paper, it enables assessment of Ethiopian exports after major trade policy reforms have been implemented. Second, it avoids the major disruptions to the economy due to the Ethiopia-Eritrea war which occurred during 1998–2000. Third, statistics-wise, it ensures panel data with no missing observation.

9. A gap in GDP data at the World Bank for Djibouti in the year 2012 was filled from the UNSD (2014).

10. The median appears to give a more accurate reflection of central tendency among the mean export efficiency scores than does the overall mean, given the asymmetry in the distribution of the scores (skewness of 1.08).

11. In fact, there has even been suggestion that SSA countries are better off out of the existing WTO framework—at least owing to its 'unfair' rules that govern international trade. See Madichie (2007) for a detailed outline of the arguments for and against SSA's membership of the WTO.

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