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Gains and Losses in a Trade Bloc: The Case of the East African Community

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From birth to death in the 1970s, to rebirth in the 2000s, the East African Community (EAC) had several lives. What were the economic consequences of this regional trade agreement? This paper shows that the former EAC was inefficient in term of trade creation while on the contrary the current one has increased trade by 75%. These results are obtained with a structural gravity equation with importer-year, exporter-year effects and bilateral fixed effects. To assess the global effect of the EAC, including trade diversion and general equilibrium effects, we then use a multi-sector and multi-country model. We find that despite trade creation, the total welfare gains of the EAC is small for most countries. All members endured a depreciation of the terms of trade, trade diversion and a decrease in real wages at the exception of Kenya.
JEL: F1, F13, F15
Keywords: Trade integration, Gravity, RTA

I. Introduction

For more than forty years, African countries have enforced many different Regional Trade Agreements (RTAs) but empirical analysis of the effects of these agreements on trade and welfare are still scarce. The current paper analyzes the East African Community (EAC). Founded in 1967 by the three countries of Kenya, Tanzania and Uganda, the first EAC collapsed in 1977 on the grounds that Kenya was taking the lion's share of the benefits of the EAC. The new EAC enforced in 2000 by Kenya, Tanzania and Uganda and then by Rwanda and Burundi in 2007, which became a fully-fledged Customs Union in 2009, adopts a more optimistic point of view by considering this regional integration as mutually beneficial. To our knowledge these successively negative and positive opinions have never been analyzed until now, at least not in the way we proceed.

Using fifty years of trade data over the period 1964-2014, we undertake a within identification strategy with dummies of the EAC that varies over time enabling us to control for the various variables explaining trade by using importer-year, exporter-year and country pair fixed effects. We find that the former EAC (1967-

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1977) has not been significant to foster trade while the recent EAC has strongly increased bilateral exports over the period 2000-2012. Beyond this statistical analysis, we use a multi-country and multi-sector Ricardian model to quantify and to decompose the gains/losses of the current EAC between countries and across sectors. The model is based on Caliendo and Parro (2015) and takes into account the international trade of intermediate goods and the impact of input-output linkages on trade. It is a well known fact that countries exchange intermediate goods along the global supply chain, however since African countries are highly specialized and often viewed as marginalized to the world trade network, counterfactual analysis with such a model has never been done for RTAs in Africa. Still, at the beginning of the EAC in 2000, trade in intermediate goods represented half of the total importation of the members of this agreement.[1] Then, it seems crucial to take into account these data to assess the impact of the EAC.

Regarding the literature on gravity equations, only a handful of studies has been undertaken with the aim to better control for bilateral and individual-time unobserved characteristics in Africa. Carrère (2004) provides convincing evidence of the positive effect of RTAs on African trade using a panel specification with random bilateral effects. Candau, Guepie and Schlick (2019) use bilateral fixed effects, and country-year effects to control for institutional and cultural determinants of trade that vary over the period analyzed. They also analyse the contents of African RTAs and find contrasted results. The effect of RTAs on African trade is positive, but depending on the depth of the RTAs, there is a decreasing impact over time. While Economic Integration Agreements (EIAs) still favour trade in Africa, there was no trade creation coming from Free Trade Agreements between 1990 and 2014. Finally the current analysis is in the vein of Mayer and Thoenig (2016) who analyze how trade has pacified Eastern Africa.

Regarding the counterfactual analysis, many Computable General Equilibrium models (CGE) have been used to analyzed the EAC (Willenbockel, 2012; Balistreri et al., 2016), and have concluded that this agreement has successfully promoted growth and reduced poverty in the trade bloc. Mayer and Thoenig (2016) use a middle size model without intermediate trade (Arkolakis et al. 2012) to study RTAs and find that these agreements has been beneficial to promote trade. Here, using a richer model than the Arkolakis et al. (2012) model, but however more transparent than classical CGE, our conclusion is less positive. We find strong trade diversion in many countries (in particular in Rwanda) and a deterioration of the term of trade in all members (with the exception of Kenya). Considering the overall impact, including trade creation, we find that the EAC has been beneficial but gains remains small, i.e. close to zero for Burundi, Uganda and Tanzania and close to 1% for Kenya and Rwanda. Our analysis also shows that not taking trade in intermediate goods into account leads to the overestima-

[1]Based on the Comtrade database, the import share of intermediate goods in Kenya was equal to 56%, 55% in Burundi, 41% in Rwanda, 54% in Tanzania, 50% in Uganda. Intermediate goods refer to UNCTAD-SoP2 and UNCTAD-SoP4 HS6 groups

tion of the effect of the EAC.

The remainder of the paper is organized as follows. In Section II, the data and the empirical strategy are presented. Section III discusses the main results regarding trade creation. Section IV presents the counterfactual analysis and the final section outlines the study's conclusion.

II. Preliminary results

A. *The model*

Our analysis is based on Caliendo and Parro (2015) who propose a multi-country and multi-sector Ricardian model (i.e. an extension of Eaton and Kortum, 2002). There are N countries and J sectors. Subscripts k and j are used for sectors, o and d for countries. Labour and intermediate goods are the inputs of production. Labour is paid w_d and is mobile between sectors but not between countries. This economy is composed of L representative households that maximize a Cobb-Douglas utility function of final goods denoted C_d^j, with α_d^j the preference parameter for these goods. A continuum of intermediate goods ω^j, also called materials, is produced in each sector. Producers of intermediate goods differ in their efficiency to produce by a factor $z_d^j(\omega^j)$ drawn from a Fréchet distribution with a location parameter λ_d^j that varies by country and sector, and a shape parameter θ^j that varies by sector j. The production function takes the form of Cobb-Douglas function with γ_d^{kj} the share of materials from sector k used in the production of intermediate good j, and γ_d^j the share of labour in this production function. Intermediate goods are produced under constant return to scale and firms evolve under perfect competition and set the price at the unit cost $c_d^j/z_d^j(\omega^j)$ with c_d^j the cost of an input given by:

$$c_d^j = A_d^j w_d^{\gamma_d^j} \prod_{k=1}^{J} (P_d^k)^{\gamma_d^{k,j}} \tag{1}$$

with

$$P_d^k = \left[\int p_d^k(\omega^k)^{1-\sigma^k} d\omega^k \right]^{1/(1-\sigma^k)} \tag{2}$$

where $p_d^k(\omega^k)$ is the lowest price of intermediate good ω^k across all location d, σ^k is the elasticity of substitution between intermediate goods within sector j, A_d^j is a constant and P_d^k the price index of intermediate goods. This equation clearly describes the sectoral linkages, where change in a price of one intermediate goods affects the costs of other products.

Producers in sector j in country d supply a composite intermediate good by purchasing intermediate goods ω^j from the lowest cost suppliers across countries. The production function of the composite goods takes the classical form proposed by Ethier (1982). These composite goods are used for the production of intermediate and final goods. The consumption price index is given by:

$$P_d = \prod_{k=1}^{J} (P_d^k / \alpha_d^k)^{\alpha_d^k} \tag{3}$$

Trade costs, κ, are iceberg costs and depend on tariffs and distance:

$$\kappa_{do}^j = \tilde{\tau}_{do}^j d_{do}^j \tag{4}$$

with $\tilde{\tau}_{do}^j = (1+\tau_{do}^j)$ where τ_{do}^j is the ad-valorem tariff and d_{do} the distance between o and d.

Using the properties of the Fréchet distribution, the expenditure shares, denoted π_{do}^j, takes the following form:

$$\pi_{do}^j = \frac{\lambda_o^j [c_o^j \kappa_{do}^j]^{-\theta^j}}{\sum_{h=1}^{N} \lambda_h^j [c_h^j \kappa_{dh}^j]^{-\theta^j}} \tag{5}$$

This share is thus just a function of prices, technologies and trade costs. Total expenditure on goods j, X_d^j, is the sum of the expenditures such as:

$$X_d^j = \sum_{k=1}^{j} \gamma_d^{j,k} \sum_{o=1}^{N} X_i^k \frac{\pi_{od}^k}{1+\tau_{od}^k} + Y_d \alpha_d^j \tag{6}$$

where the income I_d depends on wages w_d, tariff revenues R_d, and trade deficit D_d:

$$I_d = w_d L_d + R_d + D_d$$

B. The gravity equation

From the previous subsection, the total expenditure of country d on goods from o is given by:

$$X_{od}^j = \pi_{do}^j X_d^j$$

which observing (5), (6), adding time t and summing on sectors j takes the form of a general gravity equation:

$$X_{odt} = \frac{f_{ot} f_{dt}}{d_{odt}} \tag{7}$$

where f_{ot} and f_{dt} represent the comparative advantage of countries (productivity, costs) and the purchasing power of consumers (prices indices and incomes). f_{ot} is often considered as an indicator of the market access from o and/or called outward multilateral resistance because it represents a GDP share weighted measure of trade cost resistance that exporters in o face when shipping their goods to consumers on their own and outward markets. Concerning African RTAs, this term matter since different significant historical events (e.g. slavery, colonialism, preferential trade agreements[2]) have affected bilateral trade costs between African countries *relatively* to trade costs with distant countries. The term f_{dt} in this gravity equation is the accessibility-weighted sum of exporters-o capabilities also called inward multilateral resistance since it is a reversed measure of the openness of a nation to import from the world.

This gravity equation is estimated using the Poisson Pseudo-Maximum Likelihood (PPML) estimator[3] as follows:

$$X_{odt} = \exp\left(\alpha + f_{ot} + f_{dt} + f_{od} + \psi_1 EAC_{odt} + \psi_2 RTA_{odt} + \epsilon_{odt}\right) \tag{8}$$

where f_{ot} and f_{dt} are time-varying countries-specific effects approximating exporting and importing capacity at time t, α is a constant. Trade flows X_{odt} come from the bilateral TRADe HISTorical series, TRADHIST, a database from the CEPII (see Fouquin and Hugot, 2016) over the period 1965-2012. Respectively the dummy EAC_{odt} (RTA_{odt}) takes one at year t when the EAC (another RTA) enters into force and zero otherwise. These dummies come from Jeffrey Bergstrand's homepage[4].

To control for bilateral determinant of trade, f_{od}, we use a vector of dummies coming from the database GEODIST of the CEPII. These binary variables take one when countries are contiguous (called *Contiguity*), when a country was the colonizer of its trade partner (called *Colony*), when two countries had the same colonizer (called *Common Colony*), when the two countries were part of the same country (*Same Country*), when at least 9% of the population in both countries speak the same language (*Official Language*) and when two countries share a least

[2]The first Generalized System of Preferences were non-reciprocal schemes implemented by the European Economic Community and Japan in 1971 and by the USA in 1976, i.e. only a few decades after the wave of Independence, to facilitate LDCs access to markets of rich countries. See Candau and Jean (2009) for a detailed analysis on the utilisation of these trade preferences in Africa.

[3]To take into account that many countries do not trade bilaterally (leading to consider an estimator dealing with zeroes and heteroskedasticity), the trade literature has adopted the PPML approach proposed by Santos Silva and Tenreyro (2006). See Head and Mayer (2014) for a discussion and a comparison with the generalized Tobit proposed by Eaton and Kortum (2001).

[4]https://www3.nd.edu/~jbergstr/ 2017

one ethnic language (*Ethnic Language*). Since this strategy to add arbitrarily variables may raise doubt regarding the possibility of endogenous bias due to omitted variables, we compare with estimations including bilateral fixed effects f_{od} to control for all unobserved time-unvarying bilateral determinants of export (Baier and Bergstrand, 2007; Magee, 2008).

As explained in the introduction, the first EAC agreement entered into force between 1967 and 1977 and the second one started in 2000. In order to quantify the distinct effect of these two waves of regionalization, we consider a binary variable, called 'EAC (1967-77)', taking one for members during the period 1967-1977 and zero otherwise, and another dummy, called 'EAC (2000-12)', taking 1 between 2000 and 2012.

Table (II.1, Column 1) presents a standard gravity equation with GDPs, distance and bilateral controls (dummies for contiguity, past colonial links, common language, common history such as the fact that countries have belong to the same country in the past). This specification is typically the one used in past studies and leads to conclude that the EAC (1967-77) has fostered trade while the most recent agreement has not been significant. However, from a theoretical point of view, this estimation is not reliable since many omitted terms that are country specifics (e.g. price indices) are correlated with trade cost terms (e.g. distance and RTAs). Then in Table (1, Column 2), fixed effects by exporter and importer are introduced. Fally (2015) demonstrates that estimating a gravity equations using the PPML estimator with these fixed effects is equivalent to introduce the 'multilateral resistance' presented in theoretical models (*à la* Anderson and Van Wincoop, 2004). According to this estimation, the EAC promotes trade but in too strong way to be credible ($(e^{2.99} - 1) * 100 = 1800\%$). The introduction of time-varying individual effects in Column 4 does not resolve this problem of over-estimation of the RTAs' coefficient. The set of binary dummies (such as common language, colonial ties, etc) *imperfectly* control for all the bilateral links between countries that explain trade flows. Countries that have enforced the EAC are certainly also characterized by other unobserved bilateral factors and thus the endogenous bias of omitted variables is still problematic to consider seriously the coefficient of RTAs in this specification. The last Column 4 is thus our preferred estimation since bilateral fixed effects are introduced resolving all the aforementioned problems. The conclusion of this last regression is exactly the reverse of the naïve estimation done in Column 1, the current EAC (2000-12) has been a significant factor of trade growth, whereas the historical EAC (1967-77) was inefficient. The impact of the new EAC (2000-12) that increase trade by 75% ($e^{0.564} - 1$) is very close to the estimation of the trade effect obtained in Europe (68%) and smaller than the coefficient obtained for the NAFTA (145%) according to the meta-analysis of Cipollina and Salvatici (2010).

TABLE II.1—GRAVITY RESULTS

	(1)	(2)	(3)	(4)
$EAC(1967-77)$	1.348***	3.286***	1.767***	0.045
	(0.469)	(0.348)	(0.499)	(0.175)
$EAC(2000-12)$	-0.250	2.710***	2.998***	0.564**
	(0.466)	(0.388)	(0.403)	(0.256)
$Other\,RTA$	0.062	0.523***	0.521***	0.107***
	(0.077)	(0.056)	(0.059)	(0.026)
$Exporters\,GDP$	0.773***	0.603***		
	(0.015)	(0.034)		
$Importers\,GDP$	0.788***	0.560***		
	(0.019)	(0.034)		
$Distance$	-0.519***	-0.550***	-0.558***	
	(0.038)	(0.027)	(0.028)	
$Contiguity$	0.513***	0.469***	0.446***	
	(0.100)	(0.074)	(0.076)	
$Official\,language$	-0.081	-0.149	-0.158	
	(0.158)	(0.111)	(0.111)	
$Ethnic\,language$	0.420***	0.330***	0.355***	
	(0.141)	(0.112)	(0.112)	
$Colony$	-0.034	0.264***	0.246***	
	(0.113)	(0.087)	(0.086)	
$Comon\,Colony$	0.531**	0.333**	0.326**	
	(0.266)	(0.149)	(0.149)	
$Same\,country$	0.807***	0.163	0.168	
	0.314	(0.174)	(0.179)	
Observations	874,163	874,163	918,852	835,315
Pseudo R-square	0.88	0.93	0.94	0.99
Pseudolikelihood	-5.27455e+13	-2.88938e+13	-2.52816e+13	-4.610e+12
Importers FE	No	Yes	No	No
Exporters FE	No	Yes	No	No
Importer × time FE	No	No	yes	Yes
Exporters × time FE	No	No	yes	Yes
Pairs FE	No	No	No	Yes

Note: robust dyad Clustered Standard errors are reported in parentheses with ***, ** and * respectively denoting significance at the 1%, 5% and 10% levels. Estimations have been done with PPML estimator.

To paraphrase Allen, Arkolakis and Takahashi (2019) many trade models lead to the "universal gravity" described by Equation (7), which makes the results of this section particularly general. However to run a credible counterfactual analysis, we need to scratch beneath the surface of this gravity equation and to come back on the theoretical model. In particular in order to assess trade

diversion. Indeed, the EAC by impacting on the relative prices of goods and on multilateral resistances, leads to a reallocation of the demand, diverting trade from outside; but importer-year and exporter-year effects typically capture these diversion effects in our gravity equation. In other words, the coefficient of the EAC presented here is conditioned to trade diversion, it only represents the *pure* trade creation effect. On the contrary, resolving the model leads to take into account multilateral resistances and thus trade diversion.

III. Quantitative analysis

A. How to resolve the model

Following a long tradition in international trade, the model is solved for changes in prices and wages after a discrete change in tariff from τ to τ'. All the variables that are affected by this new tariff are analyzed in relative change and denoted with a "hat" (i.e. $\hat{x} = x'/x$). Then the equilibrium is get from the following equations with the cost of the input:

$$\hat{c}_d^j = \hat{w}_d^{\gamma_d^j} \prod_{k=1}^{J} (P_d^k)^{\gamma_d^{k,j}}, \tag{9}$$

the price index:

$$\hat{P}_d^j = \left[\sum_{o=1}^{N} \pi_{do}^j [\hat{\kappa}_{do}^j \hat{c}_0^j]^{-\theta^j} \right]^{\frac{-1}{\theta^j}} \tag{10}$$

the trade share:

$$\hat{\pi}_{do}^j = \left[\frac{\hat{\kappa}_{do}^j \hat{c}_0^j}{\hat{P}_d^j} \right]^{-\theta^j} \tag{11}$$

These equations (with the total expenditures and the trade balance equation) give the equilibrium in relative changes. As it well known now, the great advantage of this system is that it can be resolved with few data and estimations. Only tariffs, trade shares, value added and their share and the sectoral dispersion of productivity are necessary. The trade elasticities are here directly determined by the dispersion of productivity θ^j which are the only parameters that need to be estimated for the quantitative trade policy evaluation of the EAC.

B. Taking the Model to the Data

Elasticities

Evaluation of trade policy welfare gains depend crucially on trade elasticities. With a high θ^j, the productivity is concentrated and goods are not substitute. As a result a change in tariff will not have a strong effect on the share of traded goods because producers of the composite aggregate are less likely to change their suppliers. This means that our results depend on the values of these elasticities. Following Mejean and Imbs (2017) we propose to use two different estimates of θ^j:

First, we use the sectoral elasticities of Caliendo and Parro (2015). These authors use the expenditure share (5) and a triple differentiation to estimate only from tariffs these elasticities, reported in Table (III.1).

Secondly, we estimate these elasticities from the method of Feenstra (1994), Broda and Weinstein (2006) and Soderbery (2018).

Formally, following Feenstra (1994), demand and supply trade elasticities are estimated from a single equation that takes the following form:

$$(\triangle^i lnP_{dkt})^2 = \alpha_k(\triangle^i lnS_{dkt})^2 + \beta_k(\triangle^i lnS_{dkt})(\triangle^i lnP_{dkt}) + \varepsilon_{dkt} \tag{12}$$

where S_{dkt} and P_{dkt} are respectively country d trade share and price of product k at time t. In order to eliminate time specific effect, all variables are first differentiating ($\triangle$). We estimate this equation with the Limited Information Maximum Likelihood (LIML) hybrid estimator proposed by Soderbery (2018). This estimator corrects for small sample bias and outliers observations effects. Its constrained non linear routine corrects grid search inefficiencies introduced by Broda and Weinstein (2006). The estimation of this equation gives trade price elasticity relative to a reference country i (here Zambia). The coefficient of interest here is the elasticity of the trade share α_k.

Table III.1 presents these trade elasticities, the range is from 1.32 to 22.63 showing strong heterogeneity across sectors. Since these two methods provide different results, they represent a interesting way to lead sensitivity analysis of the model and to test the robustness of our findings.

Table III.1—Sectoral trade elasticities

Eora sectors	Feenstra	Caliendo&Parro
Agriculture	3.584	9.11
Fishing	2.037	9.11
Mining and Quarrying	2.832	13.53
Food & Beverages,	3.268	2.62
Textiles and Wearing Apparel	3.844	8.1
Wood and Paper	6.742	14.846
Petroleum, Chemical, Non-Metallic Mineral Prod	4.944	18.015
Metal Products	22.638	5.135
Electrical and Machinery	3.991	7.994
Transport Equipment	1.324	1.115
Other Manufacturing	3.271	1.98

Note: Caliendo and Parro ISIC Rev 3 are converted in EORA classification through the classification proposed by Manfred et al (2013)

Data

Value added (V_d^j) and gross production (Y_d^j) come from the EORA global supply chain database. This database consists of a multi-region input-output time series (1990-2015) for 26 sectors and 190 countries. Bilateral trade flows come from United Nation statistical division Commodity Trade (COMTRADE) database using The Harmonized Commodity Description and Coding System (HS) 1996 at 6 digit level of aggregation. In order to maintain a single classification, trade flows are converted to EORA classification. This is done in two steps. First, by using the World Integrated Trade Solutions (WITS) correspondence table, we move from the HS nomenclature to the 4-digit ISIC Rev 3 nomenclature. Then, the transition from ISIC to EORA classification is made through the classification proposed by Manfred et al (2013). Bilateral tariff data at the sectoral level come from United Nation Conference on Trade And Development Trade Analysis Information System (UNCTAD-TRAINS) for the year 1999 and 2009. Our counterfactual exercise covers 11 tradable sectors as well as 48 countries[5], including an aggregated rest of the world. These countries and sectors are the same as those used to estimate trade elasticities. Finally concerning trade data we used the BACI database provided by CEPII.

C. Tariff, real wage and welfare

To understand the result of the quantitative model, it is useful to decompose the effect of tariffs on real wage and welfare.

Using the cost function (9) with trade share (11), the counterfactual change in real wages is solved in each sector j as a function of the share of expenditure

[5]Appendix A, gives the list of countries used in this study.

on domestic goods and sectoral prices. Using this expression in the consumption expenditure shares, gives the following expression:

$$(13)\quad ln\,\frac{\hat{w}_d}{\hat{P}_d} = -\sum_{j=1}^{J}\frac{\alpha_d^j}{\theta^j}ln\,\hat{\pi}_{dd}^j - \sum_{j=1}^{J}\frac{\alpha_d^j}{\theta^j}\frac{1-\gamma_d^j}{\gamma_d^j}ln\,\hat{\pi}_{dd}^j - \sum_{j=1}^{J}\frac{\alpha_d^j}{\gamma_d^j}ln\,\prod_{k=1}^{J}\left(\hat{P}_d^k/\hat{P}_d^j\right)^{\gamma_d^{k,j}}$$

Changes in real wages depend on three components. The economic conditions in the final sector, $-\sum_{j=1}^{J}\frac{\alpha_d^j}{\theta^j}ln\,\hat{\pi}_{dd}^j$, and in the intermediate good, $-\sum_{j=1}^{J}\frac{\alpha_d^j}{\theta^j}\frac{1-\gamma_d^j}{\gamma_d^j}ln\,\hat{\pi}_{dd}^j$ and finally of changes in sectoral and consumer prices, $-\sum_{j=1}^{J}\frac{\alpha_d^j}{\gamma_d^j}ln\,\prod_{k=1}^{J}\left(\hat{P}_d^k/\hat{P}_d^j\right)^{\gamma_d^{k,j}}$. Then, changes in wages depends on sectoral elasticities and on the share of the final demand. The higher the ratio between sectoral elasticities and the share of final demand growth, the greater the effects on real wages, even if there are small variations in domestic spending. In a similar way, the share of value added of intermediate goods in the production matters. The higher this parameter increases, the less significant the impact on real wages is. In the model without intermediate goods (we make this assumption in the last part of the paper), the aggregate effect of tariff reduction on producers of these goods does not play any role on the welfare. Indeed, there are no reduction in the price of intermediate goods and so the gain coming from the decrease in the cost of production is simply not taken into account. Lastly, sectoral linkages are impacted by the ratio between the share spent on final goods and the share of value added in production. As this ratio increases, the effect of sectoral linkages on real wages increases.

Totally differentiating the welfare function of the representative consumer in country d yields:

$$(14)\quad d\,ln\,W_d = \frac{1}{I_d}\sum_{j=1}^{J}\sum_{o=1}^{N}\left(E_{do}^j d\,ln\,c_d^j - M_{do}^j d\,ln\,c_o^j\right) + \frac{1}{I_d}\sum_{j=1}^{J}\sum_{o=1}^{N}\tau_{do}^j M_{do}^j\left(d\,ln\,M_{do}^j - d\,ln\,c_o^j\right)$$

This expression enables to decompose the welfare impact of tariffs into terms of trade and volume of trade effects across countries and sectors. The terms of trade given by the first part of equation (14) measure the gains of an increase in exporter prices relative to a change in importer prices from tariff reduction. This component impacts the welfare through the sectoral deficit and sectoral prices. The second part represents the volume of trade and measures the gain of an increase in the volumes of trade from tariff reduction.

At the national level, the change in bilateral Terms of Trade (hereafter denoted ToT_{do}) and the change in the bilateral Volume of Trade (VoT_{do}) are respectively given by:

$$ToT_{do} \equiv \sum_{j=1}^{J} \left(E_{do}^{j} \triangle ln\, c_{d}^{j} - M_{do}^{j} \triangle ln\, c_{o}^{j} \right), \tag{15}$$

$$VoT_{do} \equiv \sum_{j=1}^{J} \tau_{do}^{j} M_{do}^{j} \left(\triangle ln\, M_{do}^{j} - \triangle ln\, c_{o}^{j} \right). \tag{16}$$

The change in the sectoral terms of trade and volume of trade are similarly given by:

$$ToT_{d}^{j} \equiv \sum_{i=1}^{N} \left(E_{do}^{j} \triangle ln\, c_{d}^{j} - M_{do}^{j} \triangle ln\, c_{o}^{j} \right), \tag{17}$$

$$VoT_{d}^{j} \equiv \sum_{i=1}^{N} \tau_{do}^{j} M_{do}^{j} \left(\triangle ln\, M_{do}^{j} - \triangle ln\, c_{o}^{j} \right). \tag{18}$$

Then the welfare change takes the following form:

$$\triangle\, ln\, W_{d} = \frac{1}{I_{d}} \sum_{j=1}^{J} \left(VoT_{d}^{j} + ToT_{d}^{j} \right) \tag{19}$$

Using data from I-O tables, trade flows (M_{do}^{j}), value added (V_{d}^{j}) and gross production (Y_{d}^{j}) we get π_{do}^{j}, γ_{d}^{j}, $\gamma_{d}^{j,k}$ and α_{d}^{j}, and with the estimates of sectoral productivity dispersion θ^{j}, we can solve the model for tariff changes in order to study how real wages (13) and welfare (14, 15, 16, 17, 18) have been affected by the EAC and by trade liberalization in general.

IV. Main results

With the model, data and estimations in hand, we now turn to simulations of the EAC trade integration. We also propose additional results by modifying important assumptions (number of sectors, sectoral linkages, trade deficit).

A. Ceteris Paribus: the EAC

Country analysis

To compute the effect of the EAC, we make two different shocks and our analysis of the EAC is based on the difference between these shocks. This methodology is

typically the one proposed by Caliendo and Parro (2015) to study the impact of the NAFTA given world tariff changes or by Mayer et al. (2019) to revisit the cost of Non-Europe. In each cases we calibrate the model on the year 1999 when the EAC has been signed, i.e. before its implementation, and we take into account trade deficits. In the first shock, we introduce the observed change in world tariff structure from 1999 to the year 2009 including changes due to the EAC. In the second shock, we still consider the observed change in world tariff structure from 1999 to the year 2009 but holding EAC tariffs fixed. The difference between these two simulations allows to isolate the effect of the EAC from other changes in the world.

In all tables, we present the simulations done with the elasticities of θ^j obtained from the two methodologies presented previously.

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology

	Welfare			
Country	Total	Term of Trade	Volume of Trade	Real wage
Burundi	0,10%	-0,35%	0,45%	-1,30%
Kenya	0,89%	0,59%	0,30%	2,40%
Rwanda	1,10%	-0,30%	1,40%	-1,20%
Tanzania	0,31%	-0,09%	0,40%	-0,28%
Uganda	0,03%	-0,39%	0,42%	-1,70%

Counterfactuals based on elasticities computed from Feenstra's Methodology

	Welfare			
Country	Total	Term of Trade	Volume of Trade	Real wage
Burundi	-0,42%	-0,76%	0,22%	-3,40%
Kenya	1,10%	0,83%	0,22%	3,20%
Rwanda	0,43%	-0,48%	0,92%	-3,20%
Tanzania	0,08%	-0,18%	0,26%	-0,93%
Uganda	-0,30%	-0,51%	0,21%	-2,50%

Table IV.1—Welfare Effects of EAC's tariff reductions

In Table (IV.1, Column 1), we provide results concerning welfare change (Equation 14) and in Column 2 and 3 we decompose the effect of the EAC by analyzing changes in the terms of trade and in the volume of trade (Equations 15, 16). Finally Column 4 provides the impact of the EAC on real wages (Equation 13). The main result of this analysis is that the EAC increases the welfare of individuals in the five countries of the trade bloc. These gains are however small for some countries. Kenya and Rwanda benefits of an increase of well-being of approximately 1% but gains in Tanzania, Burundi and Uganda are negligible. For the latter two countries, the counterfactual done with the Feenstra's elasticities (at the bottom of Table IV.1), shows that the impact of the EAC is even detrimental. In fact for these two countries, and to a lesser extent for Tanzania, this customs

union has fostered the volume of trade but has also generated an equivalent deterioration of the terms of trade. In other words, while we can be confident about the welfare improvement in Kenya and Rwanda, the consequence of the EAC for Tanzania, Burundi and Uganda is less clear. The case of Kenya is particularly interesting since this country is the sole to improve its term of trade thanks to the EAC. To understand this result, first note that the material prices decrease between 0.07% and 2.51% in all countries excepted in Kenya where these prices increase by 2.58%. Furthermore, wage increases by 6.26% in Kenya while in all other members this variable decreases strongly (a reduction between 2,50% and 13.02%). As a result, because export prices increase when change in wages is higher than the change in material prices, Kenya benefits of an appreciation of its terms of trade. The fact that the EAC leads to strong decrease in wages and to a small decrease in prices in Rwanda, Tanzania, Burundi and Uganda also explains the negative impact of the EAC on real wages in these countries (Column 4).

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology				
	Terms of Trade		Volume of Trade	
Country	EAC	Rest of the World	EAC	Rest of the World
Burundi	0,00%	-0,35%	1,10%	-0,64%
Kenya	0,05%	0,55%	0,06%	0,24%
Rwanda	-0,03%	-0,27%	3,20%	-1,80%
Tanzania	-0,02%	-0,08%	0,76%	-0,36%
Uganda	-0,07%	-0,32%	0,90%	-0,48%

Counterfactuals based on elasticities computed from Feenstra's Methodology				
	Terms of Trade		Volume of Trade	
Country	EAC	Rest of the World	EAC	Rest of the World
Burundi	0,00%	-0,76%	0,75%	-0,41%
Kenya	0,06%	0,77%	0,02%	0,21%
Rwanda	-0,04%	-0,44%	1,90%	-0,98%
Tanzania	-0,02%	-0,15%	0,63%	-0,38%
Uganda	-0,09%	-0,42%	0,55%	-0,34%

Table IV.2—Bilateral welfare effects from EAC's tariff reductions

So far, trade diversion has not been caught, to tackle it, Table (IV.2) decomposes the terms of trade and the volume of trade by considering exchanges between countries of the EAC and with the rest-of-the world. In Column 1 and 2, we verify that the previous results about the deterioration of the terms of trade mainly comes from a deterioration with the rest-of-the world. Column 3 displays the trade creation effect of the EAC, already found in a different way in our section concerning the gravity equation. Finally Column 4 presents clear evidence of

trade diversion. This trade diversion has been particularly significant in Rwanda and in Burundi. These countries are also the ones where the trade creation has been the strongest. These results are robust to change in trade elasticities (Table at the bottom of IV.2).

Sectoral analysis

The table (IV.3) presents the sectoral contribution on welfare (still with the elasticities obtained from Caliendo and Parro (2015) and computed from Feenstra (1994), Broda and Weinstein (2006) and Soderbery (2018)).

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology

	Burundi		Kenya		Rwanda		Tanzania		Uganda	
Sectors	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade
Agriculture	95,60%	3,80%	82,30%	18,80%	85,80%	3,09%	66,10%	-0,44%	81%	-0,77%
Fishing	0,60%	0,40%	0,15%	0,01%	0,03%	-0,58%	0,71%	0,00%	0,53%	0,02%
Mining & Quarrying	0,88%	5,03%	1,87%	4,68%	5,15%	2,12%	10,70%	0,26%	0,89%	2,15%
Food & Beverages	-0,16%	13,60%	3,39%	4,16%	-0,29%	24,00%	5,40%	5,63%	3,64%	6,61%
Textiles & Wearing	0,78%	18,10%	1,99%	2,89%	0,29%	6,24%	1,12%	1,22%	0,54%	5,84%
Wood & Paper	-0,02%	16,60%	0,80%	5,73%	0,28%	16,40%	1,00%	23,00%	0,70%	20,20%
Petroleum, Chemicals*	1,82%	47,90%	7,46%	43,30%	7,48%	48,30%	9,32%	68,40%	10,60%	74,10%
Metal Products	0,18%	5,44%	0,84%	4,40%	0,95%	2,05%	2,70%	3,57%	1,53%	2,26%
Electrical & Machinery	0,09%	-5,46%	0,74%	10,30%	0,13%	-1,70%	1,70%	-0,67%	0,65%	-7,64%
Transport Equipment	0,10%	-5,74%	0,31%	4,81%	0,15%	-0,62%	0,65%	-1,02%	0,35%	-2,61%
Other Manufacturing	0,09%	0,35%	0,15%	0,85%	0,05%	0,72%	0,68%	0,03%	0,08%	0,20%

Counterfactuals based on elasticities computed from Feenstra's Methodology

	Burundi		Kenya		Rwanda		Tanzania		Uganda	
Sectors	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade	Terms of Trade	Volume of Trade
Agriculture	98,00%	3,91%	82,00%	9,70%	88,60%	0,99%	69,20%	-1,49%	79%	-1,92%
Fishing	0,40%	0,03%	0,11%	0,03%	0,02%	-0,91%	0,57%	0,00%	0,31%	0,00%
Mining & Quarrying	0,58%	0,36%	1,18%	3,39%	2,90%	0,25%	6,02%	-0,75%	0,91%	0,31%
Food & Beverages	-0,03%	21,50%	4,42%	7,08%	-0,25%	43,30%	6,81%	9,93%	5,14%	19,60%
Textiles & Wearing	0,53%	7,16%	2,07%	3,13%	0,26%	3,24%	1,11%	0,11%	0,57%	2,04%
Wood & Paper	0,03%	2,49%	0,86%	5,09%	0,28%	4,22%	0,89%	6,53%	0,76%	9,66%
Petroleum, Chemicals*	1,22%	-12,90%	6,84%	31,70%	7,01%	23,30%	7,10%	14,40%	10,60%	18,40%
Metal Products	-0,94%	104,00%	1,19%	14,40%	0,87%	29,00%	5,64%	80,80%	1,72%	74,30%
Electrical & Machinery	0,07%	-12,20%	0,79%	15,40%	0,14%	-3,63%	1,42%	-6,32%	0,69%	-15,60%
Transport Equipment	0,12%	-15,20%	0,33%	8,62%	0,12%	-1,63%	0,51%	-3,28%	0,38%	-6,75%
Other Manufacturing	0,05%	0,65%	0,17%	1,50%	0,05%	1,83%	0,75%	0,04%	0,08%	-0,05%

Table IV.3—Sectoral contribution to welfare effects from EAC's tariff reductions (with elasticities from Caliendo and Parro's Methodology)

The agricultural sector is the sector which explains the bulk of our results concerning the deterioration of the terms of trade in Burundi, Uganda, Rwanda and Tanzania and the appreciation of them in Kenya. Petroleum and Chemicals also have a significant contribution in almost all countries (excepted in Burundi). For instance in Uganda the deterioration is mainly explained by two sectors, Agriculture and Petroleum/Chemicals which contribute to 90% of the reduction in the terms of trade. This result, that most of the aggregate change in terms of trade is explained by few sectors is also found by Caliendo and Parro (2015).

In their analysis of the NAFTA, this result comes from the strong input-output feedback in three sectors (Electrical Machinery, Communication Equipment, and Autos). In the EAC, such a possibility is credible for Chemicals and Agriculture (think to fertilizers), but the main explanation lies in the strong reduction of tariffs in the sectors that stand out from the rest. For instance the agricultural sector has recorded the most significant reduction in tariffs (see Appendix A, Table VI). This reduction is magnified by the share of materials used in the production. Indeed large shares of materials and strong reductions in tariffs have large impact on sectoral export prices and then on the sectoral contribution on welfare. Three of five countries had in 1999 very high tariffs (above the mean and median), for instance, Burundi applied a tariff of 26% (while the mean and the median across sectors were of 24% and 20%). Consequently, the reduction of tariffs in the agricultural sector (from 26% to 5% in 2009) explains the strong contribution of this sector to change in price and volume.

The impact on the volume of trade has been more balanced. But there are some sectors with strong contribution such as Textile and Wearing in Burundi, Electrical and Machinery in Kenya, Food and Beverages in Rwanda and Wood and Paper in Uganda and Tanzania. In each cases, the strong decreases in the degree of protection linked to the concentration of productivity explains these results. Finally in all countries, the Petroleum and Chemicals sector matter to explain the volume of trade. This sector is a relatively homogeneous sector and then even a small change in tariffs has a strong impact on trade since it is easy to find substitute suppliers (i.e this sector is characterized by a relatively high elasticity, $\theta^j \simeq 5$ in our analysis based on Feenstra and four time higher according to Caliendo and Parro (Table 1, $\theta^j \simeq 18$)).

To study how the EAC has affected sectoral specialization, Table (IV.4) presents export shares by industry before and after the EAC trade integration. The interesting result is that the customs union has succeeded to slightly diversify these economies. In all countries, the export share of agricultural product has decreased leaving place mainly to the Petroleum and Chemicals sector but also to other sectors. For instance in Kenya, the agricultural sector account for 66% of the total export before the EAC, while after this trade integration shock, the concentration of exports in this sector is halved (33%). Rwanda exports more Wood and Paper, Metal Products and other Manufacturing goods. In Tanzania and Uganda, the decrease in the share of the agricultural sector seems to have been compensated by the increase in the share of export coming from the Petroleum and Chemicals sector. The Herfindhal Index at the bottom of Table (IV.4) confirms this diversification of economies.

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology										
	Burundi		Kenya		Rwanda		Tanzania		Uganda	
Sectors	Before	After	Before	After	Before	After	Before	After	Before	After
Agriculture	95,00%	94,00%	66,00%	33,00%	84,00%	81,00%	70,00%	61,00%	92%	82,00%
Fishing	0,51%	0,51%	0,11%	0,11%	0,00%	0,00%	0,74%	0,64%	0,56%	0,51%
Mining & Quarrying	2,90%	2,60%	2,40%	1,90%	12,00%	10,00%	13,00%	12,00%	0,24%	0,23%
Food & Beverages	0,43%	0,50%	9,40%	7,00%	0,45%	0,34%	7,50%	8,30%	5,80%	5,50%
Textiles & Wearing	0,08%	0,10%	3,40%	3,00%	0,10%	0,13%	1,50%	1,70%	0,16%	0,53%
Wood & Paper	0,11%	0,40%	1,50%	6,70%	0,22%	1,10%	0,54%	1,80%	0,08%	3,00%
Petroleum, Chemicals*	0,11%	1,30%	13,00%	44,00%	1,60%	5,60%	3,10%	11,00%	0,61%	7,20%
Metal Products	0,01%	0,01%	1,70%	2,40%	0,58%	1,00%	1,40%	1,20%	0,21%	0,30%
Electrical & Machinery	0,06%	0,12%	2,00%	0,18%	0,62%	0,72%	1,40%	0,36%	0,57%	2,44%
Transport Equipment	0,28%	0,32%	0,61%	0,44%	0,03%	0,09%	0,09%	0,17%	0,18%	2,79%
Other Manufacturing	0,00%	0,00%	0,20%	0,16%	0,02%	2,20%	1,10%	0,98%	0,01%	0,02%
Normalized Herfindahl	0,91	0,88	0,44	0,28	0,72	0,65	0,49	0,38	0,84	0,67

Counterfactuals based on elasticities computed from Feenstra's Methodology										
	Burundi		Kenya		Rwanda		Tanzania		Uganda	
Sectors	Before	After	Before	After	Before	After	Before	After	Before	After
Agriculture	96,00%	96,00%	65,00%	41,00%	90,00%	85,00%	69,00%	64,00%	89%	85,00%
Fishing	0,34%	0,32%	0,08%	0,06%	0,00%	0,00%	0,55%	0,50%	0,32%	0,30%
Mining & Quarrying	2,10%	2,00%	1,50%	1,10%	6,00%	5,00%	7,00%	6,40%	0,16%	0,15%
Food & Beverages	0,57%	0,73%	12,00%	10,00%	0,75%	0,64%	10,00%	12,00%	8,40%	9,20%
Textiles & Wearing	0,10%	0,10%	3,50%	2,80%	0,13%	0,13%	1,60%	1,60%	0,17%	0,26%
Wood & Paper	0,12%	0,16%	1,60%	2,20%	0,26%	0,44%	0,57%	0,68%	0,07%	0,37%
Petroleum, Chemicals*	0,09%	0,19%	12,00%	13,00%	1,30%	1,50%	2,50%	3,20%	0,49%	1,00%
Metal Products	0,03%	0,04%	2,40%	27,00%	1,40%	6,70%	7,00%	9,70%	0,72%	3,30%
Electrical & Machinery	0,07%	0,10%	1,50%	1,50%	0,23%	0,40%	0,77%	0,99%	0,38%	0,44%
Transport Equipment	0,30%	0,35%	0,63%	0,53%	0,04%	0,04%	0,10%	0,10%	0,17%	0,21%
Other Manufacturing	0,00%	0,00%	0,23%	0,23%	0,03%	0,05%	1,20%	1,20%	0,01%	0,04%
Normalized Herfindahl	0,92	0,92	0,42	0,24	0,80	0,72	0,47	0,41	0,79	0,72

TABLE IV.4—SECTORAL EXPORT SHARES

B. Trade in intermediate goods matters

We now analyze how results are modified by some important changes in the model assumptions, especially when we remove the presence of Input-Output, when we consider only one sector and when we drop intermediate goods. The model without I/O and without materials are multi-sector models, thus comparing the results of these model (Column 1 and 3) with the one sector model (Column 2) shows that both intermediate goods and input-output linkages amplify the welfare effects of the EAC. We can also note that there are few differences between the model without I/O and the model without materials. Only the gains in Kenya and in Uganda slightly increase from respectively 1.54% to 1.55% and from 0.23% to 0.24% when we compare the two models. Similar small changes are also found for the NAFTA concerning the U.S. and Canada (the welfare varies by respectively 0.01% and -0.01%), but with a noticeable difference concerning Mexico where the model with intermediate goods leads to predict a 0.16% increases in the welfare gain (see Caliendo and Parro (2015, Table 11)). Clearly members of the EAC are similar developed countries not characterized by the kind of vertical specialization

in the manufacturing sector that the NAFTA has fostered in Mexico. In fact the introduction of intermediate goods and I/O feedback leads to reduce the welfare gains obtained thanks to the EAC for all countries excepted for Kenya (compare our benchmark result in (IV.1) with the Table (IV.5) below). Models that do not take into account intermediate goods and the heterogeneity of sectors leads to overestimate the positive impact of the EAC in Burundi, Rwanda, Tanzania and Uganda. Furthermore, this table also shows that the main result of our baseline (see Table, IV.1) are robust to significant change in assumptions: welfare gains are small and the main winners are Kenya and Rwanda.

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology			
	Welfare		
Country	Without I/O	One sector	No materials
Burundi	0,33%	0,23%	0,33%
Kenya	0,65%	0,85%	0,65%
Rwanda	1,55%	1,48%	1,54%
Tanzania	0,40%	0,43%	0,40%
Uganda	0,24%	0,04%	0,23%

Counterfactuals based on elasticities computed from Feenstra's Methodology			
	Welfare		
Country	Without I/O	One sector	No materials
Burundi	0,03%	0,23%	0,03%
Kenya	0,70%	0,85%	0,70%
Rwanda	0,83%	1,48%	0,82%
Tanzania	0,31%	0,43%	0,31%
Uganda	-0,05%	0,04%	-0,04%

Table IV.5—Welfare gains and trade effects from EAC tariff changes 1999 - 2009 (%)

C. About Trade Deficit

The previous analysis was not based on the raw observed data but on the counterfactual equilibrium that eliminates aggregate deficits in all countries. The trade balance assumption is commonly used in many general equilibrium models despite its highly unrealistic nature. However, in most cases, the introduction of a trade imbalance does not affect the outcome (see Dekle et al., 2007). This is also the case for the EAC.

Table (IV.6) shows that when we take into account trade deficits, there are small welfare gains for all members. Countries that benefit the most are still Kenya and Rwanda.

Impact of real wages is less negative which is quite logical since the trade balance assumption leads to strong adjustment of nominal wages. The current analysis

thus leads to have a more optimistic point of view regarding the impact of the EAC on real wages in particular in Rwanda (in Kenya the effect was already positive with a percentage of 2.4% compare to 2.3% now, and in Tanzania the percentage is now positive but however small).

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology				
	Welfare			
Country	Total	Terms of Trade	Volume of Trad	Real Wages
Burundi	0,04%	-0,01%	0,05%	-0,66%
Kenya	0,34%	0,09%	0,25%	2,30%
Rwanda	0,16%	-0,03%	0,18%	1,00%
Tanzania	0,06%	0,00%	0,07%	0,26%
Uganda	0,03%	-0,03%	0,06%	-0,33%

Counterfactuals based on elasticities computed from Feenstra's Methodology				
	Welfare			
Country	Total	Terms of Trade	Volume of Trad	Real Wages
Burundi	0,03%	-0,01%	0,04%	-0,46%
Kenya	0,23%	0,08%	0,15%	1,70%
Rwanda	0,07%	-0,03%	0,10%	-1,30%
Tanzania	0,06%	0,00%	0,06%	0,22%
Uganda	0,02%	-0,03%	0,05%	-0,31%

TABLE IV.6—WELFARE EFFECTS FROM EAC TARIFF REDUCTIONS, WITH TRADE DEFICIT

Table (IV.7) shows the evolution of the terms of trade and the volume of trade with EAC members and the rest of the world. Trade diversion is lower than previously found in a situation without a deficit (compare with Table, IV.2). The overall picture is however similar to what has been obtained with trade balance.

Counterfactuals based on elasticities computed from Caliendo and Parro's Methodology				
	Terms Of Trade		Volume of Trade	
Country	EAC	Rest of the World	EAC	Rest of the World
Burundi	-0,01%	0,00%	0,39%	-0,34%
Kenya	0,02%	0,07%	0,01%	0,24%
Rwanda	-0,02%	0,00%	1,20%	-1,00%
Tanzania	-0,01%	0,00%	0,18%	-0,12%
Uganda	-0,03%	-0,01%	0,36%	-0,30%

Counterfactuals based on elasticities computed from Feenstra's Methodology				
	Terms Of Trade		Volume of Trade	
Country	EAC	Rest of the World	EAC	Rest of the World
Burundi	-0,01%	-0,01%	0,26%	-0,22%
Kenya	0,02%	0,06%	0,01%	0,14%
Rwanda	-0,02%	-0,01%	1,00%	-0,91%
Tanzania	-0,01%	0,00%	0,11%	-0,05%
Uganda	-0,02%	-0,01%	0,24%	-0,19%

TABLE IV.7—BILATERAL WELFARE EFFECTS FROM EAC TARIFF REDUCTIONS, WITH TRADE DEFICIT

V. Conclusion

The debate about the benefit of RTAs has a long history. With regard to African countries, the consensus in the 1990s was based on little hope of trade creation and a high risk of trade diversion (Foroutan and Pritchett, 1993; Rodrik, 1998). However, the statistical tools and the data available at the time, prevented researchers from going beyond mere speculation. Using a structural gravity equation we provide consistent estimates of the trade creation effect of the EAC agreement. The flip side of this analysis is that by controlling for multilateral resistances, we cannot study trade diversion. Then we rely on the general equilibrium model proposed by Caliendo and Parro (2015) to assess the whole impact of the EAC. We find that this agreement deteriorates the terms of trade, diverts trade from the rest-of-the world and negatively affects real wages. Only Kenya and Rwanda record significant welfare gains. The good news for other countries, however, is in the sector analysis. Indeed, in all countries, the share of agricultural exports has declined, leaving room for other sectors. This structural change is welcome in countries where demographic profiles require job creation. In other words, although the static trade model presented here projects small welfare gains, it is possible that the structural change observed may be much more beneficial in the long term.[6]

[6]However, we observed an increasing share of oil and chemical exports that certainly represents development opportunities, but also, potential resource curses.

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VI. Appendix A

Imports (Millions of dollar)			
Country	Value	Country	Value
Argentina	89300	Ireland	76500
Australia	48200	Italia	254000
Austria	51200	Japan	330000
Burundi	413	Kenya	4520
Brazil	76400	Madagascar	782
Central African Rep.	157	Mexico	135000
Canada	119000	Mali	1460
Chili	25000	Mauritius	3940
China	122000	Malawi	1140
Côte d'Ivoire	10100	Nigeria	7760
Cameroon	2340	Norway	29200
Germany	480000	New Zealand	24300
Denmark	55000	Portugal	55600
Egypt	25700	Rwanda	387
Spain	110000	Sweden	51300
Ethiopia	2300	Togo	1060
Finland	34700	Tunisia	15000
France	338000	Turkey	47500
Gabon	1670	Tanzania	2650
United Kingdom	336000	Uganda	1760
Guinea	938	United States	1020000
Greece	72400	South Africa	25200
Indonesia	36500	Zambia	1420
India	66700	Rest of the World	1620000

Table VI.1—Flows by importers in 1999

	Imports Tariffs (%)									
	Burundi		Kenya		Rwanda		Tanzania		Uganda	
Sector	1999	2009	1999	2009	1999	2009	1999	2009	1999	2009
Agriculture	27,44	4,69	15,39	5,15	41,03	5,15	29,45	5,15	22,96	5,15
Fishing	40,00	20,00	15,97	20,00	60,56	20,00	39,51	20,00	29,02	20,00
Mining & Quarrying	10,86	3,73	14,18	3,73	13,13	3,73	22,97	3,73	10,86	3,73
Food & Beverages	38,09	24,63	19,80	24,95	78,32	24,95	33,66	24,95	43,61	24,95
Textiles & Wearing	34,75	21,07	19,51	21,09	49,81	21,09	18,85	21,09	23,33	21,09
Wood & Paper	20,56	14,90	18,19	14,90	39,67	14,90	29,98	14,90	18,34	14,90
Petroleum, Chemicals*	16,42	9,86	15,48	9,86	29,33	9,86	21,93	9,86	13,95	9,86
Metal Products	16,96	11,22	16,07	11,22	27,99	11,22	26,32	11,22	15,39	11,22
Electrical & Machinery	18,78	8,57	13,26	8,57	33,86	8,57	22,05	8,57	16,22	8,57
Transport Equipment	19,67	7,21	12,14	7,21	24,08	7,21	17,17	7,21	14,37	7,21
Other Manufacturing	34,90	22,05	20,55	22,05	64,86	22,05	26,92	22,05	26,01	22,05

TABLE VI.2—TARIFF CHANGES BETWEEN 1999 AND 2009