

# Revisiting the Short and Long-Run Impacts of Trade Openness: Evidence from the African Growth Experience

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## Abstract

It is well established that international trade can impact economic growth directly through economies of scale and diversification, or indirectly through technological diffusion. There can, however, be differences in the impacts based on the various components of trade openness and the period under consideration. Most of the existing literature on the impact of trade on the African economic growth experience has primarily focused on the aggregate impact of trade, ignoring the differences in the components and the direction of trade. Using a panel dataset of 28 African countries over the 1980-2016 period, this study investigates the short and long-run impacts of the various trade openness components by employing the recently developed dynamic common-correlated effects panel model with heterogeneous coefficients. We find that services import only have a short-run positive impact on economic growth, while merchandise imports and service exports exhibit long-term positive impacts on growth. We also find that overall trade openness is beneficial for economic growth, but its impact is short lived.

JEL Classification: F13, F14, F14, 040

Keywords: *Trade openness, economic growth, dynamic common-correlated effects panel model, Africa*

# **Revisiting the Short and Long -Run Impacts of Trade Openness: Evidence from the African Growth Experience**

## **1. Introduction**

Many previous empirical studies have shown that international trade can potentially have a positive and statistically significant impact both on the level and rate of growth of GDP per capita of developing countries (Rivera-Batiz & Romer, 1991; Barro & Sala-i-Martin, 1997; Nannicini and Billmeier, 2011; Zahanogo, 2016; Keho, 2017). On the other hand, there are studies which cast doubt suggesting openness to trade may have no impact, or even negative impact on growth in countries with low financial development (Keho, 2017). Testing whether the benefits of trade for growth vary over time and across countries, Dowrick and Golley (2004) confirm the findings of previous studies that specialization in primary goods has a negative impact on growth. For a host of different reasons, the findings of previous studies on the impact of trade on growth have been mixed.

Most of the previous studies on the linkage between African economic growth and trade openness have either focused on overall trade, or merchandise exports with a varying degree of outcomes ranging from significantly positive, no significant impact, to significant negative impacts. The inconclusive outcomes from these studies may be due to many factors ranging from inefficient models, usage of wrong trade openness proxies, to an issue of overreliance on aggregate trade data. In order to address other possible reasons for inconclusive outcomes, our study contributes to the literature by disentangling the differential impacts of the various measures of openness to trade on growth. Typically, openness to trade is measured by the ratio of the sum of the value of exports

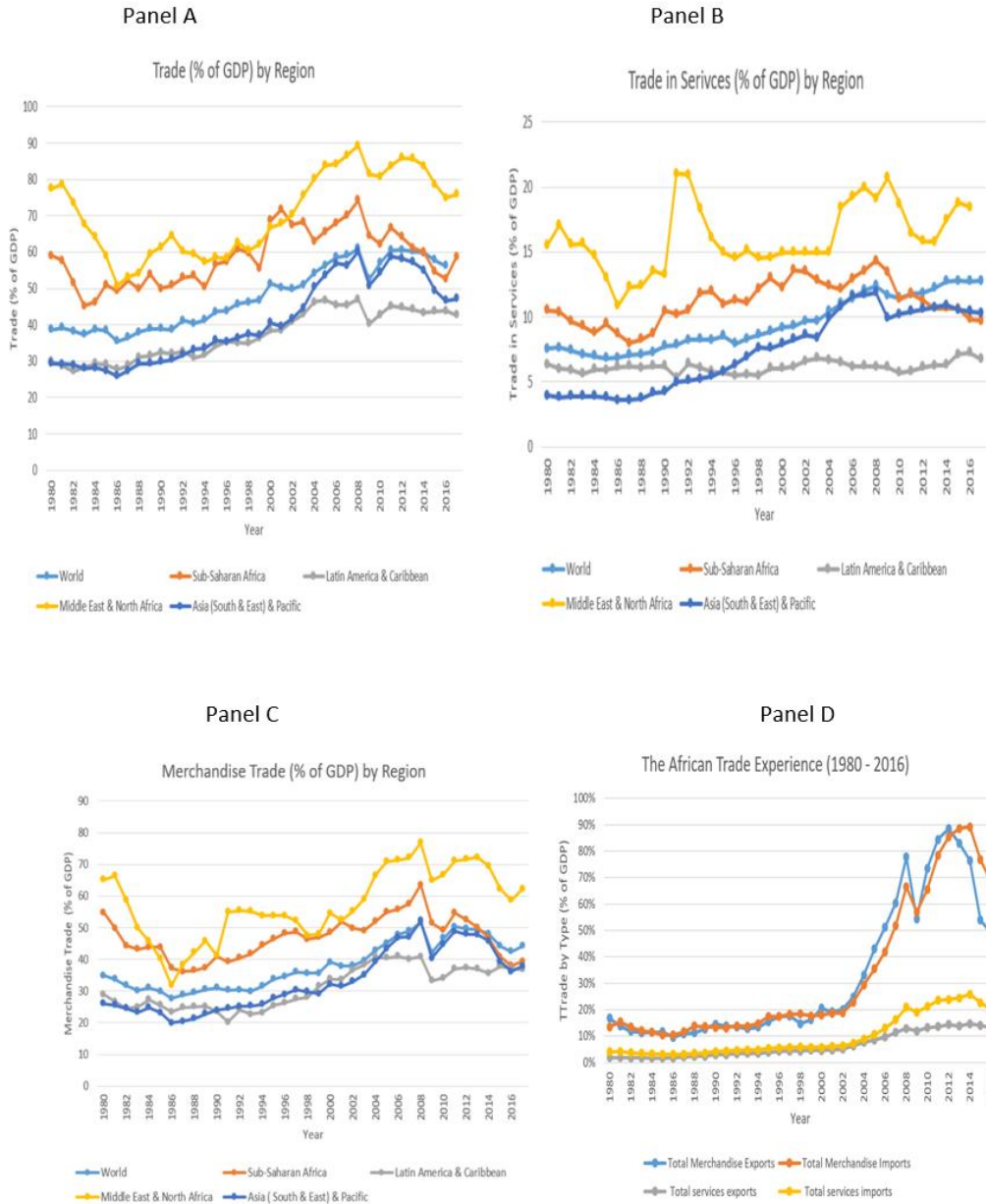
and imports as a percent of GDP. Prior to our empirical exercise on the impact of trade openness on growth, we examine the trends in the measures of trade openness for Africa relative to the other regions of the world using the panels A to D in Figure 1 below. From panel A through C, we can see that from 1980 through to 2017 sub-Saharan Africa beat the world average measure of openness for all of the major categories of openness, only exceeded by the Middle East and North Africa (MENA) region. Over our study period, world trade as a % of GDP has increased from 38.7% in 1980 to 54.2% in 2016 (1.4 times).<sup>1</sup> In Panel A, we observe that trade openness in sub-Saharan Africa as a percent of GDP started at 60% in 1980 and then leveled off until the mid 1980s. It experienced moderate upward trend reaching about 70% in 2000 and then declining thereafter during the worldwide financial crisis of the 2008, reaching about 50% in 2016. It is interesting to note that sub-Saharan Africa's overall trade as a percentage of its GDP was higher than Asia and the rest of the world, only to be exceeded by the MENA countries (Panel A). In panel B, we observe that merchandise trade as a percent of GDP for sub-Saharan Africa started at 55% in 1980 and continued to decline until the late 1980s beyond which it rose to over 60% until the 2008 financial crisis, and then declining thereafter, reaching below 40% in 2016. In Panel C, sub-Saharan Africa trade in services was a little over 20% of its GDP in 1994 and barely rose until 2000 and dipping to 10% and remaining the same until 2004 and rising sharply until 2005 and then ending below 30% in 2016. Panel D shows the dollar values of the trade components for Africa including total merchandise exports and imports and total service exports and imports. Respectively, total merchandise exports and imports rose from about \$10 billion in 1980 to \$65 billion in 2013 and leveling off thereafter. We also observe that both the values of total merchandise exports and imports pretty much moved together throughout most of the study period. The value of total service exports and imports rose from an almost insignificant amount in 1980 to \$5 billion in 2004

\$10 billion and \$15 billion in 2016, respectively. From these trends, one can clearly, deduce that African economies are very open to trading and it is important to provide a holistic analysis of the impact of trade openness on growth, unlike the prevailing conventional views may suggest. We contribute to the existing literature by focusing on the decomposed impacts of various aspects of openness to trade on the per capita income growth of the African region in both their short and long run.

The objective of this paper is to decompose our measure of openness to trade (total trade as a percent of GDP) into total exports and imports, merchandise exports and imports and total service exports and imports with the aim of observing their short and long-run impacts on the economic growth experience of a cross-section of 28 African countries over the 1980-2016 period. We also decompose services trade into commercial and other services imports and exports. Our preliminary results suggest that: (1) the broad measure of openness to trade has a positive and significant effect on growth in the long-run and a negative, but insignificant effect on growth (Model 1); (2) Merchandise trade has a positive and significant effect on growth in the long-run, negative, but insignificant effect in the short-run (Model2); (3) Exports of goods and services has a positive and significant effect on growth in the long-run, but negative and insignificant effect in the short-run (Model 3); (4) total services imports have a negative, but insignificant effect on growth in the long-run and positive and significant effect on growth in the short-run; (5) total merchandise imports have a positive and significant effect on growth both in the long and short-run (Model 5); (6) total merchandise imports have a positive and significant effect on growth both in the long and short-run (Model 6); (7) commercial services have a positive and significant effect on growth in the long-run, but insignificant effect on growth in the short-run (Model 7); (8) other services exports have a positive and significant effect on growth in the long-run, but negative and

insignificant effect on growth (Model 8); and finally (9) finally total commercial services have a positive and significant on growth in the long-run, but positive and insignificant effect of growth in the short-run (Model 9).

**Figure 1. The State of African Trade Openness Trends**



Data Sources: World Development Indicators and World Trade Organization's World Trade Statistics.

The rest of the paper is organized as follows. Section II provides a review of selected literature. In section III, we first specify a conventional neoclassical growth model which incorporates openness to trade as our variable of interest and one of the sources of economic growth. In Section III, we specify a simple Cobb-Douglas type model and describe the data. Section IV presents and discusses the empirical results. The last section summarizes the results, draws conclusions based on the results, and speculates some policy recommendations for promoting openness to trade as a growth and development strategy.

## **2. Literature Review**

The theoretical and empirical literature on the sources of economic growth is replete with various factors including investment in physical and human capital, foreign aid including overseas development assistance (ODA) and aid-for-trade from bilateral and multilateral sources, foreign direct investment (FDI), the institutional quality of the country (governance), openness of the economy (typically measured as a ratio of the sum of exports and imports to the real GDP of a country), and a host of other factors of economic growth (Solow, 1957; Lewis, 1989; Lucas, 1988; Barro, 1991, Mankiw et al., 1992). As of yet, not many studies have focused on the growing contribution of the various components of trade openness to the economic growth of emerging economies in general, and Africa, in particular.

A growing body of literature has documented the economic growth promoting impact of openness to trade since studies Romer (1990), Grossman and Helpman (1990), and by Young (1991). Many empirical studies have since reached the conclusion that trade openness has the potential for enhancing the long-run economic growth of countries by allowing them access to goods and services and enhancing the efficiency in the allocation of resources, and promoting productive efficiency through technological diffusion and the dissemination of knowledge and ideas (Rivera-Batiz & Romer, 1991; Barro & Sala-i-Martin, 1997).

For over half a century, the contribution of trade openness to the economic growth of developing countries has attracted numerous theoretical and empirical studies. From the theoretical perspective, the basic argument is that if countries focus in the production of goods and services in which they have comparative advantage (cost-effective) and engage in free trade with each other, the result would be increased world production due to specialization and division of labor which allow increased consumption among trading partners.

Owing to the fact that trade based on the principle of comparative advantage tends to relegate developing countries to heavy reliance on the exports of a few primary materials and the foreign exchange earnings from such trade activities were low and often fluctuating. Consequently, many developing countries favored the import-substitution industrialization strategy in order to arrest the hemorrhaging of their foreign exchange earnings in the form of imports of manufactured goods and services as it occurred in Argentina, Mexico, Brazil (Aspra, 1977). Such inward-oriented industrialization policy was later repudiated on the ground of inefficiency in resource allocation and was later replaced by export-led industrialization strategy (outward trade orientation) which promoted exports as the engine of economic growth.

Standard theory predicts that trade openness fuels economic growth in the long run as illustrated by the growing body of literature that has documented the economic growth-promoting impact of openness to trade since studies Romer (1990), Grossman and Helpman (1990), and by Young (1991). Many empirical studies have since reached the conclusion that trade openness has the potential for enhancing the long-run economic growth of countries by allowing them access to goods and services and enhancing the efficiency in the allocation of resources, and promoting productive efficiency through technological diffusion and the dissemination of knowledge and ideas (Rivera-Batiz & Romer, 1991; Barro & Sala-i-Martin, 1997). The trade led growth tenet of modern trade theories as proposed by leading authors including Helpman and Krugman (1985) and Romer (1986) accentuates the possible dynamic positive trade attributes which improve a country's production possibilities. According to these authors, increased openness to trade, not only encourages private entrepreneurship, but also causes learning by doing, leads to the acquisition of new

technology and skills, and encourage entrepreneurship, and sustain economic growth. Ricardo's competitive advantage theory and the new growth theory assert that trade plays a crucial role in economic growth. While Ricardo's theory links growth with openness to trade via the relocation of resources to productive sectors (comparative advantage), the new growth theory asserts that trade impacts growth via endogenous technological diffusion, innovation, and capital formation which leads to increased productivity across sectors.

From the Ricardian classical theory camp, for example, Bhagwati (1978), Greenaway et al. (2002) and Falvey et al. (2012) find evidence of specialization via comparative advantage leading to economic growth. Several of the previous studies have focused on the link between growth and overall trade. For example, Romer (1990) argues that trade openness brings in a variety of production increasing innovations, ultimately leading to growth. Frankel and Romer (1999) on the other hand argue that trade impacts growth primarily through improvements in productivity. Kim and Lin (2009) find a positive relationship between trade and long-run growth to be dependent on the level of economic development. From the above, one can deduce that most empirical studies based on cross-country growth regressions suggest a significant growth promoting the effect of trade openness (Edwards, 1998; Miller and Upadhyay 2000; Ahmed et al., 2011; Le Goff and Singh, 2014). However, some studies suggest a non-linear relationship between trade and economic growth. For example, Agénor (2004) and Liang (2008) argue that there exists an income threshold below which the impact of trade on growth is negative and positive afterward.

After several decades of trade openness improvements since the 1960s in Africa, evidence for the trade led growth hypothesis remains mixed. These mixed results may be due to several reasons. For example, a section of the previous studies indicates that the relationship between growth and trade openness can be negative for African countries. According to Mullings and Mahabir (2018), the impact of trade openness on growth can be negative if institutional imperfections lead to trade causing underutilization of domestic human and physical capital and natural resources, or lead to the concentration of resources in extractive industries, and or lead to a movement technologically advanced increasing returns industries. According



to them, these are the main explanations of the gloomy outcomes from some endogenous growth analysis including Eicher (1999), Grossman and Helpman (1991).

Fosu (1990) finds a positive link between exports and economic growth for African countries. Zahanogo (2016) finds a positive link between trade openness (measured by overall trade, exports, and imports), however, he finds an inverted U-curve in the relationship indicating a nonlinear relationship between trade and growth for sub-Saharan African countries. He also finds that trade openness has a positive and significant effect on economic growth only up to a threshold, above which the effect declines. Similarly, Foster (2006) indicates the existence of thresholds in the relationship between trade and the African growth experience which is dependent on factors such as a country's initial levels of per capita income, the share of exports in GDP, and the growth of exports. Sakyi et al. (2017) in their study of the impact of trade on growth for African countries employing three indicators including overall trade, export, and import related costs, constructed by using principal component analysis find that trade facilitation serves as an important channel through which trade affects economic growth. Using data from sub-Saharan African countries and Autoregressive Distributed Lag (ARDL) models, Ahmed et al. (2011) find that that exports and FDI have a significant impact on economic growth. In their analysis of trade between Africa and the EU, U.S., and China, Mullings and Mahabir (2018) note that despite some evidence of a positive impact of trade openness for Africa in fixed effects estimations, the results are not as robust when issues like endogeneity are accounted for in the models. On the import front, Asafu-Adjaye and Chakraborty (1999) find that the importation of intermediate and capital goods are important inputs in the production of exports in less developed countries, thus, leading to increased productivity.

Using firm-level data for Ghana, Kenya, Bresnahan et al. (2016) find the growth association between export intensity and firm productivity, with some hint of the mixed results for the "learning via exports" hypothesis. They explain that the negative total factor productivity for high exporting countries can be attributable to lower external tariffs because it moves the threshold of the productivity level associated with unprofitable exporting down. They also conclude that initial income and trading partner may contribute to

this negative association. Menyaha, et al. (2014) analyze the causal relationships between financial development and trade and economic growth for 21 African countries. They conclude that trade openness impedes economic growth while financial development stimulates economic growth. In addition to these studies on trade openness, a few studies have looked at specific areas of trade and their impact on the African growth experience. For example, Fayissa et al. (2008) find a positive impact of tourism trade on growth while Adams and Osei-Poku (2015) and Sakyi and Egyir (2017) find the positive foreign direct investments on growth.

As indicated by the growing assertions, the trade composition and flows are important for the growth/trade relationship, not just an overall trade expansion (See, Hausmann et. al., 2007). Hence, it is important to disentangle the growth impacts of trade via the composition and direction of trade. The above brief literature review, however, reveals that most of the existing literature on the link between trade openness and African economic growth only focuses on the overall impact of trade rather than the various measures of openness to trade. Our paper seeks to fill this relative void in the literature by examining the impacts on the growth of different measures of trade openness including merchandise and services exports and imports both in the short and long-run. We now turn to the next section in which we specify the empirical methodology and describe the data sources.

### **3. Empirical Methodology and Data**

#### **3.1 Empirical Model**

For our analysis of the differential impact of the various components of openness to trade on economic growth in Africa, we follow Keho (2017) and Shahbaz (2012) to specify a Cobb Douglas production function represented by Equation 1.

$$Y(t) = A(t)K(t)^\alpha L(t)^{1-\alpha} \quad (1)$$

Where  $Y(t)$ ,  $K(t)^\alpha$  and  $L(t)^{1-\alpha}$  denote the gross domestic output, capital stock and labor stock of the economy in question, respectively.  $A$  denotes the rate of technological progress or a measure of total factor productivity (TFP). Similarly, we extend the function by making the assumption that the main catalysts of technological progress include financial development, human capital accumulation, and openness to international trade. While capital and labor provide the capacity for the growth of the economies in question, technological progress enhances the marginal returns to these factors. For example, advances in technological progress are expected to increase the degree and scope of capital formation and also provide avenues for funding consumption and investments all which contribute to economic growth. Human capital formation is expected to improve the value added of labor in the economic growth process. Another important source of growth is the openness to trade of the economy. Openness to international trade may have two possible impacts on growth. First, from the expenditure type GDP equation, one can deduce that trade can directly impact economic growth through increases in exports, while imports may take away from domestic growth unless they are of trade generation type. On the other hand, trade can indirectly contribute to economic growth through the transfer of technological know-how from advanced economies to developing countries via learning effects. Thus, leading to the empirical technological progress model presented in Equation 2.

$$A(t) = \delta OT(t)^\tau FD(t)^\gamma HC(t)^\rho \quad (2)$$

Where  $\delta$ ,  $OT$ ,  $FD$ , and  $HC$  denotes the time invariant constant term, openness to trade, financial development, and human capital accumulation respectively. Substituting Equation 2 into Equation 1 and taking the logs of both sides and decomposing our variables yields the econometric model presented in Equation 3. The question becomes does all types of trade positively contribute to the

African growth experience? In order to answer this question, we have to analyze the differential impacts of different types of trade openness on the economic growth experience of African countries.

$$\ln Y_{it} = \alpha_{1i} + \alpha_2 \ln OT_{sit} + \alpha_3 FD_{it} + \alpha_4 HC_{it} + \alpha_5 K_{it} + \alpha_6 L_{it} + \varepsilon_{it} \quad (3)$$

Granted that the model presented in Equation 3 has often been used in previous literature, it may suffer from dynamic misspecification, thus, making it imperative to introduce dynamics into the model. Also, due to spatial macroeconomic linkages that exhibit themselves through reactions to common shocks, local spillover effects between countries, and similar institutions, cross-sectional dependence is a possibility. Not correcting for them may lead to biased parameter estimates and significance. There, however, is the possibility that different countries may react to the same shock differently, thus, leading to substantial heterogeneity, despite their similarities and proximity. Assuming homogeneity in such conditions can also lead to biased parameter estimates. In this case, the error term in Equation 3 can be identified as Equation 4 below:

$$\varepsilon_{it} = \pi_i' C_t + \mu_{it} \quad (4)$$

Where  $C_t$  and  $\pi_i$  denote an unobserved common factor and a heterogeneous factor loading, respectively. According to Pesaran (2006), Equation 3 can consistently be estimated by approximating the unobserved common factors with cross-sectional means of our explanatory variables in the case of strict exogeneity assumption. However, in dynamic models, the lagged dependent variable is not strictly exogenous, thus, leading to biased parameter estimates. Chudik

and Pesaran (2015), however, argue that the estimator becomes consistent when  $PT^1 = \sqrt[3]{T}$  cross sectional means are added.

In order to correct for these possible problems, we employ the Dynamic Common Effects Estimator (DCEE) as prescribed by Chudik and Peasaran (2015). The model is operationalized in STATA via the `xtdcce2` model developed by Jan Ditzen (2018). Specifically, we employed the Pooled Mean Group (PMG) estimator which according to Shin et al. (1999) is an intermediate between the pooled and the mean group estimators. The advantage of this model is that like the PMG (XTPMG) model used by Zahonogo (2016), it accounts for unobserved common factors, robust to nonstationarity, cointegration, breaks, and serial correlation. It is even more consistent because of the inclusion of the lags of the cross-sectional means. The model can be written as an error correction model as presented in Equation 5.

$$\Delta Y_{it} = \phi_i(Y_{it-1} - \theta_i X_{it}) + \delta_{0i} + \delta_{1i} \Delta X_{it} + \varepsilon_{it} \quad (5)$$

Where  $\phi_i$  denotes the error correction speed of adjustment, which is expected to be negative for convergence reasons. On the other hand,  $\theta_i$  and  $\delta$  denotes the long and short-run effects, respectively. For our analysis, we assume that the long-run effects are homogeneous, whereas the short-run effects are assumed to be heterogeneous.  $X_{it}$  denotes a vector of the explanatory variables used in analyzing our output variable. The model is estimated in log-form and as such provides both short and long-run elasticities. The advantages of employing this dynamic common-correlated effects panel model with heterogeneous coefficients are that they address the

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<sup>1</sup> Where PT Let's denote the number of lags.

Estimated equation:  $y_{it} = \lambda_i y_{i,t-1} + \beta_i x_{it} + \sum_{l=0}^{PT} \delta'_{il} \bar{z}_{t-1} + \varepsilon_{i,t}$ ; where  $\bar{z}_t = (\bar{y}_t, \bar{y}_{t-1}, \bar{x}_t)$

heterogeneity, non-stationarity, and cross-sectional dependence. Using the pooled mean group (PMG) option allows for dynamic common correlated effects and it allows for both homo and heterogeneous coefficients. Unlike other dynamic panel models, it also allows for endogenous repressors, supports both balanced and unbalanced panels, and corrects for small sample time series bias (Ditzen 2018).

## **2.2 Data**

We combine annual data from the World Bank's World Development Indicators (WDI), the World Trade Organization's (WTO) trade statistics, and the most recent Penn World Tables (PWT) to create a panel of 28 African nations over the 1980-2016 period. Our dependent variable from the WDI is the annual real per capita income of African countries over the study period. We employ the human capital index<sup>2</sup> and the number of people employed from the PWT as our proxies for the quality of workers and labor force, respectively. We also use the WDI's Domestic credit provided by the financial sector (% of GDP) as our proxy for the financial sector development. As mentioned earlier, we employ several aspects of openness to trade in order to analyze the differential impacts of various measures of the trade openness of a country. The trade openness proxies used include the following:

Overall trade (% of GDP), Merchandise trade (% of GDP), Merchandise exports (% of GDP), Merchandise imports (% of GDP), Trade in services (% of GDP), Exports of goods and services (% of GDP), Imports of goods and services (% of GDP), Services exports (% of GDP), Services imports (% of GDP), Commercial services exports (% of GDP), Commercial services imports (% of GDP), Other services exports (% of GDP), and Other services imports (% of GDP).

The variables are from various sources including the WDI, WTO, and IMF trade statistics. Originally, we planned to use all African countries in our analysis. However, the selection of

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<sup>2</sup> The Human Capital index from the Penn World Table version 9.0 is based on years of schooling and returns to education.

countries and years of coverage are purely based on data availability and quality. The variable descriptions, data sources, and summary statistics are presented in Table 1.

**Table 1. Variable Description and Summary Statistics**

Variable	Description	Mean	Std. Dev.	Min	Max
<i>PCI</i>	GDP per capita (constant 2010 US\$)	2075.99	2443.97	273.85	12665.98
<i>TRADE</i>	Trade (% of GDP)	66.68	28.58	6.32	188.65
<i>TRADEM</i>	Merchandise Trade (% of GDP)	52.66	24.88	6.82	183.03
<i>TRADES</i>	Trade in services (% of GDP)	14.04	12.42	0.00	62.67
<i>EXGS</i>	Exports of goods and services (% of GDP)	30.62	15.15	3.34	84.44
<i>IMGS</i>	Imports of goods and services (% of GDP)	36.01	15.41	2.98	114.05
<i>MIMP</i>	Total merchandise imports (% GDP)	10.22	21.48	0.12	181.61
<i>MEXP</i>	Total merchandise exports (% GDP)	9.31	21.19	0.01	165.68
<i>SERIM</i>	Total services imports (% of GDP)	2.70	5.10	0.01	35.21
<i>SEREX</i>	Total services exports (% of GDP)	2.17	4.83	0.02	35.58
<i>OSEREX</i>	Other services exports (% of GDP)	0.66	1.22	0.00	8.24
<i>OSERIM</i>	Other services imports (% of GDP)	1.13	2.13	0.00	14.50
<i>HC</i>	Huma capital index	1.61	0.41	1.01	2.86
<i>EMP</i>	Number of people engaged in employment activities	6.72	8.50	0.12	60.10
<i>GFCF</i>	Gross fixed capital formation (% of GDP)	19.51	7.37	-2.42	46.10
<i>DCREP</i>	Domestic credit to private sector (% of GDP)	21.41	18.08	0.45	106.26

Note: the data covers 28 African countries for the period spanning 1980-2016. The *PCI*, *GFCF*, *TRADE*, *TRADEM*, and *TRADES* variables are from the World Development Indicators. The other trade variables are from the World Trade Organization's World Trade Statistics, whereas the rest of the control variables including *HC* and *EMP* are from the Penn World Tables dataset.

## 4. Empirical Results and Discussions

### 4.1 Results

The results of our pooled mean group dynamic common effects estimator are presented in Tables 2 - 4. Note that the model is in double log form with the difference of the log of per capita income employed as the dependent variable for all models estimated for our analysis. We present the full long-run results for all of our models. For parsimony, however, we only present the short-run results for our variables of interest, the trade variables. It is important that we are able to provide both short and long-run policy recommendations based on the variables of interest. For all our models, the short-run error correction terms (*ec*) measure the speed of adjustment after a shock is significantly negative, thus, providing evidence of cointegration relationship between per capita

income and our control variables. This finding is indicative of evidence of mean reversion, or one of catch-up effect.

Table 2 presents the findings for the models that control for overall trade openness (Model 1), openness to trade in services and merchandise (Model 2), and openness to trade export of goods and services and import of goods and services (Model 3). The signs of our long-run estimates for our control variables are according to the theoretical expectation, with the exception of the gross fixed capital formation used as a proxy for physical capital none of the other variables are significant in any of our three models. Specifically, we find that while gross fixed capital formation has a positive impact in all models, it is only significant when we control for overall trade and also in the model that we control for the exports and imports of goods and services. In model 1, we find a positive long-run impact of trade openness on long-term economic growth of African countries similar to Zahonogo (2016), but not in the short-term. More specifically, we find that a 10 percent increase in overall trade as a percentage of GDP is associated with about 2.28 percent increase in the per capita income of African countries.

Model 2 splits up openness to trade into its two main areas (services and merchandise trade openness). We find that only openness to merchandise trade has a significant long-term impact on the economic growth of African countries and no significant short-term impacts of either measure of trade openness on economic growth. Specifically, we find that a 10 percent increase in merchandise trade as a percent of GDP, leads to 3.631% increase in the long-term growth economic growth of African countries. Further, when controlling for trade openness to exports relative to imports, we find a positive and significant long-term association between exports of goods and services economic growth in the long run, and no significant impact for imports of goods and services in the long run, or the short-run.



**Table 2. PMG long and short-run Estimates for aggregate trade openness on the growth of per capita income, 1980-2012.**

Variable	Description	Model 1	Model 2	Model 3
<b>Long-run Estimates</b>				
<i>TRADE</i>	GDP per capita (constant 2010 US\$)	0.2275 *** █ (0.0779)		
<i>TRADES</i>	Trade in services (% of GDP)		-0.0089 █ (0.0506)	
<i>TRADEM</i>	Merchandise Trade (% of GDP)		0.3631 ** █ (0.1083)	
<i>EXGS</i>	Exports of goods and services (% of GDP)			0.3367 ** █ (0.1616)
<i>IMGS</i>	Imports of goods and services (% of GDP)			-0.1202 █ (0.2024)
<i>DCREP</i>	Domestic credit to private sector (% of GDP)	0.0580 █ (0.0633)	0.0603 █ (0.0955)	0.0868 █ (0.0669)
<i>EMP</i>	Number of people engaged in employment activities	0.3448 █ (0.2882)	0.3388 █ (0.4066)	0.3365 █ (0.4278)
<i>GFCF</i>	Gross fixed capital formation (% of GDP)	0.2119 *** █ (0.0612)	0.1380 █ (0.0901)	0.1929 * █ (0.1136)
<i>HC</i>	Huma capital index	0.1716 █ (0.7945)	0.4491 █ (1.1334)	0.0823 █ (1.1454)
<b>Short-run Estimates</b>				
<i>TRADE</i>	GDP per capita (constant 2010 US\$)	-0.0117 █ (0.0151)		
<i>TRADES</i>	Trade in services (% of GDP)		0.0079 █ (0.0051)	
<i>TRADEM</i>	Merchandise Trade (% of GDP)		-0.0095 █ (0.0257)	
<i>EXGS</i>	Exports of goods and services (% of GDP)			-0.0187 █ (0.0182)
<i>IMGS</i>	Imports of goods and services (% of GDP)			0.0078 █ (0.0207)
Constant		0.3434 *** █ (0.0299)	0.2431 *** █ (0.0257)	0.3523 *** █ (0.0314)
ec		-0.3989 *** █ (0.0454)	-0.4097 *** █ (0.0446)	-0.4651 *** █ (0.0924)
N		927	927	927
CD		-1.32	-0.79	-1.33
CDP		0.1869	0.431	0.1841

Note: \*\*\*, \*\*, and \* denotes statistical significant at the 1%, 5%, and 10% levels respectively. The standard errors are presented in parenthesis. CD, CDP, and ec denote the test for weak cross-sectional dependence, its p-value, and the error correction speed of adjustment respectively. N denotes the number of observations.

Model 2 splits up openness to trade into its two main areas (services and merchandise trade openness). We find that only openness to merchandise trade has a significant long-term impact on the economic growth of African countries and no significant short-term impacts of either measure

of trade openness on economic growth. Specifically, we find that a 10 percent increase in merchandise trade as a percent of GDP, leads to 3.631% increase in the long-term growth economic growth of African countries. Further, when controlling for trade openness to exports relative to imports, we find a positive and significant long-term association between exports of goods and services economic growth in the long run, and no significant impact for imports of goods and services in the long run, or the short-run.

Similar to our findings in Table 2, the short-term error correction terms for all three models are negative, but not significant. Further, the gross fixed capital formation as a percent of GDP is positive and significant in all of the three models. In the case of the long-run impacts, we find that services export has a positive impact in the long-run after controlling for services exports and imports. It is, however, only service imports variable that has a positive significant impact on short-term economic growth. Specifically, we find that a 10 percent increase in services exports as a percentage of GDP leads to a 1.83 percent increase in the long-run economic growth. On the other hand, we find that a 10 percent increase in services imports as a percent of GDP leads to about 2.97 percent increase in the short-term economic growth.

It is possible for the imports and exports of services to have differential impacts on economic growth in the long and short-run. In order to disentangle the differential impacts of exports and imports of services and merchandise, we explicitly control for these different measures of trade openness and report the results in Table 3.

**Table 3. PMG long and short-run Estimates for exports and imports of merchandise and services trade openness on the growth of per capita income, 1980-2012**

Variable	Description	Model 4	Model 5	Model 6
<b>Long-run Estimates</b>				
<i>SERIM</i>	Total services imports (% of GDP)	-0.0106 ✓ (0.1030)		-0.1309 ** ✓ (0.0561)
<i>SEREX</i>	Total services exports (% of GDP)	0.1834 *** ✓ (0.0524)		0.1155 ** ✓ (0.0574)
<i>MIMP</i>	Total merchandise imports (% GDP)		0.2105 ** ✓ (0.0840)	0.2967 *** ✓ (0.0811)
<i>MEXP</i>	Total merchandise exports (% GDP)		0.0978 ✓ (0.0983)	0.0971 ✓ (0.0637)
<i>DCREP</i>	Domestic credit to private sector (% of GDP)	0.0412 ✓ (0.0930)	0.0339 ✓ (0.0558)	0.0287 ✓ (0.1282)
<i>EMP</i>	Number of people engaged in employment activities	0.1507 ✓ (0.2490)	-0.0333 ✓ (0.1998)	-0.3332 ✓ (0.3390)
<i>GFCF</i>	Gross fixed capital formation (% of GDP)	0.1864 *** ✓ (0.0514)	0.1502 ** ✓ (0.0658)	0.3393 *** ✓ (0.0957)
<i>HC</i>	Huma capital index	-0.0595 ✓ (0.6847)	-0.3506 ✓ (0.5581)	0.8198 ✓ (0.7013)
<b>Short-run Estimates</b>				
<i>SERIM</i>	Total services imports (% of GDP)	0.0297 *** ✓ (0.0116)		0.0124 ✓ (0.0096)
<i>SEREX</i>	Total services exports (% of GDP)	0.0001 ✓ (0.0113)		-0.0028 ✓ (0.0099)
<i>MIMP</i>	Total merchandise imports (% GDP)		0.0266 ** ✓ (0.0109)	0.0333 *** ✓ (0.0111)
<i>MEXP</i>	Total merchandise exports (% GDP)		0.0166 ✓ (0.0114)	0.0167 ✓ (0.0128)
Constant		0.4639 *** ✓ (0.0316)	0.4646 *** ✓ (0.0232)	0.4463 *** ✓ (0.0215)
ec		-0.4683 *** (0.0535)	-0.4711 *** ✓ (0.0486)	-0.4465 *** ✓ (0.0579)
N		927	927	927
CD		-1.07	-0.57	-1.24
CDP		0.1326	0.568	0.214

Note: \*\*\*, \*\*, and \* denotes statistical significant at the 1%, 5%, and 10% levels respectively. The standard errors are presented in parenthesis. CD, CDP, and ec denote the test for weak cross-sectional dependence, its p-value, and the error correction speed of adjustment respectively. N denotes the number of observations.

In model 6, we find some very interesting outcomes after controlling for exports and imports for both merchandise and services trade. For example, in the long-run, we find that services exports and merchandise imports have a positive impact on economic growth in the long-run, while

services imports negatively impact economic growth. Specifically, we find that a 10 percent increase in services exports, merchandise imports, and services imports as a percentage of GDP lead to a 1.16%, 2.97% increase and -1.31% decrease in per capita income, respectively. In the case of short-term impacts, we find that only manufacturing imports have a significant positive impact on short-term economic growth. Specifically, we find that a 10 percent increase in merchandise imports as a percent of GDP leads to a 0.33% increase short-term economic growth.

Table 4 presents our PMG estimation results for the case where we only consider services trade in a disaggregated form. We find that commercial services exports have a significant positive significant impact on economic growth in the long-run, but positive insignificant impact on growth in the short-run (Model 7). Specifically, we find that a 10 percent increase in commercial services exports leads to 1.65% and 0.254% increase in economic growth in the long and short-run, respectively. When we control for both exports and imports of other services, we find that an increase in the exports of other services has a positive and significant effect on in the long-run but a negative insignificant effect on growth in the short-run. More specifically, we find that a 10 percent increase in the export services as a percent of GDP leads to a 1.36 percent increase in growth in the long-run, but a negative and insignificant impact on growth in the short-run (Model 8). Combining commercial and other services trade as a percent of GDP (Model 9), we find that increases in commercial services exports are positively associated with growth in the long-run, but positively and insignificantly related with commercial service imports in the short-run. Specifically, a 10 percent increase in commercial services exports leads to a 2.91% and 0.32% increase in growth in the long-run and short-run, respectively.

**Table 4. PMG long and short-run estimates for disaggregated exports and imports of services trade openness on the growth of per capita income, 1980-2012.**

Variable	Description	Model 7	Model 8	Model 9
<b>Long-run Estimates</b>				
<i>CSEREX</i>	Commercial services (Services excl. government services) exports (% of GDP)	0.1649 ** ▾ (0.0702)		0.2911 ** ▾ (0.1289)
<i>CSERIM</i>	Commercial services (Services excl. government services) imports (% of GDP)	-0.0124 ▾ (0.1759)		-0.0378 ▾ (0.0920)
<i>OSEREX</i>	Other services exports (% of GDP)		0.1358 *** ▾ (0.0461)	-0.0120 ▾ (0.1802)
<i>OSERIM</i>	Other services imports (% of GDP)		-0.0140 ▾ (0.0527)	-0.1045 ▾ (0.0910)
<i>DCREP</i>	Domestic credit to private sector (% of GDP)	0.0472 ▾ (0.4168)	0.0436 ▾ (0.0689)	0.0093 ▾ (0.0910)
<i>EMP</i>	Number of people engaged in employment activities	0.2352 ▾ (0.8642)	0.2366 ▾ (0.5526)	0.4357 ▾ (0.7748)
<i>GFCF</i>	Gross fixed capital formation (% of GDP)	0.1994 ▾ (0.1137) *	0.2446 * ▾ (0.1407)	0.2953 ▾ (0.1989)
<i>HC</i>	Huma capital index	-0.1844 ▾ (1.2230)	0.1077 ▾ (1.5310)	-0.5558 ▾ (2.1137)
<b>Short-run Estimates</b>				
<i>CSEREX</i>	Commercial services (Services excl. government services) exports (% of GDP)	0.0053 ▾ (0.0113)		0.0090 ▾ (0.0127)
<i>CSERIM</i>	Commercial services (Services excl. government services) imports (% of GDP)	0.0254 ** ▾ (0.0121)		0.0322 ** ▾ (0.0158)
<i>OSEREX</i>	Other services exports (% of GDP)		-0.0014 ▾ (0.0043)	-0.0073 ▾ (0.0064)
<i>OSERIM</i>	Other services imports (% of GDP)		0.0160 *** ▾ (0.0055)	0.0040 ▾ (0.0099)
Constant		0.4516 *** ▾ (0.315)	0.3890 *** ▾ (0.0327)	0.4000 *** ▾ (0.0365)
ec		-0.4475 *** ▾ (0.0571)	-0.5678 *** ▾ (0.0934)	-0.4636 *** ▾ (0.0836)
N		927	927	927
CD		-1.17	-1.18	-1.04
CDP		0.1729	0.1889	0.1047

Note: \*\*\*, \*\*, and \* denotes statistical significant at the 1%, 5%, and 10% levels respectively. The standard errors are presented in parenthesis. CD, CDP, and ec denote the test for weak cross-sectional dependence, its p-value, and the error correction speed of adjustment respectively. N denotes the number of observations.

Openness to trade can impact growth directly, or indirectly through learning and dissemination of technology from advanced economies (Rivera-Batiz & Romer, 1991; Barro & Sala-i-Martin, 1997;

Zahonogo, 2016)). This is not to say that trade will always have positive impacts. Whereas the learning effect is expected to be almost always positive, or at worst to have an insignificant impact on growth, the direct impact of trade on growth may be positive, insignificant, or negative. The direct impact of trade openness can be negative if imports lead to domestic and international trade destruction and also in the case of negative balance of payments which cause the other sectors of the economy being starved of needed financial investments. Openness to trade can also directly impact trade through increased in exports and economic diversification. However, it is possible, that a country that is open to trade will be either importing more than they export, or their exports may be of the type with limited multiplier effects, or even associated with resource curse (raw materials), thus leading to a negative or insignificant relationship with growth. We can, thus, conclude that the ultimate impact of openness to trade is dependent on which catalyst is the strongest.

## **4.2 Discussion of Results**

The finding that openness to trade is positively associated with economic growth is not a novel revelation. When we disaggregate the broad measure of openness trade into imports of foreign merchandise and the exports of merchandise of goods and services, it is interesting to find that the imports of foreign merchandise are the main drivers behind the significant positive impact on the economic growth of African countries, both in long and short-run. The positive association of merchandise imports to growth may be due to imports serving as inputs for further production, or through learning new technologies which possibly impact the efficiency of other sectors to spur economic growth. On the hand, while exports of merchandise of goods and services have a positive association with economic growth, their impact on growth is insignificant, both in the short and

long-run. This may be due to the type of merchandise exported by African countries. It is well documented that a significant portion of merchandise exports from most African countries typically comprise of unprocessed natural resources like gold diamonds, oil, coffee, and cocoa beans which only have small multiplier effects. According to a recent study by UNCTAD (2018), not only does Africa lag behind other developing regions on global exports performance and its share in global exports, but SSA also exhibits a high degree of dependence on a few primary agricultural, or mineral exports and experiencing one of the worst rate of unemployment in the world. The high volatility of the prices of these products coupled with the “natural resources curse” may be contributing factors for the insignificance of merchandise exports both in the short and long-run. This may be a clarion call for policymakers to find ways and means of diversifying the types of merchandise exports emanating from their domestic economies.

It is theoretically plausible to expect services imports have a positive indirect impact on economic growth through their international technological diffusion. In our analysis, however, we only find the positive short-run impact of services imports, but a significantly negative long-run impact on growth. This may be indicative of two possible impacts of trade in services (positive and negative). This may possibly be due to the fact that the benefits of “learning by doing” occur in the short term through importing services with technologies that impact productivity in the short-run. In the long-run, however, the benefits of learning wains over time, implying the importance of showing your competitiveness in the global marketplace. Nevertheless, the negatives of importing tend to outweigh the benefits of learning via imports. This finding may also be due to that fact that the benefits of services imports are short-lived because the technologies associated with such imports are fast changing and as such exhibiting only short-term benefits.

## **5. Summary, Conclusions, and Policy Implications**

The objective of this paper is to examine the impact of trade openness on the economic growth of African countries both in the short and long-run. By primarily using the broad measures of openness to trade, namely, trade as a percent of GDP, previous empirical studies have found mixed results (positive and negative impact of openness to trade on growth). We use panel data for a cross-section 28 African countries over the 1980-2016 period and the pooled mean group (PMG) option which allows for dynamic common correlated effects for the estimation of both homo and heterogeneous coefficients. Our preliminary results suggest that: (1) the broad measure of openness to trade has a positive and significant effect on growth in the long-run, but a negative and insignificant effect on growth in the short-run (Model 1); (2) Merchandise trade has a positive and significant effect on growth in the long-run, but a negative and insignificant effect on growth in the short-run (Model 2); (3) Exports of goods and services have a positive and significant effect on growth in the long-run, but negative and insignificant effect in the short-run (Model 3); (4) total services imports have a negative, but insignificant effect on growth in the long-run, but positive and significant effect on growth in the short-run; (5) total merchandise imports have a positive and significant effect on growth both in the long and short-run (Model 5); (6) total merchandise imports have a positive and significant effect on growth both in the long and short-run (Model 6); (7) commercial services have a positive and significant effect on growth in the long-run, but insignificant effect on growth in the short-run (Model 7); (8) other services exports have a positive and significant effect on growth in the long-run, but negative and insignificant effect on growth (Model 8); and finally (9) total commercial services have a positive and significant on growth in the long-run, but positive and insignificant effect of growth in the short-run (Model 9).



In terms of the implications of the study, we state that policy makers in Africa may promote their economic growth by reducing their specialization and overreliance on the export of few primary goods through the diversification of the production of goods and services for domestic consumption as well exports. Policymakers may implement trade policies that attract sectoral trade and investment options that are value creating and do not lead to the underutilization of domestic human and physical capital and natural resources, or lead to a concentration of resources in extractive industries, and/or adopt technologically advanced industries with increasing returns. Since we find that differences in the short and long-term impacts of various components of openness, we also caution policymakers to be mindful of the differential impacts of trade policies for harnessing the direct, or indirect impact of trade openness.

Note:

1. <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS>

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## Appendix

Table A1. Country List

Algeria	Madagascar
Benin	Malawi
Botswana	Mali
Burkina Faso	Mauritius
Cameroon	Morocco
Cote d'Ivoire	Niger
The Democratic Republic of the Congo	Nigeria
Eswatini	Senegal
Egypt, Arab Rep.	Sierra Leone
Gabon	South Africa
The Gambia	Sudan
Ghana	Togo
Kenya	Tunisia