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Research Article

The Impact of Regional Integration on Africa's Manufacturing Exports

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ABSTRACT

This paper analyses the impact of Regional Trade Agreements (RTAs) on intraregional manufactured exports in Africa. Using data from 1990 to 2015 for 45 African countries, a structural gravity model was estimated using the Poisson pseudo maximum likelihood estimator that controlled for heteroscedasticity and allowed for bilateral zero trade values between trading partners. The study also accounted for multilateral resistance effects, endogeneity of RTAs, and the phased-in impacts of RTAs. On average, a regional trade agreement led to a 72% increase in manufacturing exports between members within 12 years of the ratification of the trade agreement.

1. INTRODUCTION

Do African Regional Trade Agreements (RTAs) increase intraregional manufacturing trade? The 1994 Abuja Treaty led to the creation of several African RTAs that include the Common Market for Eastern and Southern Africa (COMESA), Economic Community of West African States (ECOWAS), East African Community (EAC), Southern African Development Community (SADC), Central African Economic and Monetary Community, the Southern African Customs Union, and the Tripartite Free Trade Area. A primary objective of all the African RTAs has been to boost manufacturing exports. This is because manufacturing is essential for diversified production and increased productivity in Africa. These RTAs encouraged African countries to promote markets for manufactured goods within the African continent. Likewise, one of the primary objectives of the African Continental Free Trade Area (that was launched in March 2018 in Kigali) is to increase manufacturing exports. The African Continental Free trade area is expected to lift intra-African industrial exports by 53% (Mevel and Karingi, 2013). The Tripartite Free Trade Area is expected to raise intraregional trade in heavy manufacturing, light manufacturing, processed foods, and textiles, by 25%, 49%, 55%, and 78%, respectively (Mold and Mukwaya, 2016).

Why is manufacturing critical for Africa's growth? Several authors have argued that the composition of exports matters for growth and those countries that export a higher share of manufactured products grow faster than countries that export a low share of manufactured products. Fosu (1990) analyzed the different impacts of primary and manufacturing exports on economic growth in less-developed countries and found that the manufacturing exports had a positive and significant effect on economic growth. By contrast, primary exports did not have a significant effect on Gross Domestic Product (GDP) growth in less-developed countries. Sachs and Warner (1995) showed that economies with a high ratio of natural resource exports to GDP tended to have low growth rates. Hausman et al. (2007) argued that the type of products in which a country specialized had important implications for subsequent economic performance. They showed that countries that exported goods associated with higher productivity levels, such as manufacturing, grew more rapidly than countries specializing in primary exports.

Although regional integration in Africa has progressed since 1990 with more countries signed up as members of RTAs (Table 1), Africa's manufacturing performance in the same period has been relatively weak. Africa's average share of manufacturing in gross value added declined from 12.8% of GDP in 1990 to 9.8% in 2014 (UNECA, 2017). Similarly, the share of manufacturing exports in Africa's total exports declined, from 25.6% in 1995 to 18.9% in 2014. The inability of manufacturing exports to grow in spite of regional integration agreements suggests the need to evaluate the effects of regional integration agreements on manufacturing exports.

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Table 1 | African regional trade agreements

Regional trade agreement	Free trade area	Customs union	Single market	Economic and monetary union	Countries
East African Community – 2000	✓	✓	✓	×	Burundi , Kenya, Rwanda, Tanzania, Uganda
Common Market for Eastern and Southern Africa – 1994	✓	×	×	×	Burundi, Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Sudan, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
Economic Community of West African States – 1993	✓	✓	×	×	Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo
Southern African Development Community – 1992	✓	×	×	×	Angola, Botswana, Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
Southern African Customs Union – 2002	✓	✓	×		Botswana, Lesotho, Namibia, South Africa, Swaziland
Economic and Monetary The Community of Central Africa – 1999	✓	×	×	✓	Gabon, Cameroon, Central African Republic, Chad, Republic of the Congo, Equatorial Guinea

Source: UNECA (2017).
Note: This table lists all the regional trade agreements used in the estimation.

Several studies have attempted to estimate the ex-post effects of African RTAs on manufacturing exports (see Bongsha et al., 2014; Iwanow and Kirkpatrick, 2009; Sichei et al., 2008). These studies have estimated the log-linear form of the gravity model. The recent empirical literature on the gravity model (see Silva and Tenreyro, 2006; Anderson and Yotov, 2016; Piermartini and Yotov, 2016) has shown, however, that the gravity equation should not be estimated with the log-linear specification [Ordinary Least Square (OLS) estimators], because the precision of the estimates would be compromised by heteroscedasticity. Additionally, Baier and Bergstrand (2007) and Halvorsen and Palmquist (1980) argued that trade policy variables were biased estimators due to endogeneity. The studies on the effects of African RTAs on manufacturing that have failed to account for endogeneity and heteroscedasticity may have therefore produced unreliable estimates. Additionally, these other studies on the ex-post effects of African RTAs on manufacturing exports have included relatively small numbers of African countries and less up-to-date data have been used.

In contrast to the previous studies on the effect of RTAs on manufacturing in Africa, more up-to-date data from 1990 to 2015 were used, and the gravity model was estimated using the Poisson Pseudo Maximum Likelihood (PPML) estimator, which controlled for heteroscedasticity. The paper further controlled for multilateral resistance effects that capture the degree of isolation from the rest of the world, to the extent that the more isolated a region is from the rest of the world, the higher the degree of trade among the regional member countries (Piermartini and Yotov, 2016). Finally, the paper controlled for endogeneity using bilateral pair fixed effects, as trade policy variables are endogenous (Baier and Bergstrand, 2007). The results show that, on average, an African RTA led to a 72% increase in manufacturing exports between members within 12 years from their formation.

The paper is organized as follows: Section 2 discusses the empirical approach and previous studies that have used the gravity model to study regional integration in Africa. Section 3 discusses the empirical estimation of the gravity equation and datasets. Section 4 presents the regression results and Section 5 presents the conclusion.

2. LITERATURE REVIEW

Following the seminal work of Tinbergen (1962), the gravity equation has been the primary empirical model used to analyze the (ex-post) effects of RTAs. The theoretical framework of the gravity model was first provided by the work of Anderson (1979), Krugman (1979, 1980), Helpman (1981), Bergstrand (1985), Bergstrand (1989) and Deardorff (1998). These early applications were partial-equilibrium, reduced-form specifications of the gravity model. Anderson and van Wincoop (2003) incorporated general equilibrium features for trade and developed a structural gravity model that included multilateral resistance effects.

While the theoretical framework of the gravity model has been robust, there have been challenges with the empirical estimation. Issues with missing multilateral resistance effects, selection bias (in the presence of zero bilateral trade), heteroscedasticity, and endogeneity may have led to biased and/or inefficient estimators of the gravity model (Piermartini and Yotov, 2016).

Regarding the missing multilateral resistance effects, Anderson and van Wincoop (2003) argued that regions that were more isolated from the rest of the world would trade more with each other (multilateral resistance). The failure to account for these multilateral resistance effects would lead to biased estimates. Olivero and Yotov (2012) showed that the multilateral resistance effects should be accounted for by exporter- and importer-time fixed effects.

Concerning selection bias, Helpman et al. (2005) explained that in the presence of zero trade values (zeros occur because some pairs of countries did not trade in a given period, especially the case for small countries and disaggregated data), the use of the log-linear form of the gravity equation would lead to biased estimates. This is because the pairs of countries with zero trade would be dropped from the data in order to estimate the log-linear model (OLS estimator). The selection effect would involve a positive correlation between the unobserved error term and the trade barriers and would likely lead to an upward selection bias. Helpman et al. (2005) corrected for selection bias using two-stage estimation that used a fixed-cost equation for selection into trade partners in the first stage and a standard gravity equation in the second stage.

Relating to heteroscedasticity, Silva and Tenreyro (2006) argued that the gravity equation and, more generally, constant-elasticity models, should not be estimated with the log-linear specification (OLS or Tobit estimators). They estimated the gravity model using OLS, Tobit (log-linear form), and the PPML estimator (multiplicative form) and demonstrated that the estimates from the OLS and Tobit were biased due to heteroscedasticity. In contrast, the PPML estimator produced consistent estimators in the presence of zero trade values, because the zero observations did not matter for the estimation of gravity equations in their multiplicative form (Silva and Tenreyro, 2006).

With respect to endogeneity, Baier and Bergstrand (2007) argued that trade policy variables were not exogenous because they were correlated with unobservable cross-sectional trade costs. Standard instrumental variable techniques could be used to correct for endogeneity but finding the correct instruments was a challenge. The authors, therefore, controlled for endogeneity using bilateral-pair fixed effects. However, the pair-fixed effects absorb all the time-invariant variables, which can be a challenge because the model cannot identify the impact of any time-invariant determinants of trade flows.

The empirical literature of African RTAs shows that the effects of RTAs have been mixed. The variation in estimates of RTAs has been partly due to differences in the choice of empirical models. Some authors have attempted to control for zero trade values by using Tobit and Heckman selection models. Rojid (2006) used a panel data analysis to estimate the effect of COMESA on export flows between 1980 and 2001. The study used a Tobit model to control for zero trade values and found that COMESA had created more trade within the region. However, this study does not control for heteroscedasticity and endogeneity in the RTAs. Iwanow and Kirkpatrick (2009) used a panel dataset for 124 developed and developing countries for the period 2003–2004 to measure the impact of trade facilitation on manufacturing export from Africa. They used a Heckman selection model to control for selection bias and found a positive and significant effect of RTAs on trade. However, these studies did not control for heteroscedasticity or endogeneity in the RTAs.

Other studies on African RTAs have used the PPML estimators to control for hetroscedasticity associated with log-linear gravity model. Korinek and Melatos (2009) analyzed the trade effects of three RTAs—the Association of Southeast Asian Nations (ASEAN) Free Trade Agreement, COMESA, and the Southern Cone Common Market—in the agricultural sector using data for the period 1981–2006. They corrected for heteroscedasticity using a PPML estimator and found a negative effect of COMESA (–0.16) on agricultural exports. However, the study did not correct for the endogeneity of the RTAs. Likewise, Luqman et al. (2015) investigated the effect of ECOWAS on bilateral trade flows from 1981 to 2013. They used a PPML estimator and found that the ECOWAS dummy variable was negative. However, the study did not account for endogeneity and multilateral resistance terms. Buigut (2016) assessed the average trade effect of the EAC Customs Union implemented in 2005. The study covered the period 2000–2013 with a total of 49 trading partners. This study used a PPML estimator, correcting for both endogeneity and multilateral resistance terms. The study found that the EAC Customs Union had produced a moderate positive effect on intra-EAC trade of about 22.1%.

Turkson (2012) studied the ex-post bilateral trade effect of the European Union-African Caribbean Pacific Preferential Trade Agreement (EU-ACP PTA) and subregional RTAs on bilateral trade involving sub-Saharan African countries. The author examined trade flows for the period 1960–2006, controlled for the endogeneity of the trade agreement dummy, and accounted for multilateral price resistance. The study used a negative binomial pseudomaximum likelihood estimator and found a positive and significant effect of EU-ACP PTA, ECOWAS, and SADC on bilateral trade. However, Bosquet and Boulhol (2014) argue that while the negative binomial PML estimator controls for heteroscedasticity and accounts for zero trade values, it is not invariant to the scale of the dependent variable. For example, measuring trade in millions or thousands of dollars will lead to different estimates of the elasticity.

Afesorgbor (2013) conducted a meta-analysis of previous empirical studies that used the log-linear form of the gravity model. The simple metaregressions indicated that African regional blocs had a positive effect of about 27–32% on bilateral trade. By contrast, when his study used a PPML estimator on trade flows from 1980 to 2006 for 47 African countries, he found larger positive and significant effects for COMESA (48%), SADC (92%), and ECOWAS (200%).

The literature shows that some of the most recent studies on the effect of African RTAs on aggregate trade flows have accounted for multilateral resistance effects, zero bilateral trade, heteroscedasticity, and endogeneity to produce consistent, unbiased estimates. However, the studies on the impact of the African RTAs on disaggregated trade flows (manufacturing and agriculture) have not been revised to account for endogeneity in the RTAs, and this could lead to inconsistent estimators. In this paper, I explore the average impact of African RTAs on African manufactured exports using data from 1990 to 2015 and a PPML estimator, while also accounting for both multilateral resistance effects and endogeneity.

3. EMPIRICAL IMPLEMENTATION AND ANALYSIS

3.1. Econometric Specification

Following Anderson and Yotov (2016), I estimate the following structural gravity model (Equation (1)):

$$X_{ijt} = \exp(\beta_1 \mathrm{RTA}_{ijt} + \beta_2 \ln \mathrm{DIST}_{ij} + \beta_3 \mathrm{BRDR}_{ij} + \beta_4 \mathrm{LANG}_{ij} + \beta_5 \mathrm{CLNY}_{ij} + \mathrm{EX}_{it} + M_{it}) + e_{ijt} \tag{1}$$

where, i, j, and t represent country i, country j, and time, respectively. X_{ijt} are manufacturing exports from 45 African countries to the rest of the world between 1990 and 2015, RTA_{ijt} is an indicator variable for a regional trade agreement between two African countries i and j at time t. RTA_{ijt} is equal to 1 if there is an RTA between African countries i and j at time t, and it is equal to 0 otherwise. $\ln\mathrm{DIST}_{ij}$ is the logarithm of bilateral distance. BRDR_{ij}, LANG_{ij}, and CLNY_{ij} capture the presence of contiguous borders, common language, and colonial ties, respectively. EX_{it} are exporter time fixed effects, which control for the outward multilateral resistances, while M_{it} are importer time fixed effects that capture the inward multilateral resistances. Following Baier and Bergstrand (2007) and Anderson and Yotov (2016), the value of the RTA effect (β_1) is specified as uniform across African countries (as opposed to calculating the impact of each African RTA). Anderson and Yotov (2016) argue that, because of the extensive fixed-effects structure of the econometric specification of the model used in this paper and the small variability in any individual RTA indicators, we cannot identify the effects of specific RTAs separately.

Anderson and van Wincoop (2003) argued that all else equal, regions that are more isolated from the rest of the world would trade more with each other (multilateral resistances). Exporter-time fixed effects (EX_{it}) and importer-time fixed effects (M_{it}) which control for multilateral resistances are included in Equation (1). These exporter and importer fixed effects absorb both the exporter and importer GDP values. Following Silva and Tenreyro (2006), Equation (1) was estimated using both the OLS and the PPML estimators for comparative purposes.

Baier and Bergstrand (2007) show that trade policy variables are not exogenous, because they may be correlated with unobservable cross-sectional trade costs, and that estimates of RTAs are biased in the presence of endogeneity. In Equation (2), country-pair fixed effects U_{ij} are included; they control for endogeneity, and absorb all time-invariant gravity covariates ($\ln\mathrm{DIST}_{ij}$, BRDR_{ij}, LANG_{ij}, and CLNY_{ij}). The model is estimated with the PPML estimator.

$$X_{ijt} = \exp(\beta_1 \mathrm{RTA}_{ijt} + \mathrm{EX}_{it} + M_{it} + U_{ij}) + e_{ijt} \tag{2}$$

Two countries are more likely to liberalize trade between themselves if they are already significant trade partners, implying that there is possible reverse causality between trade and RTA. To test whether the model with pair fixed effects has corrected for potential reverse causality between trade and RTAs, we follow Baier and Bergstrand (2007) and Piermartini and Yotov (2016), and include a lead variable of RTAs, $\mathrm{RTA}_{ijt} + 4$, to the model and estimate Equation (3). If the lead variable is statistically significant, then there is reverse causality between RTAs and trade, and trade is causing the RTAs.

$$X_{ijt} = \exp(\beta_1 \mathrm{RTA}_{ijt} + \beta_6 \mathrm{RTA}_{ijt+4} + \mathrm{EX}_{it} + M_{it} + U_{ij}) + e_{ijt} \tag{3}$$

Following Baier and Bergstrand (2007), Anderson and Yotov (2016) and Piermartini and Yotov (2016) lagged effects of RTA on trade are included in the model in Equation (4). The lagged effects are essential because while the indicator variable RTA_{ijt} captures the commencement date of the trade agreement, RTAs are typically implemented gradually with some provisions of the agreements being phased-in at a later date. It is therefore essential to account for the phased-in effect.

$$X_{ijt} = \exp(\beta_1 \mathrm{RTA}_{ijt} + \beta_7 \mathrm{RTA}_{ijt-4} + \beta_8 \mathrm{RTA}_{ijt-8} + \beta_9 \mathrm{RTA}_{ijt-12} + \mathrm{EX}_{it} + M_{it} + U_{ij}) + e_{ijt} \tag{4}$$

3.2. Data Description

This study covers the period 1990–2015 and manufacturing exports from 45 African countries to both Africa and the rest of the world. The data on African manufacturing exports were obtained from the UN Comtrade via World Integrated Trade Solution. Manufacturing exports were classified according to the Standard International Trade Classification Revision 2. Data on bilateral distances, colonial ties, common language, contiguous borders, and RTAs for the period 1990–2015 were obtained from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) website. Data on the RTAs were constructed by Baier and Bergstrand (2007) and de Sousa (2012).

4. RESULTS

The panel regression results are reported in Table 3 and the descriptive statistics in Table 2. The equation in Column 1 in Table 3 includes all standard gravity variables including the logarithm of bilateral distance, and the dummy variables for common borders, common official language, colonial ties, and a dummy variable RTA that accounted for African RTAs between the countries in the sample data. As a baseline estimation, the equation in Column 1 in Table 3 was estimated, using the OLS estimator with time-varying importer and exporter fixed effects that controlled for multilateral resistance terms. The coefficient on distance was significant and negative as expected. The other covariates: the common border, language, and colony dummies were all positive and significant as expected. The estimates of the fixed effects were omitted for brevity. The estimated coefficient of the variable RTA reported in Column 1 in Table 3 suggests that the formation of African RTAs led to an average increase of 154% in intraregional manufacturing exports.[1] However, this OLS (log-linear) model might be inefficient or biased due to heteroscedasticity and endogeneity.

[1]Coefficient of the RTA is interpreted as $\{[\exp(\beta_1) - 1] \times 100\}$ in percentage terms.

Table 2 | Descriptive statistics

Variable	Obs	Mean	Standard deviation	Minimum	Maximum
Manufacturing exports (USD)	62,769	21,600,000	157,000,000	0	5,130,000,000
Log manufacturing exports (USD)	60,057	12.1	3.5	0	22.36
Log distance (km)	62,769	8.5	0.8	5.1	9.89
Common border	62,769	0.0	0.2	0	1
Common language	62,769	0.3	0.5	0	1
Colony	62,769	0.0	0.1	0	1
Regional trade agreement	62,769	0.1	0.3	0	1

Source: Author's calculations. Obs, Observations.

Table 3 | Effects of African RTAs on manufacturing exports

	1	2	3	4	5
	OLS (FE)	**PPML (FE)**	**PPML (Endogeneity)**	**PPML (Lead RTA)**	**PPML (Lag RTA)**
Dependent variable	$\ln(X_{ij})$	X_{ij}	X_{ij}	X_{ij}	X_{ij}
Log distance	-1.674^{***} (0.065)	-1.172^{***} (0.146)			
Common border	1.694^{***} (0.156)	0.699^{***} (0.258)			
Common language	0.873^{***} (0.072)	0.442^{***} (0.148)			
Colony	1.426^{***} (0.313)	1.431^{***} (0.398)			
RTA	0.933^{***} (0.118)	1.148^{***} (0.206)	0.31^{**} (0.16)	0.333^{**} (0.162)	0.377^{**} (0.165)
RTA_lag4					−0.075 (0.124)
RTA_lag8					−0.08 (0.066)
RTA_lag12					0.167^{*} (0.091)
RTA_lead4				−0.132 (0.096)	
Constant	18.7^{***} (0.76)				
Total RTA Effect					0.54^{***} (0.205)
Pair FE	No	No	Yes	Yes	Yes
Exporter-year FE	Yes	Yes	Yes	Yes	Yes
Importer-year FE	Yes	Yes	Yes	Yes	Yes
Number of observations	60,057	62,760	62,411	62,407	62,399
R^2	0.63	0.824	0.967	0.967	0.968

$^{*}p < 0.10$. $^{**}p < 0.05$. $^{***}p < 0.01$. FE, fixed effect; OLS, ordinary least squares; PPML, Poisson pseudo maximum likelihood; RTA, regional trade agreement.

Source: Authors' calculations.

Note: All estimates were obtained using exporter- and importer-time FEs. The estimates of the FEs are omitted for brevity. Column 1 applies the OLS estimator and Column 2 uses the PPML estimator but does not control for endogeneity. Column 3 uses the PPML estimator and adds paired FEs to control for endogeneity. The estimates of the paired FEs are omitted for brevity. Column 4 introduces RTA lead effects which test for reverse causality. Column 5 allows for lagged effects of RTAs. Standard errors are clustered by country pair and are reported in parentheses.

In Column 2 in Table 3, the multiplicative form of the gravity model was estimated using the PPML estimator, which controlled for heteroscedasticity and allowed for the presence of zero trade flows in the data. Importer and exporter fixed effects were included to control for multilateral resistance. The results show that all the coefficients are significant with the expected signs. However, there are changes in the magnitudes of the coefficients relative to the Column 1 in Table 3 model. The coefficients on common borders (0.7) and common official language (0.4) are smaller than those in the Column 1 in Table 3, but closer to the value of 0.5 for both common border and common language coefficients found by Head and Mayer (2014) in a meta-analysis of gravity studies. The estimated elasticity on distance (−1.2) is closer to the average elasticity (−1.0) found in the literature by Head and Mayer (2014), compared with the elasticity of 1.7 from the OLS model. With respect to the RTA effect, the results show that the formation of RTAs led to an average increase of 215% of intraregional manufacturing exports. However, this model does not control for endogeneity of the RTAs.

The equation in Column 3 in Table 3 was estimated with the PPML estimator, importer and exporter fixed effects, and pair fixed effects in order to control for endogeneity. The equation contains fewer variables because the pair-fixed effects absorbed all bilateral time-invariant variables, for example, distance, language, and colony. The estimates of the fixed effects were omitted for brevity. The results show that the formation of African RTAs led to an average increase of $\{[\exp(0.31) - 1] \times 100\}$ 36% of intraregional manufacturing exports.

In Column 4 in Table 3 following Baier and Bergstrand (2007), this study tested for reverse causality between trade flows and RTAs. Two countries were more likely to liberalize trade between themselves if they were already significant trade partners. A lead variable (a 4-year lead) RTA_lead4 that measured the future level of the trade agreement was added to the model. If RTA_lead4 was statistically significant, then there was reverse causality between RTAs and trade, and trade was causing the RTAs. The results show that RTA_lead4 is not significant, suggesting that there was no reverse causality between RTAs and trade.

In Column 5 in Table 3 following Piermartini and Yotov (2016), lagged RTA variables (the RTA variable was lagged over 4-, 8-, and 12-year periods) were included to control for the phased-in impacts of trade policy. Most RTAs are implemented gradually over a period, with some provisions of the trade agreements being executed over more extended periods, so it may not be possible to capture the full impact of the RTA in the year when the agreement comes into force Anderson and Yotov (2016). The lagged RTA variables account for the possibility that the change in two countries' terms of trade from the formation of an RTA may have a lagged impact on their bilateral trade. The results show that the coefficient on the RTA_lag12 (RTA lagged over 12 years) variable is positive and significant, suggesting that it took an average of 12 years for the full economic effect of the African RTA to materialize. The variable Total RTA Effect reflects the total RTA effects obtained by summing the values of individual (significant) RTA coefficients in Column 5 in Table 3.[2] The variable Total RTA Effect was positive and significant, which implied that after 12 years African RTAs led to an average increase of {[exp (0.54) − 1] × 100} 72% in intraregional manufacturing exports. This value was lower than that of Baier and Bergstrand (2007), who found that, on average, a trade agreement resulted in a 100% increase in bilateral trade between members within 10 years from the commencement of the agreement. However, the 72% effect of African RTAs on manufacturing exports is higher than the average EU effect (17%) on intraregional trade found by Head and Mayer (2014).

5. CONCLUSION

This paper analyzed the impact of African RTAs on manufactured exports using data from 1990 to 2015. The results showed that on average, an African RTA led to a 72% increase in intraregional manufacturing exports within 12 years of the ratification of the agreement.

Thus, regional integration in Africa had a substantial positive effect on intraregional manufacturing exports between 1990 and 2015. However, the 72% increase was based on a low base of manufacturing trade among African countries and, in addition, manufacturing exports may constitute a small portion of Africa's overall manufacturing. Furthermore, as discussed earlier, the growth of African manufacturing exports over the same period (1990–2015) has been relatively weak. Therefore, on its own, regional integration might not be enough to accelerate manufacturing exports or overall manufacturing in Africa.

What does this mean for the regional integration (specifically the African continental free trade area) and the future of manufacturing in Africa? In 1994 when the Abuja treaty was signed, most African countries had abandoned industrial policies in favor of structural adjustment policies. By contrast, by the time the African continental free trade area was signed in March 2018, industrial policy was back on the African development agenda. Indeed, it is the combination of regional integration and industrial policy that will likely provide stronger momentum for manufacturing.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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