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Abstract:

Several studies highlight that exporters in developing countries face substantial trade costs. To reduce these costs, a few developed countries mainly Canada, the EU, Japan and the USA granted preferential market access to these exporters. We assess whether these preferential accesses have contributed to the economic development of the beneficiary countries. Focusing on the ACP countries over the period 1970-2009, we show that only the EU preferential scheme is effective in promoting exports and that market access plays a significant and economically large role in the development of beneficiary countries. This effect is more pronounced for high-aid receiving countries.

Keywords: Preferential market access, foreign aid, economic development, gravity model, ACP countries

JEL Codes: F15, O10, R10

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1 Introduction

The issue of preferential market access for the least developed countries (LDCs) is still of contemporary relevance even though the World Trade Organization (WTO) to some extent has improved the market access for LDCs. Highlighted in recent studies is the fact that LDCs' exporters still face substantial and higher trade costs in accessing the developed countries' (DCs) markets compared to DCs' exporters (Hoekman and Nicita, 2011; De Sousa et al., 2012). Specifically, Hoekman and Nicita (2011) indicate that non-tariff trade barriers such as quantitative restrictions, complex rules of origin, technical product regulations, anti-dumping and countervailing measures are more restrictive for LDCs' exporters in DCs. To this end, preferential trade access remains a viable and relevant trade policy tool to improve market access for LDCs.

Theoretically, new economic geography (NEG) theory states that the degree of market access can explain cross-country differences in the level of economic development, in that greater market access is associated with a higher income level. Myriad channels have been identified through which market access can affect economic development. Collier and Venables (2007) emphasize two main channels; transfer of rent (import tariff) and export supply response through creating employment. Acemoglu et al. (2005) emphasize that greater market access may facilitate economic development through the adoption of DCs' institutions. At the firm level, other channels through which foreign market access can affect economic development include enhanced productivity of firms (learning by exporting) and higher wages for employees working in firms that are engaged in exporting activities. Many studies offer overwhelming evidence that exporting firms in LDCs attract foreign direct investment, experience higher productivity premium, pay higher wages and are more capital-intensive with higher technology (see for example Mengistae and Pattillo, 2004; Blalock and Gertler, 2004; van Biesebroeck 2005). Empirical findings by Redding and Venables

(2004), Romalis (2007), Bosker and Garretsen (2012) and Head and Mayer (2011) confirm this role of market access to economic development.

In retrospect, the United Nation Conference for Trade and Development (UNCTAD) spearheaded the granting of preferential access, primarily tariff-free and quota-free access, to exports from the LDCs. These preferential arrangements were made under the popular Generalized System of Preferences with the main objective of raising export earnings, promoting industrialization and accelerating the economic growth rate of preference receiving countries. Traditionally, the preferential trade agreements (PTA) were granted by a group of countries called the Quad countries (the US, the EU, Canada and Japan)—which account for more than 90% of total world trade. These countries are also the main destinations of exports from LDCs, and therefore having preferential access to these markets is considered very relevant.

Several studies on the extent to which preference-receiving countries utilize these PTAs and their effectiveness in promoting exports have produced mixed results. In assessing the effectiveness of the preferential access, most studies rely on the utilization of preferences in terms of product coverage and preferential margins. Bureau et al. (2007) and Frazer and Van Biesebroeck (2010), by focusing on product coverage and preferential margins, find high utilization rates of the EU and US preferential schemes. A small batch of papers using the gravity model on both aggregated and disaggregated trade data conclude have been inconclusive. Without focusing on any donor-specific PTAs, Rose (2004) and Aiello et al. (2010) conclude that PTAs have a strong positive effect by doubling trade. Similarly, considering the EU PTA granted to the African Caribbean and Pacific (ACP) countries, Nilsson (2002) and Manchin (2006) find a significant and positive effect on exports. On the contrary, Lederman and Özden (2004) find the US PTA to have negative effect on imports and Gamberoni (2007) finds anti-diversification effect of EU PTA on ACP exports. Pomfret (2007) points out that the unilateral and revocable nature of these PTAs made them feeble

instruments in promoting exports. Herz and Wagner (2011) also indicate that their complex designs tend to make them ineffective in the long-run.

The principal contributions of our paper are twofold. First, we extend the effectiveness measure of the PTAs from trade to economic development.[1] This is important because one of the core objectives of the PTAs according to UNCTAD was to accelerate economic development of the preference-receiving countries. In doing so, we compare the effectiveness of PTAs granted by traditional preference donors using a more rigorous econometric approach. This is relevant because, to the best of our knowledge, only a paper by UNCTAD (2003) compares the effectiveness of the Quad PTAs but solely on basis of utilization of preferences. Even the studies that used an econometric approach either focus on one specific PTA or do not differentiate between the Quad countries. In addition, we employ an approach that deals with basic econometric concerns of estimating the gravity model—zero trade flows, and the multilateral resistance term (MRT). We follow Santos-Silva and Tenreyro (2006) and use Poisson Pseudo Maximum Likelihood Estimator (PPML) to deal with the high frequency of zero flows in the data. We also deal with the MRT using the newly developed approach by Baier and Bergstrand (2010).

The second contribution of the paper comes from examining the role of foreign aid as an important element that determines the effectiveness of preferential market access. To this end, we analyze whether there exists any differential effect of market access on economic development in low-aid and high-aid receiving countries. This is motivated by the fact that, in the establishing the preferential market access, the EU, for example, established the European Development Fund (EDF). This is the main instrument through which the EU provides development and technical assistance to support ACP preference-receiving countries. Additionally, various members of the EU also provide aid for trading activities to ACP states. In this sense, foreign aid would complement

[1] Romalis (2007) looks at this but rather focused only on trade preferences granted by US and also used trade openness as a measure of market access. We construct our market access index based on NEG theory.

market access by reducing the supply-side constraints in order to help preference-receiving countries utilize their market access opportunity more effectively. Focusing on supply-side constraints, Silva and Nelson (2012) argue that foreign aid targeting trade-related projects and trade-supportive infrastructures would improve allocative efficiency and production capacity to enhance trade and growth. Conversely, another strand of literature argues that foreign aid may cause the Dutch disease and price distortions that are inimical to the export competitiveness of aid-receiving countries (see e.g. Bjørnskov, 2010; Rajan and Subramanian, 2011).

In this paper, we adopt a four-step procedure to compare and assess how the PTAs affect market access and then economic development. In the first step, we compare the bilateral trade effects of PTAs granted by the Quad countries using a gravity model and discuss the conditions specific to a PTA that would make it more effective than the others. In the second step, we construct a market access index within the NEG framework. In the next step, we assess the extent to which market access explains cross-country differences in the level of economic development within the basic framework of an augmented Solow model. As a final step, we examine whether PTAs that focus on both improving market access on the demand-side and reducing production capacity constraints on the supply-side could produce a better outcome by looking specifically the role of foreign aid.

Our results indicate that preferential access granted by the EU is more important vis-à-vis other schemes in explaining the trade performances of the ACP countries. The effectiveness of the EU scheme compared to other schemes emanates from its extensive product coverage and the contractual nature of the agreement, which guarantees the stability and security of the scheme. After constructing market access to each EU member country while explicitly accounting for PTAs, we find that these preferential market accesses have a positive and significant effect on the economic development of ACP countries. In addition, by considering aid flow from the EU, we find

differential effects of market access between high- and low-aid receiving countries. In that, there is greater positive impact of market access in high-aid receiving ACP states. This result holds when all donor countries are considered.

The rest of the paper proceeds as follows. Section 2 describes the data and main variables. Section 3 provides an empirical framework based on the gravity model, NEG theory and an augmented Solow model. Section 4 estimates the model and discusses the results. Section 5 concludes.

2 Data Description

We focus on the entire group of ACP countries and their export trade with the Quad preference-giving countries.[2] Using the ACP countries is appropriate as they enjoyed preferential market access from all the Quad countries, which are the main export destinations of ACP countries. We focus our analysis on the time period 1970-2009. Restricting the scope to this period is appropriate in the light of newly introduced reciprocal economic partnership agreements between the EU and the ACP countries in 2009.

The dataset used in this paper is constructed by combining information from five sources. First, we use export flows from the IMF direction of trade database. We consider aggregate exports of 61 ACP countries to preference-giving countries—27 EU member countries, the US, Canada and Japan. Looking aggregate exports provides the advantage of data availability over longer time horizon.[3] Second, data on gravity model variables such as bilateral distance, GDP, population, area, variables on colonial ties and trade agreements comes from the CEPII database. We rely on the OECD database for the aid variables, which provides information on actual disbursement rather

[2] Appendix 1 provides the complete list of countries considered in the study.

[3] Other databases such as BACI and UN COMTRADE provide export data at a highly disaggregated level. But the available data mostly starts from early 1990s. Further, we exclude 18 ACP countries due to data unavailability.

than commitments. We also use the World Bank Development Indicators database for information on gross primary school enrollment; gross domestic saving as percentage of GDP; population growth after correcting for capital depreciation and technological progress; percentage of urban population; value added of agriculture to GDP and value added of oil to GDP.[4] Lastly, we use the Polity IV, a measure of institution and policy quality, developed by Marshal et al. (2013).

3 Empirical Framework

Consistent with the objectives of the paper, we use a three-step estimation technique in assessing the trade and economic development effects of preferential market accesses. In the first step, we use the gravity model to comparatively assess the effectiveness of the several PTAs granted by Quad countries to ACP countries. Following Anderson and van Wincoop (2003), we base our estimation of the benchmark gravity model as in equation (1).

$$ln(X_{ijt}) = \alpha_{ij} + \alpha_t + \beta lnM_{it} + \gamma lnM_{jt} + \mu D_{ij} + \delta PTA_{ijt} + \varepsilon_{ijt} \qquad (1)$$

X_{ijt} is export flow from country i and j, α_{ij} are the dyadic (country-pair) fixed effects, and α_t are the time dummies. M_{it} and M_{jt} are vectors of monadic variables of the exporter and importer, respectively. The monadic variables consist of Gross Domestic Product (GDP), multilateral resistance term, population and geographical area. D_{ij} is the vector of the dyadic variables consisting of distance between country i and j, and dummy variables capturing colonial ties and common language. PTA_{ijt} includes dummy variables for each of the Quad's PTA and ε_{ijt} is the error term. In practice, we lag the PTA variable to account for the phased-in agreements and lagged terms of trade effect by virtue of institutional design of trade agreements (Baier et al, 2008). Given

[4] We follow Mankiw et al (1992) and use constant factor (0.05) as a proxy for both technological growth and rate of capital depreciation. The results also hold when we do not use his correction factor.

that the comparison of the preferential market access is at the Quad countries level, no differentiation is made between the various regimes within a specific PTA.

Estimating equation (1) brings to the fore two main econometric concerns—the multilateral resistance term and the zero flows. The multilateral resistance term highlights the fact that trade flow between any two countries is not solely determined by the bilateral variables between these two countries, but also by their relative position to the rest of the world. Anderson and van Wincoop (2003) indicate that the MRT is theoretically consistent with the microeconomic derivation of the gravity model. Several studies have shown that ignoring this term produces inconsistent estimates of standard gravity model coefficients (Anderson and van Wincoop, 2003; Helpman et al., 2008). In order to best handle the omission, Feenstra (2004) recommends including time-varying fixed effects in the gravity regression. However, the inclusion of the exporter-year and importer-year fixed effects leads to high dimensional fixed effects, thereby resulting in an incidental parameter problem especially for the non-linear estimation methods. To overcome these shortcomings, we follow the Baier and Bergstrand (2010) proxy variable approach.[5]

The second econometric concern comes from the fact that there are substantial zero flows in the bilateral trade data, 35% in our case. Unless these zero flows are randomly distributed, they introduce self-selection bias into the model resulting in inconsistent estimates. Several studies such as Lederman and Özden (2004) and Gamberoni (2007) deal with the zero flows using the Tobit estimator.[6] Alternatively, Santos-Silva and Tenreyro (2006, 2011), Martinez-Zarzoso (2013), and

[5] In this approach the multilateral resistance term is derived from the first-order log-linear Taylor expansion of the multilateral price equations within the theoretical gravity equation which yields an empirical reduced-form equation: $MRT_{ijt} = \frac{1}{N}\left[\sum_i^N \ln T_{ijt} + \sum_j^N \ln T_{ijt} - \frac{1}{N}\left(\sum_i^N \sum_j^N \ln T_{ijt}\right)\right]$. This measure is simple averages of multilateral relative to world trade costs (T_{ijt}), where T_{ijt} is replaced with observable trade costs such as distance. This approach has been used in recent studies: Egger and Nelson (2011), Hoekman and Nicita (2011) and Silva and Nelson (2012).

[6] Left-censoring at zero as employed in the Tobit estimator for trade data is not a plausible assumption. Santos-Silva and Tenreyro (2006) indicate that the Tobit estimator produces inconsistent estimates.

Head and Mayer (2013) recommend the use of the PPML estimator.[7] Similar to equation (1), we specify the PPML model as:

$$E\left(X_{ijt}\middle|Z_{ijt}\right) = exp(\alpha_{ij} + \alpha_t + \beta lnM_{it}t + \gamma lnM_{jt} + \mu D_{ijt} + \delta PTA_{ijt} + \varepsilon_{ijt}) \quad (2)$$

Exports (X_{ijt}) are now measured at level and Z_{ijt} is a vector of explanatory variables similar to equation (1). In the second step, we follow Redding and Venables (2004), Head and Mayer (2011) and Bosker and Garretsen (2012), and construct a market access index for each of the ACP countries to individual EU member countries. The construction of the markets access index follows from the gravity model that relates bilateral exports between country i and j to supply potentials (s_i) of country i, market demand potentials (m_j) of country j and trade cost (T_{ij}) between them. This relationship is given by:

$$X_{ij} = s_i \underbrace{[m_j T_{ij}^{1-\sigma}]}_{MA_{ij}} \quad (3)$$

The market access (MA) index is captured by market demand potentials (m_j) of country j, trade cost (T_{ij}) and elasticity of substitution between product varieties (σ). The market demand potentials of a country encompass mainly monadic variables for the importer in the gravity model such as GDP and population that make the importer a potential buyer of goods from the exporter. The trade cost is captured by a vector of dyadic variables including distance, common language, colonial ties and preferential trade agreement. Bilateral distance has a negative relationship with market access, in that, a longer bilateral distance would result in a higher trade cost emanating from higher costs of

[7] This estimator has been extensively used in recent studies such as Persson and Wilhelmsson (2013), Afesorgbor and van Bergeijk (2014). It solves the zero flows and also consistent in the presence of heteroscedasticity.

transport, thus, leading to a lower market access. A common language and colonial ties are supposed to have a trade cost-reducing impact as common language and culture would reduce the administrative costs associated with trade transactions. Preferential trade agreement takes a focal point in these dyadic determinants of trade cost as they can be used effectively to eliminate non-tariff and tariff barriers. The market potentials are captured using the estimated importer fixed effects (α_j) that signify the importers' capacities. Thus, we construct the market access index separately for each ACP country to each PTA donor and sum overall the donor countries for each year. More specifically, the MA index is estimated mathematically as in equation (4).

$$MA_{ij} = \sum_{j}^{n} \exp(\alpha_j) T_{ij}^{\beta} \qquad (4)$$

In the third step, the constructed MA index is used as the main variable of interest in cross-country regressions to explain the differences in the level of economic development. Head and Mayer (2011) have shown empirically that the NEG framework is relevant and applicable to LDCs. In this framework, the wage rate any given firm is willing and able to pay is a function of distance weighted market access to foreign markets (Redding and Venables, 2004). In line, with the Head and Mayer (2011) assertion of a broader applicability of wage equation, we specify the wage equation within the general framework of the Solow model augmented with human capital and other country-specific characteristics as in Bouhol and de Serres (2010) in equation (5). The market access variable is then assumed as part of the Solow residual. Given that we use total exports rather than manufacturing exports, we measure economic development in terms of GDP per capita as in Head and Mayer (2011). The use of total exports enables the measurement of the overall impact of

preferential market accesses, which basically covers both the primary and manufactured goods that ACP countries export.

$$ln(GDPperCapita_{it}) = \alpha_0 + \alpha_i + \alpha_t + \beta\, ln\left(MA_{ijt}\right) + \gamma ln(C_{it}) + \epsilon_{it} \quad (5)$$

C_i is a vector of control variables as in Mankiw et al. (1992) and in Bosker and Garretsen (2012). We rely on the use of country fixed effects as solutions to the endogeneity problem of omitted variable bias that characterized regression analyses of growth models. These country fixed effects would proxy for time-invariant country-specific variables such as cultural, historical, political and social factors that are likely to correlate with market access or induce investment in human and physical capitals thereby leading to breakdown of orthogonality assumption in regression analyses. Head and Mayer (2011) also pinpoint to endogeneity arising from circular dependence in the domestic market access index construction as the construction involves the use of income levels. However, this would not be problematic as our central focus is on foreign market access.

In the final step, we introduce an interaction term between the constructed market access index and the aid variable as shown in equation (6). For convenience of interpretation, the aid variable was converted into an indicator variable by using the threshold that if aid as percentage of GDP received by a country in a particular year is greater than the 50^{th} or 75^{th} percentile for all countries in each year, then that country is labelled as a high-aid receiving country (the indicator variable takes the value of 1). Otherwise, the country is a low-aid receiving country with the indicator taking the value zero.

$$ln(GDPperCapita_{it}) = \alpha_0 + \alpha_i + \alpha_t + \beta\, ln\left(MA_{ijt}\right) + \eta\, Aid_{ijt} + \delta\, ln\left(MA_{ijt}\right) * Aid_{ijt} + \gamma l\, n(C_i) + \epsilon_{it} \quad (6)$$

4 Results and Discussion

4.1 *Comparative assessment of the Quad PTAs*

First and foremost the PTAs can effectively affect the economic development if they significantly improve the market access through increased bilateral exports to the four main PTA donors. Using equation (2), we estimate and compare the effectiveness of the preferential market access granted by Canada, the EU, Japan and the US to the ACP states. All trading partners without a PTA between them at a point in time are the benchmark category.

[Insert Table 1 here]

In Table 1, column 1 shows the PPML estimates without using dyadic fixed effect and multilateral resistance term. Although the coefficients are significant and have the expected signs, this does not deal with the problem of endogeneity. The results in column 2 control for the time-invariant heterogeneity by including the dyadic fixed effects, however, the dyadic fixed effects cannot adequately control for the time-varying multilateral resistance term, the computed proxy variable as based on equation (2) was included. The results in columns 2 and 3 indicate that among the PTAs granted to the ACP group of countries, the EU PTA was the most effective in increasing bilateral exports to the EU countries. Although the PTAs by Canada and the US were positive, they were not statistically significant.

The ineffectiveness of the Canada, Japan and US PTAs delineates the salient components of the schemes in terms of generosity (product coverage, preference margin, quantitative restrictions) and stability (contractual and legally-binding nature). In comparison, the US PTA granted market access for about 4,800 products and provided zero tariffs for all eligible products but with quantitative limits. Exports to the US above these limits were dutiable at MFN rates. Additionally, certain products such as textiles and apparel, watches, footwear, handbags, luggage, flat goods,

work gloves and other leather wearing apparel, steel, glass and electronic equipment were labelled as import-sensitive, thus did not attract the PTA rates. It basically excluded products that LDCs have comparative advantages in and import-sensitive products cannot be made eligible. For Japan, the PTA offered preferential access for only 3,478 agricultural and industrial products. The tariff concessions vary according the eligible products from a 20 to a 100% reduction in MFN rates. This culminated in less than 30% of the value of dutiable imports receiving trade preferences (UNCTAD, 2001). Under the Canadian PTA, goods covered by PTA received a variable margin of preference from the MFN rates across products. All these other PTAs excluded the sensitive products. UNCTAD (2001) indicates that the major constraining factor for these PTAs is the lack of product coverage rather than the utilization of these trade preferences.

The contractual and legally binding preferential market access matters as this can minimize unilateral revocation of preferences. The contractual nature guarantees stability and security of the preferential market access. For example, the US PTA until African Growth and Opportunity Act specifically was criticized because of high level of unilateralism (Özden and Reinhardt, 2005). The US PTA also unilaterally drops beneficiary countries, culminating in about 42 LDCs withdrawals. The US scheme was also characterized by instability as the scheme elapsed on some occasions (Romalis, 2007). Özden and Reinhardt (2005) indicate that the anticipation of these uncertainties and constraints with US PTA dampens exports to US markets.

In contrast, the EU PTA provides a more extensive concession in terms of product coverage. Within the EU PTA beneficiaries is the ACP group of states that traditionally enjoyed more substantial benefits with a more generous market access conditions under the Lome´/Cotonou Agreement compared to the general arrangement. Typically, the EU-ACP framework extends beyond just creating market access as it incorporates mechanisms targeted at promoting industrialization, food security and self-sufficiency, diversification of ACP economies, promotion

of the private sector and increasing regional cooperation. It also focuses on building strong institutions such as human rights, democracy and good governance, strengthening of the position of women, protection of the environment and decentralized cooperation,

4.2 *Market access and economic development*

In this section we focus on how market access can explain the cross-country differences in the level of development. However, based on the results from Table 1, of which we found out that only EU PTA has a significant positive impact in fostering exports of LDCs, we constructed the MA index from each ACP country to each of the 27 EU member countries. Merging the constructed market access data with specific country variables produces comprehensive data for development accounting to assess the proximate determinants of per capita income level differences. In this development accounting, we hypothesize market access as a basic determinant of income level. Just as argued by Acemoglu et al. (2005) that the historically rapid economic development of Western Europe was due to access to Atlantic trading countries, we also argue the reversal that market access to these European countries can explain the income level differences.

Figure 1 provides anecdotal evidence on the relationship between market access and income levels. It is positively sloped indicating that countries with a higher market access experience higher income levels. This positive relationship is corroborated with a positive correlation coefficient of 0.34. This correlation coefficient is stronger compared to the estimate by Bosker and Garretsen (2012) who look at Sub-Saharan African domestic and foreign market access. However we cannot impute a causal relationship from this diagrammatic relationship, hence, we move to the econometric models.

[Insert Figure 1 here]

In estimating equation (5), reverse causality could be a problem if market access does not only influence GDP per capita, but in turn GDP per capita influences market access. For instance, a country with relatively higher income per capita and productivity would enjoy greater market access to DCs as it can tailor goods that are of high quality to meet the high tastes and preferences of consumers in DCs. Hoekman and Nicita (2011) confirm this argument in which they indicate that middle income countries enjoy more favorable market access in DCs. By and large, the problem of endogeneity resulting from reverse causality requires more than the use of fixed effects in accounting for it. In many cases, the recommended standard approach is the use of instrumental variables in a two-stage regression. The decision about the choice of instrumental variable is very complex and daunting. Wooldridge (2010) indicates that weak instruments can result in a more asymptotic bias compared to using the endogenous variables in structural estimations. In relation to NEG literature, some of the proposed instrument variables included geographic centrality proposed by Head and Mayer (2006). Bosker and Garretsen (2012) also use distance to most important markets as an instrument. However, the use of these instrumental variables is limited to cross-sectional data as they do not vary over time.

Considering the unsuitability of these aforementioned instruments in case of panel data, we resorted to the use of lag values of the possible endogenous variable as an instrument. Using lag variables to control for potential simultaneity and reverse causality has been identified by Clemens et al. (2012) as a more transparent and efficient than using weak instruments. Thus, we lag the market access variable by one period to account for the fact the market access variable may not have a contemporaneous effect on economic development.

[Insert Table 2 here]

Within the framework of a basic Solow model, we found that physical capital, human capital and population growth rate are the most relevant determinants of the level of economic development when the country fixed effects are included. Under the general assumption that unobserved individual country heterogeneity is uncorrelated with the regressors as in column 1, we find that, in exception of market access which is significant but with negative effect, all the other variables have expected signs and are strongly significant. However, excluding the country fixed effects would produce bias and spurious results because of possible endogeneity, in the sense that country-specific characteristics such as cultural, historical and social factors are not explicitly controlled for in the model. These factors would be subsumed into the idiosyncratic error term, leading to breakdown of the exogeneity condition. Accounting for the endogeneity using observable country-specific characteristics such as agriculture to GDP ratio, percentage of urban population, value added of oil to GDP and a measure of institution and policy using the Polity IV, does not adequately deal with the problem as cultural and historical values which are unobserved cannot be explicitly controlled for. Although the adjusted R-square increased significantly under column 2, which is indicative of a good measure of fitness of the model, the use of these observed time-variant country-specific characteristics does not suffice. In column 2, the size of the elasticities changes but the signs and significance are very similar to column 1. In column 3, we include the county fixed effects, and in column 4, we add the observable country characteristics. The results in columns 3 and 4 delineate that market access to EU is both of economic and statistical significance in determining the level of economic development in the ACP states.

Augmenting the country fixed effects with the time-variant country-specific variables as in column 4 strengthen the effect of market access in terms of an increase in size and significance level of the coefficient. In column 4, *a 1% increase in a country's market access to EU leads to a 0.0406% increase in the GDP per capita*. The results from our study contrast with that of Bosker

and Garretsen (2012) in terms of the effect of foreign market access. Although, Bosker and Garretsen find a positive effect of market access on economic development, they conclude that in terms of foreign market access, only African regional market access is important compared to advanced countries' markets or countries outside of Africa (which also include EU). For the OECD countries, Boulhol and de Serres (2010) find a comparable but higher estimate increase of 0.086% in GDP per capita with a 1% increase in market access to the advanced countries' markets. Confirming the relevance of market access to economic development of LDCs in a specific country case is Redding and Venable (2004) estimation that a country like Zimbabwe stands to see a significant improvement in its GDP per capita about 80% if Zimbabwe has unlimited market access to the EU.

In terms of the basic determinants, physical capital and the rate of population growth remain consistent in terms of sign in all the different models. In columns 3 and 4, we find that the human capital has a negative effect on GDP per capita, although statistically significant; the effect is not economically significant. Across all the models is the identification of the fact that the effect of market access is similarly as important as physical capital in the determinants of economic development. Thus, the results give credence to the use of exports as the main the engine for the development of LDCs.

4.3 *Foreign aid, market access and economic development*

Apart from the more generous, stable and secured preferential market access under the EU-ACP scheme, it also incorporates several developmental strategies that can propel the rate of economic development. Within the EU-ACP framework, the EU is supposed to provide sustainable support, institutional reforms and investments that would facilitate increased productivity and accelerate an equitable economic development through European Development Fund. In assessing the role of

foreign assistance reducing the supply-side constraints to complement market access, we estimate equation (6). Because of serious endogeneity concern in aid-growth literature, we lag the aid variable and market access index in accordance with Clemens et al. (2012).

The results based on the 50^{th} percentile threshold for defining low- or high-aid receiving countries are reported in Table 3a and the conditional marginal effects in Table 3b. Because of the multiplicative interactions terms, the conditional marginal effects provide a more nuanced result. In columns 1 and 2 of Table 3a, we report foreign aid disbursement from the EU whiles in columns 3 and 4 capture disbursement from all donors. Focusing separately on foreign aid, the result indicates foreign aid may have adverse effect on the exportable sector of the economy. This is consistent with Rajan and Subramanian (2011). Our main variable of interest, the interaction term between market access and aid, is also negative, which shows in Table 3b that market access does not have a greater significant positive effect in high-aid receiving countries compared to low-aid receiving countries.

[Insert Table 3a here]

[Insert Table 3b here]

However, increasing the threshold for the aid indicator variable from 50^{th} to $75^{th,}$ changes the results qualitatively and quantitatively as the coefficient of the interaction term changes to positive. This highlights that for foreign aid to complement market access more effectively the level of foreign aid targeted to support trade-related projects and trade-supportive infrastructures significantly matters. The results are shown in Table 4a and conditional marginal effects in Table 4b. Supporting market access with foreign aid produces a positive outcome, in that market access has stronger effect in preference-receiving countries that receive higher amount of foreign aid from the EU and other donors compared to low-aid receiving countries. This is consistent with Silva and

Nelson (2012) assertion that the higher amounts of foreign aid used to support trade-related projects and built infrastructures would enhance the export competitiveness.

[Insert Table 4 here]

[Insert Table 4a here]

4.4 Robustness

In Tables 5a and 5b, we conduct a robustness of our results by excluding oil-rich countries such as Nigeria, Angola and Congo and observations for which oil rents as a percentage of GDP is greater than 10%. By excluding these countries, we minimize the adverse effect of Dutch disease which Rajan and Subramanian (2011) identified as the main channel hampering the export competitiveness of developing countries. This is important as the Dutch disease is more associated with oil producing developing countries. In doing so, the effect of market access becomes considerably and significantly larger in high-aid receiving countries compared to low-aid receiving countries.

[Insert Table 5a here]

[Insert Table 5b here]

5 Conclusion

Generally, we have demonstrated in our paper three salient points; (1) the relevance of preferential trade agreements in fostering LDCs' exports to DCs' markets; (2) how preferential trade agreements increase market access and contribute significantly to economic development of least developed countries, and (3) the effectiveness of foreign aid in reducing the supply-side constraints

in PTA beneficiaries in order for them to utilize the market access opportunity. To provide an empirical evidence in support of the salient points, we used the gravity model to assess the effectiveness of preferential market accesses granted to ACP countries by the EU, the US, Canada and Japan. Furthermore, on the basis of new economic geography theory, we construct a market access index and within the framework of an augmented Solow model, we examine the significance of market access to economic development.

We find that preferential access to the EU is more important vis-à-vis other schemes and that market access to the EU is an important determinant of the level of economic development. Interestingly, we find that market access is as important as investment in explaining cross-country differences in the level of economic development. The EU preferences being most effective may suggest that preferential trade agreements which are contractual and legally binding on preference-giving countries are more effective in increasing exports to donor countries. In this respect, the contractual nature of EU-ACP PTA gave the scheme more stability and security and therefore made it relatively more effective.

Equally, we find that differential effect of market access on economic development between high- and low-aid receiving countries. This feature strongly suggests that complementing foreign aid with the grant of preferential market access would effectively benefit the preference-receiving countries. This is relevant as the provision of foreign aid in the form of developmental and technical assistance would effectively reduce the production capacity constraints on the supply-side to enable preference beneficiaries to effectively utilize the market access opportunities. The results from this paper provide an interesting side to the aid effectiveness debate as we have demonstrated that foreign aid could be more effective if it is combined with the granting of preferential market access that is contractually binding, more secure and with extensive product coverage.

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Table 1: Comparative assessment of Quad Preferential Trade Agreements

VARIABLES	**PPML**	**XT-PPML**	**XT-PPML**
	(1)	(2)	(3)
Log exporter GDP	1.461***	0.620***	0.631***
	(0.0340)	(0.119)	(0.124)
Log importer GDP	0.936***	0.121	0.170
	(0.0595)	(0.166)	(0.176)
Log distance	-0.590***		
	(0.0751)		
Log exporter population	-0.303***	0.479	0.0698
	(0.0207)	(0.470)	(0.408)
Log importer population	-0.0571	3.422***	3.838***
	(0.0647)	(1.169)	(1.031)
Colonial ties	0.688***		
	(0.112)		
Common language	0.196**		
	(0.0983)		
PTA-Canada (lag)	0.123	-0.0415	-0.341
	(0.145)	(0.379)	(0.380)
PTA-EU (lag)	0.480***	0.606**	0.585**
	(0.0932)	(0.238)	(0.241)
PTA-Japan (lag)	-0.232*	-0.0288	-0.128
	(0.138)	(0.408)	(0.452)
PTA-US (lag)	1.060***	0.0443	-0.169
	(0.137)	(0.181)	(0.288)
Constant	0.576		
	(0.893)		
Observations	51,540	50,960	50,960
Country pairs id		1,711	1,711
Dyadic FE	No	Yes	Yes
Time FE	Yes	Yes	Yes
MRT	No	No	Yes

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 2: Effect of market access on economic development

VARIABLES	(1)	(2)	(3)	(4)
Log market access (lag)	-0.0283**	-0.0547***	0.0374**	0.0406***
	(0.0126)	(0.0105)	(0.0161)	(0.0150)
Log physical capital	0.332***	0.142***	0.0705***	0.0524***
	(0.0201)	(0.0172)	(0.0115)	(0.0105)
Human capital	0.00901***	0.00140**	-0.00263***	-0.00199***
	(0.000729)	(0.000636)	(0.000925)	(0.000673)
Log population growth	-0.564***	-0.401***	-0.0140	-0.00868
	(0.0326)	(0.0267)	(0.0286)	(0.0255)
Agriculture as % of GDP		-0.0261***		-0.0121***
		(0.00144)		(0.00205)
Urbanization rate		0.00824***		0.00724**
		(0.00125)		(0.00310)
Polity IV		0.0130***		-0.00161
		(0.00309)		(0.00250)
Oil as % of GDP		0.00761***		0.00405
		(0.00132)		(0.00274)
Constant	3.562***	4.181***	6.592***	6.893***
	(0.418)	(0.357)	(0.532)	(0.506)
Observations	1,104	1,050	1,104	1,050
Adjusted R-squared	0.632	0.784	0.933	0.939
Time fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	Yes	Yes

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 3 Effects of market access and foreign aid on economic development, using 50th percentile for aid classification

VARIABLES	(1)	(2)	(3)	(4)
Log market access (lag)	0.0319**	0.0420***	0.0317**	0.0402***
	(0.0160)	(0.0150)	(0.0156)	(0.0146)
EU aid dummy (lag)	-0.188***	-0.164***		
	(0.0410)	(0.0358)		
Log market access* EU aid (lag)	-0.00176	-0.000189		
	(0.00127)	(0.00119)		
All donors aid dummy (lag)			-0.191***	-0.168***
			(0.0379)	(0.0320)
Log market access* All donors dummy (lag)			-0.00207*	-0.000337
			(0.00121)	(0.00116)
Log physical capital	0.0695***	0.0516***	0.0685***	0.0504***
	(0.0112)	(0.0103)	(0.0109)	(0.0100)
Human capital	-0.00188**	-0.00154**	-0.00197**	-0.00179***
	(0.000852)	(0.000663)	(0.000840)	(0.000655)
Log population growth	-0.0114	-0.00640	-0.0195	-0.0170
	(0.0294)	(0.0258)	(0.0285)	(0.0252)
Agriculture as % of GDP		-0.0128***		-0.0131***
		(0.00197)		(0.00196)
Urbanization rate		0.00594**		0.00606**
		(0.00302)		(0.00305)
Polity IV		0.000163		-0.000265
		(0.00247)		(0.00240)
Oil as % of GDP		0.00288		0.00210
		(0.00259)		(0.00262)
Constant	6.444***	7.064***	6.444***	7.034***
	(0.527)	(0.508)	(0.512)	(0.488)
Observations	1,104	1,050	1,104	1,050
Adjusted R-squared	0.935	0.941	0.935	0.942

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, time and country dummies are included

Table 3a Conditional marginal effects of market access in low and high aid receiving countries

	Low-aid countries (from EU)	High-aid countries (from EU)	Low-aid countries (all donors)	High-aid countries (all donors)
Market access (with basic control variables)	0.0319*	0.0301	0.0317*	0.0296
	(0.0160)	(0.0162)	(0.0156)	(0.0156)
Market access (with all control variables)	0.0420**	0.0418**	0.0402**	0.0398**
	(0.0150)	(0.0153)	(0.0146)	(0.0146)

Table 4 Effects of market access and foreign aid on economic development, using 75th percentile for aid classification

VARIABLES	(1)	(2)	(3)	(4)
Log market access (lag)	0.0398**	0.0462***	0.0413**	0.0460***
	(0.0159)	(0.0148)	(0.0160)	(0.0148)
EU aid dummy (lag)	-0.109**	-0.0965***		
	(0.0427)	(0.0360)		
Log market access* EU aid (lag)	0.00122	0.00213		
	(0.00150)	(0.00135)		
All donors aid dummy (lag)			-0.135***	-0.107***
			(0.0516)	(0.0408)
Log market access* All donors dummy (lag)			0.00185	0.00258*
			(0.00165)	(0.00140)
Log physical capital	0.0679***	0.0504***	0.0630***	0.0466***
	(0.0111)	(0.0105)	(0.0107)	(0.0104)
Human capital	-0.00252***	-0.00203***	-0.00275***	-0.00223***
	(0.000864)	(0.000659)	(0.000837)	(0.000642)
Log population growth	-0.0269	-0.0237	-0.0293	-0.0244
	(0.0290)	(0.0256)	(0.0279)	(0.0250)
Agriculture as % of GDP		-0.0127***		-0.0120***
		(0.00199)		(0.00187)
Urbanization rate		0.00723**		0.00653**
		(0.00299)		(0.00309)
Polity IV		1.35e-05		0.000111
		(0.00248)		(0.00250)
Oil as % of GDP		0.00313		0.00345
		(0.00270)		(0.00268)
Constant	6.727***	7.178***	6.816***	7.192***
	(0.522)	(0.496)	(0.528)	(0.502)
Observations	1,104	1,050	1,104	1,050
Adjusted R-squared	0.934	0.941	0.935	0.941

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, time and country dummies are included

Table 4a Conditional marginal effects of market access in low and high aid receiving countries

	Low-aid countries (from EU)	High-aid countries (from EU)	Low-aid countries (all donors)	High-aid countries (all donors)
Market access (with basic control variables)	0.0398*	0.0410**	0.0413**	0.0432**
	(0.0159)	(0.0157)	(0.0160)	(0.0156)
Market access (with all control variables)	0.0462**	0.0483**	0.0460**	0.0486***
	(0.0148)	(0.0148)	(0.0148)	(0.0147)

Table 5a Effects of market access and foreign aid on economic development, using 75th percentile for aid classification and without oil-rich countries

VARIABLES	(1)	(2)	(3)
Log market access (lag)	0.0451***	0.0439***	0.0464***
	(0.0157)	(0.0156)	(0.0158)
EU aid dummy (lag)		-0.0674**	
		(0.0317)	
Log market access* EU aid (lag)		0.00261**	
		(0.00125)	
All donors aid dummy (lag)			-0.0576
			(0.0353)
Log market access* All donors dummy (lag)			0.00367***
			(0.00121)
Log physical capital	0.0501***	0.0482***	0.0463***
	(0.0103)	(0.0102)	(0.0102)
Human capital	-0.00197***	-0.00209***	-0.00236***
	(0.000696)	(0.000685)	(0.000681)
Log population growth	0.00510	-0.0138	-0.0143
	(0.0262)	(0.0264)	(0.0256)
Agriculture as % of GDP	-0.0100***	-0.0104***	-0.00982***
	(0.00168)	(0.00164)	(0.00151)
Urbanization rate	0.00443	0.00600	0.00486
	(0.00365)	(0.00374)	(0.00371)
Polity IV	-0.00508*	-0.00325	-0.00360
	(0.00265)	(0.00264)	(0.00264)
Oil as % of GDP	-0.00589	-0.0111	-0.0129
	(0.0111)	(0.0131)	(0.0127)
Constant	6.933***	6.948***	7.059***
	(0.511)	(0.513)	(0.521)
Observations	903	896	896
Adjusted R-squared	0.930	0.931	0.931

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, time and country dummies are included

Table 5b Conditional marginal effects of market access, without rich-oil countries.

	Low-aid countries (from EU)	High-aid countries (from EU)	Low-aid countries (all donors)	High-aid countries (all donors)
Market access (with all control variables)	0.0439***	0.0465**	0.0464**	0.0501***
	(0.0156)	(0.0156)	(0.0160)	(0.0156)

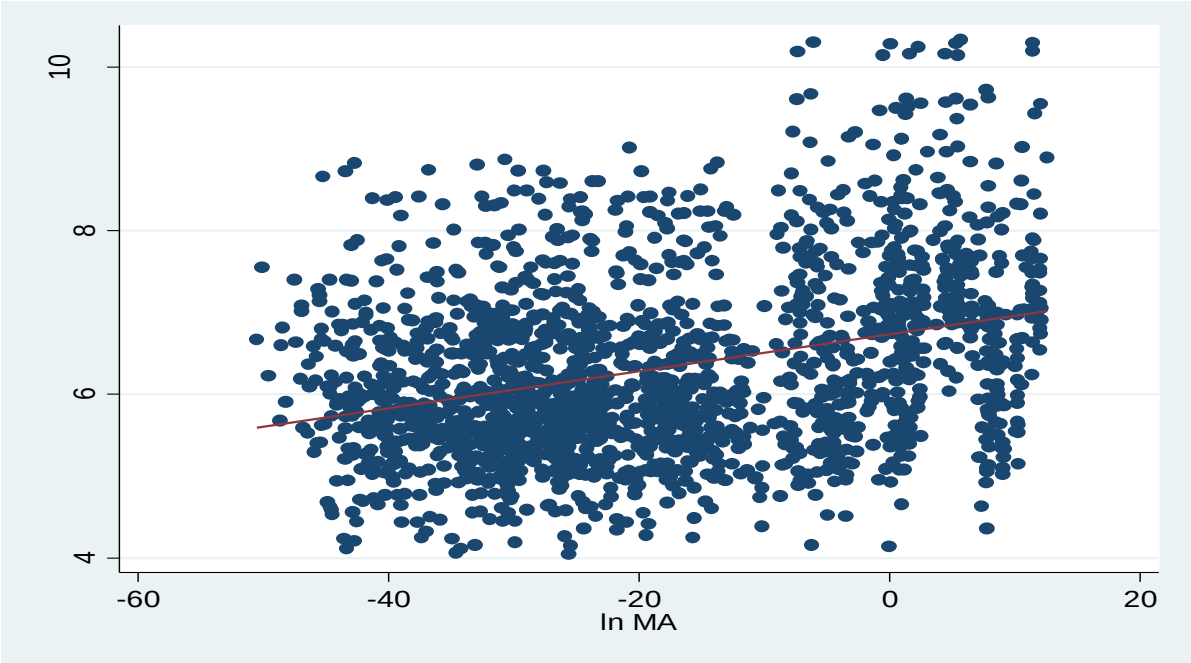

Figure 1: Relationship between market access and economic development

Appendix

A1. ACP beneficiaries

Angola	Madagascar
Bahamas	Malawi
Barbados	Mali
Belize	Mauritania
Benin	Mauritius
Burkina Faso	Mozambique
Burundi	Niger
Cameroon	Nigeria
Cape Verde	Papua New Guinea
Central African Republic	Rwanda
Chad	Saint Kitts and Nevis
Comoros	Saint Lucia
Congo	Saint Vincent and the Grenadines
Côte d'Ivoire	Samoa
Djibouti	Sao Tome and Principe
Dominica	Senegal
Dominican Republic	Seychelles
Ethiopia	Sierra Leone
Equatorial Guinea	Solomon Islands
Fiji	Somalia
Gabon	Sudan
Gambia	Suriname
Ghana	Tanzania (United Republic of)
Grenada	Togo
Guinea	Tonga
Guinea-Bissau	Trinidad and Tobago
Guyana	Tunisia
Haiti	Uganda
Jamaica	Zambia
Kenya	Zimbabwe
Liberia	

Source: UNCTAD (2011)

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