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**From EAC-6 to EAC 7: potentials and pitfalls of the  
enlargement of the East African Community**

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## **Abstract**

East Africa as a region is increasingly attracting attention, especially in view of its significant achievements since the turn of the Millennium. It has been documented that the region has a remarkable resilience despite tsunamis of negative foreign trade and investment shocks of the last decade. Policymakers in the region need to strengthen resilience by diversifying beyond gold, tourism, and traditional cash crops, boosting private sector backed growth and competitiveness, and preparing for competitiveness-led export growth. There is a need to ensure that the benefits of international specialization trickle down not only to strengthen economic growth, but also to create jobs and reduce poverty.

The stylized facts of applied gravity analysis are that regional integration has comparatively speaking progressed well in the EAC, that trade creation by far outweighs trade diversion and that EAC is the most advanced in terms of tariff liberalization. Given this existing body of knowledge, in this working paper, we focus on a relatively under-researched area where important differences exist between EAC member states, namely: the trade impact of the time and costs that firms incur when they comply with documentary requirements and border procedures. The gravity model is estimated using a panel dataset consisting of EAC, SADC, COMESA and their major trading partners for the period 2015 – 2018, applying the Poisson Pseudo Maximum Likelihood (PPML) estimator. Our empirical findings highlight that reducing time and costs for documentary requirements and crossing borders is an important issue within the EAC, especially since streamlining procedures, one stop portals, reducing handling time, as well as the use of common standards that facilitate EAC internal trade flows do not require large financial investments while they do have a high payoff. Considering economic arguments as a basis to form regional entities, our findings consistently stress the need to enhance the efficacy of the various regional trading blocs.

## **Keywords**

East African Community (EAC), Tanzania, Kenya DRC, South Sudan, Uganda, Rwanda, Burundi, gravity, productivity, economic integration.

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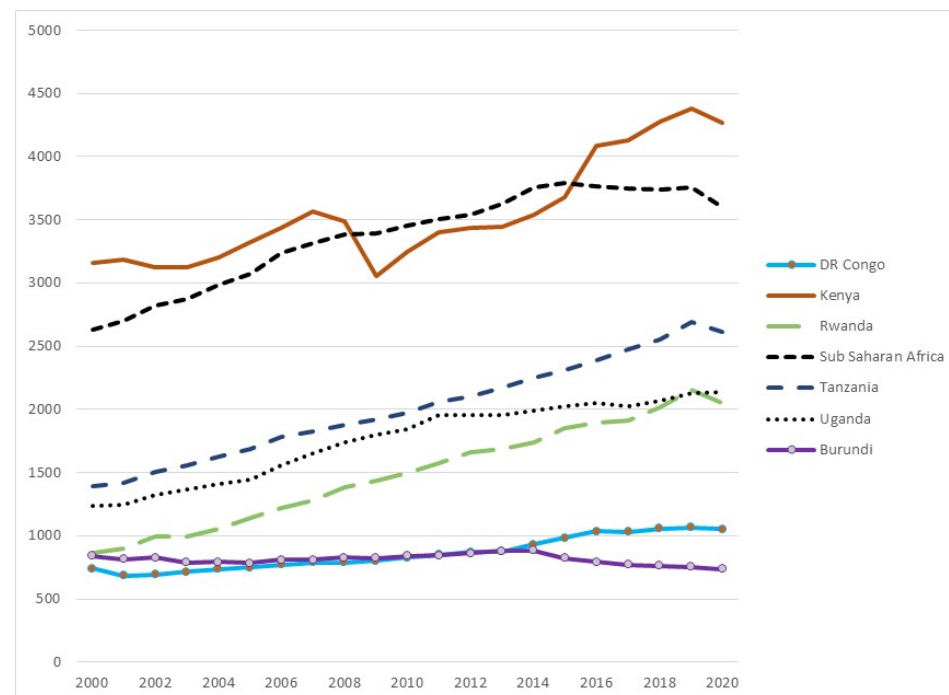
# From EAC-6 to EAC 7

## Potentials and pitfalls of the enlargement of the East African Community

### 1 Introduction

East Africa as a region is increasingly attracting attention, especially in view of its significant achievements since the turn of the Millennium. Figure 1 illustrates these steady improvements in the level of development in terms of Gross National Income (GNI) for the African Great Lakes region, where (with the clear exception of Burundi) the standard of living markedly improved. In particular, the outperformance of the average for sub-Saharan Africa (SSA) is noteworthy.

**FIGURE 1**  
**Gross National Income per head of population, purchasing power parity, constant 2017 international dollars, 3 year centred moving average 2000-2019**



Source: World Bank, World Development Indicators, accessed April 1, 2022.

Based on these developments, reclassification into ‘higher’ income groups are to be expected, such as indeed occurred for Kenya in 2014, and in 2020 when the World Bank upgraded Tanzania to the status of lower middle-income country.<sup>1</sup> The reclassifications, first of all, are achievements and will enhance

<sup>1</sup> Although National Accounts revisions also played a role, the achievement mainly reflected Tanzania’s economic track record of on average a bit more than six percent real growth of Gross Domestic Product over the past decade. See also Fialho and van Bergeijk 2017 on World Bank country classifications.

Kenya's and Tanzania's country profiles. This is an asset for attracting Foreign Direct Investment (FDI) and will also add further strength to the key productive sectors with considerable trade potential. The upgrade from lower to middle income country will, however, have an impact on concessional finance as well, because donor countries may prioritize other countries for their Official Development Assistance (ODA) and the World Bank uses income per head as one of the variables that inform its decision on whether or not a country is eligible for World Bank IDA zero to low-interest credits and grants. In the longer-term access to concessional finance will thus decrease, but this change will not occur overnight as shown by the experience of the 35 low-income countries that upgraded from low to middle income status over the past 15 years (Engen and Prizzon, 2019). Typically, there is a window of some five to six years in which new middle-income countries have a 'blended' status. The challenge is to use this period wisely and for a financial and economic strategy to be formulated to facilitate the change from concessional lending to financing at market conditions. An important element in such a strategy is to also look beyond borrowing because the financial requirements can be reduced by an improvement in the trade balance. This motivates our choice to investigate the EAC-7 trade potential in more detail. Following this Introduction, Section 2 discusses the stylized facts of applied gravity analysis in SSA. Next, we discuss challenges and opportunities related to the recent enlargement of the EAC by the inclusion of the Democratic Republic of Congo (DRC) on March 29, 2022. Section 4 gives a gravity modelling with findings sub-Saharan economic integration. The final section provides concluding remarks.

## **2 Some stylized facts of the applied gravity literature on East Africa**

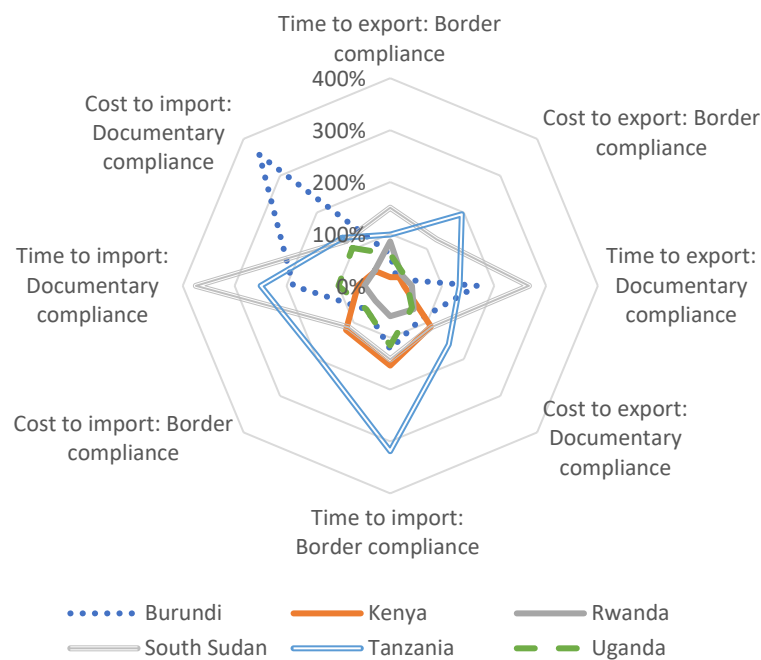
The analysis of regional economic integration initiatives is building on earlier literature in particular regarding the mother of all integration schemes: the European Union. From the early stages of economic integration initiatives, the focus has been not simply on reducing border taxes but on streamlining intra-trade-flows by creating common institutions, common requirements and reducing red tape. It is well known that the benefits of regional integration emerge due to a reduction of intra-trade barriers, but also that significant border effects continue to be observed in internal markets. Border effects are highly significant, both in federations (such as the US or Germany) and internal markets such as the EU and also in regional economic integration areas. Reducing those barriers enhances cross-border competition that in itself is a key driver of productivity increases and thereby of long run growth (van Bergeijk and Haffner, 1996). Enhanced productivity in its turn is associated with a stronger international competitive position in world markets.

It is not always straight-forward to relate the enhanced openness of regional trade initiatives to economic growth (e.g., Oloyede et al., 2021), perhaps due to sector specificity of market distortions that can, moreover, be difficult to observe. Therefore, we opt in this working paper for a more modest approach. We will focus on a necessary condition (the potential trade impact of a specific

aspect of economic integration) rather than a sufficient condition (the productivity impact of market integration), also because the latter requires a general equilibrium approach while for the former a partial equilibrium approach can be used. This *inter alia* implies that our findings are more relevant for the short to medium term than for the long run when general equilibrium effects play out.<sup>2</sup> A benefit of our approach, however, is that our findings can be compared to recent studies that predominantly use an applied gravity approach that has developed into the standard tool for trade policy analysis regarding African integration initiatives (e.g., Dube, 2021; Ejones et al., 2021; Kassa and Pegdewende, 2021; Leyaro, 2021; Agarwal et al., 2022).

The stylized facts of applied gravity analysis are that regional integration has comparatively speaking progressed well in the EAC, that trade creation by far outweighs trade diversion and that EAC is the most advanced in terms of tariff liberalization. Given this existing body of knowledge we focus on a relatively under-researched area where important differences exist between EAC member states, namely: the trade impact of the time and costs that firms incur when they comply with documentary requirements and border procedures (see Figure 2).

**FIGURE 2**  
**Radar diagram of the costs (time) to cross borders (exports and imports) in percent of Sub-Saharan average (2020)**



Source: World Bank Ease of doing business dataset accessed March 29, 2022.

<sup>2</sup> See Fofack et al. (2021). Note that the general equilibrium effects reported are quite small: the production growth effect is 0.1% in their static model and 0.3% in their dynamic model.

Figure 2 identifies Kenya as the best performing country, as firms need less than 24 hours to prepare the required documentation and to cross borders (for exporting products). In terms of cost, Rwanda (documentary compliance) and Burundi (border compliance) are the leading countries among EAC. South Sudan currently is the worst performing country in terms of the number of hours required for documentary and border compliances. The cost required to clear documents to export products from Tanzania is the highest among the EAC countries, that is: it reaches as high as US \$275. In contrast, in Rwanda and Uganda getting the required documents for exports is cheaper than in any other EAC member country (only at about US\$100). In particular, Tanzanian exporters carry the highest burden of costs associated with border compliances for custom clearances and inspection procedures conducted by several regulatory agencies.

As will become clear this is an important bottleneck for intra EAC trade, both EAC-6 and EAC-7. The costs in this case refer to both fees and a monetary valuation of the working time involved. The time of compliance is a more readily observed variable and measures the actual time that compliance takes. The time dimension is important for perishable goods, when international value chain activities are characterized by just in time delivery and also because delays at the border hampers working capital which necessitates increased financing requirements and cost of capital. Reducing time and costs for crossing borders is an important issue within the EAC as streamlining procedures, one stop portals, reducing handling time, as well as the use of common standards that facilitate EAC internal trade flows do not require large financial investments but do have a high payoff. Before investigating this impact, we first deal with the recent enlargement and its potential and pitfalls.

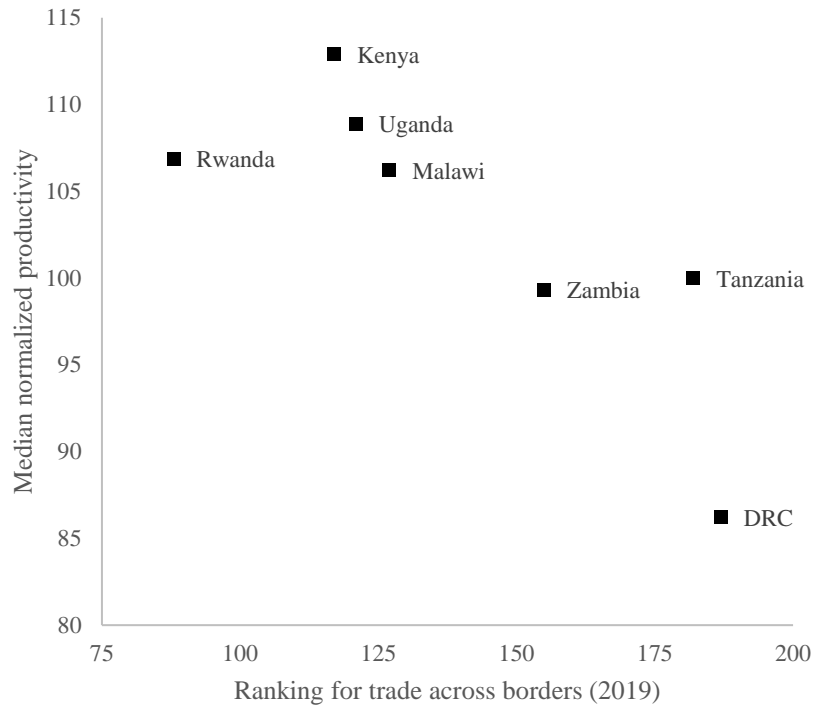
### **3 From EAC-6 to EAC-7**

The enlargement of the EAC brings both opportunities and challenges (Mmari et al., 2022). Firstly, access to the Atlantic Ocean (especially relevant for the landlocked EAC members) and a significant increase of the EAC market are both undoubtedly of strategic importance for the development of the region. Clearly, however, market integration and cross continental transportation will require major investments in infrastructure as well as a reduction of Non-Tariff Barriers (NTBs), including a streamlining of border procedures and also of security and political barriers to trade, in particular a reduction of armed conflict and lawlessness. Moreover, security issues play havoc both internally and at the external borders of the EAC-7. The EAC Treaty rightly stresses the necessity of peace and security for fostering a thriving environment for integration.

Secondly, the recent EAC enlargement involves countries with significantly different levels of per capita income (Figure 1) and adjustment of international specialization patterns thus can be expected to create winners and losers, both within countries and across countries. Obviously, such problems are not unique for African integration. A similar trade-off for example occurred by the enlargement of the European Union after the fall of the Iron Curtain in 1990.



**FIGURE 3**  
**Firm level productivity and ease of trade across borders in the EAC and selected neighbouring countries**

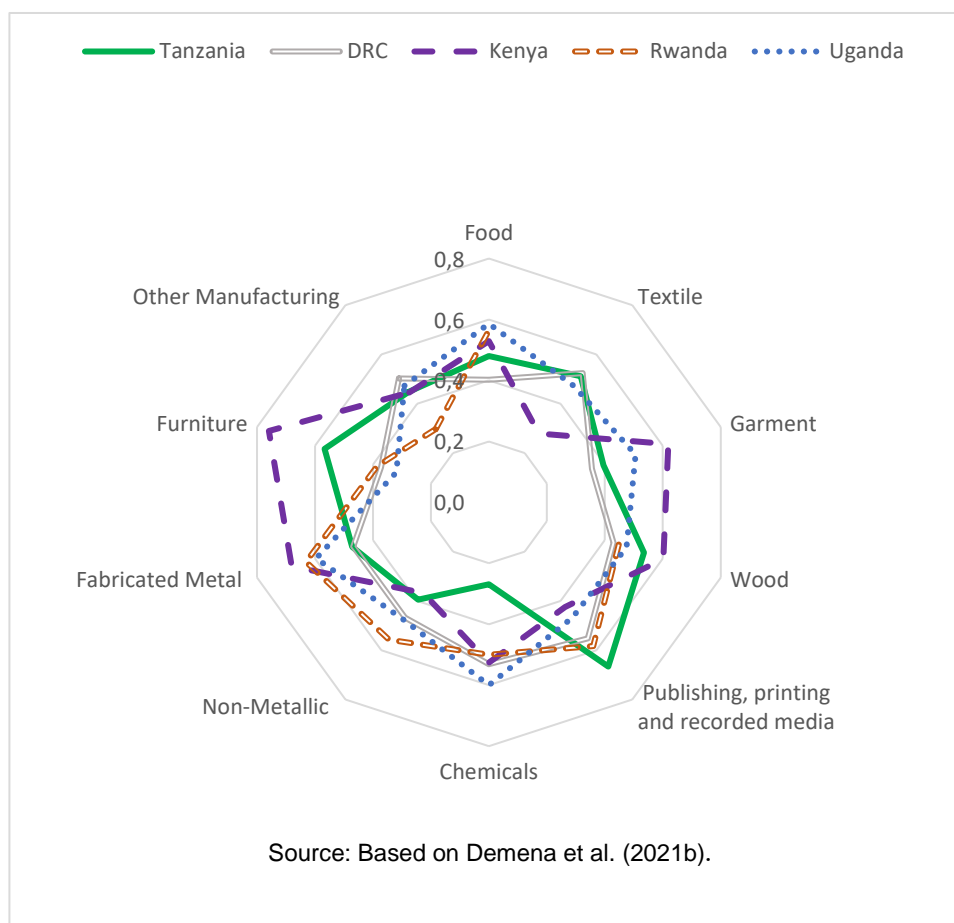


Note: It is important to note that due to data limitations Figure 3 provides a snapshot only and the snapshot is somewhat dated (2014 is the most recent year for which we have observations) and somewhat unsharp because we look at comprehensive aggregates that may hide underlying heterogeneity and because the sample size at the country level is relatively small. Therefore, the implication needs to be interpreted with caution and cannot be used to set policy priorities without a detailed evaluation of current conditions on the ground, Figure 4 of Demena et al. (2021a).

Source: Demena et al. (2021a)

Originally, many economists doubted the validity of integrating Eastern Europe in the EU, but that scepticism was based on *absolute* cost differences and thus neglected the potential for international specialization based on *comparative* advantage as well as the importance of non-traditional exports (Oldersma and van Bergeijk 1992). Deepening international integration is a key policy area, also because EAC-7 is characterized by significant heterogeneity with regard to productivity levels and the ease of cross border economic activity (Figure 3). The bottom line is that differences in productivity levels between and within countries may give rise to competitive and comparative advantage and mutually beneficial trade. Figure 4, therefore, compares the productivity of the countries and their industries. The further away from the origin the higher the normalized productivity level. For example, for garments and furniture, we see that firm-level productivity in Kenya is higher than in Tanzania, DRC, Uganda, and Rwanda. Rwandan for non-metallic manufactured products outperforms other EAC countries. In the same vein Uganda has higher productivity for chemicals and DRC for textiles.

**FIGURE 4**  
**Normalized productivity levels by product and country**



With respect to Figure 4, two robust and important conclusions appear. First, the radar diagram presents on the basis of comparative and competitive advantage that beneficial international specialization is possible when these countries get more integrated economically since the different patterns of strong and weak sectors. Second, from stronger international competition, for all countries there are winners and losers. Still, the clear message is that not all sectors can benefit if (not tariff) barriers to international trade are reduced.

#### **4 A gravity model with findings for sub-Saharan economic integration**

Our sample includes all the countries that are members of EAC, SADC and COMESA. To this sample we add the major trading partners of EAC. This

sample covers 80 countries.<sup>3</sup> We analyse bilateral trade between these countries with a standard gravity model.

## 4.1 Data

In order to estimate time and costs for documentary and border compliances that have trade-reducing impacts, we use various data sources. Our main variables of interests are survey responses regarding documentary and border compliance that will be used both in terms of time spent and cost associated with the requirements and regulations involved by all agencies for the overall process of importing, exporting or reexporting of goods and services. According to the World Bank, documentary compliance captures the time and cost associated with compliance to get, prepare, process, and submit documents during importing or ex-ported. Similarly, border compliance provides the time and cost associated with the economy's customs clearance, border inspection and port handling conducted by all government agencies involved in the importing and exporting activities.

Apart from an important aspect of international trade in terms of time and cost for documentary and border compliances for exporting and importing, we also included a set of monadic and dyadic control variables. Regarding monadic variables, these include GDP and population for the exporting and importing countries.

In terms of dyadic variables, and also as additional variables of interest, we have included binary dummy variables that indicate co-membership in a regional economic blocs associated with EAC. The dummy variables identify those SSA countries that are considered as EAC's major trading partners that are part of the Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC). This set of dummies enables us to disentangle the impact of three of Africa's major intra-regional trading blocs, COMESA, EAC and SADC, thereby allowing the analysis of the tripartite free trade area (TFTA). In addition, we have also included a dummy for intra EU trade.

For all dummy variables, the control group is a pair of countries that do not share any membership in one of the large regional economic blocks in our data set. To construct our dependent variable, we use data for bi-lateral trade (exports and imports) extracted from International Monetary Fund's (IMF's) Direction of Trade Statistics Database. Data on GDP and population were obtained from World Bank development indicators database.

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<sup>3</sup> These countries are Algeria, Angola, Australia, Austria, Belgium, Benin, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central Africa Republic, Chad, China mainland, China Hong-Kong, Comoros, Congo, Dem. Rep., Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Egypt, Estonia, Eswatini, Ethiopia, Finland, France, Germany, Ghana, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mauritius, Mozambique, Namibia, Netherlands, Niger, Nigeria, Oman, Poland, Portugal, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Seychelles, Slovak Republic, Slovenia, South Africa, South Sudan, Spain, Sudan, Sweden, Switzerland, Tanzania, Tunisia, Turkey, Uganda, United Arab Emirates, United Kingdom, United States, Vietnam, Zambia, Zimbabwe.

## 4.2 Estimation

We now proceed to build the empirical framework based on the gravity model. The gravity model is a well-established framework to study the effects of various determinants of international trade flows (van Bergeijk and Brakman, 2009). This empirical gravity model has been used routinely in the trade literature hypothesizes that bilateral trade is determined by exporter GDP (supply potential), importer GDP (market demand potential) and a set of variables representing trade facilitation and/or trade resistances (Afesorgbor, 2019). Using regression analysis, the role of time to export and import, and cost to import and export are included as determinants of trade flow in facilitating or hindering bilateral trade. In this regard, documentary and border requirements are coded in terms of the respective time and costs associated with compliance and are considered as indicator variables relevant to trade facilitation to export and import for analysing the determinants of trade flow. Thus, the specification of the baseline econometric gravity equation will be as follows:

$$X_{ijt} = \alpha_0 + \alpha_{it} + \alpha_{jt} + \alpha_t + \beta_1 M_{it} + \beta_2 M_{jt} + \beta_3 D_{ijt} + \beta_4 \ln \text{TimDoc}_{it} + \beta_5 \ln \text{TimBord}_{it} + \beta_6 \ln \text{CostDoc}_{it} + \beta_7 \ln \text{CostBord}_{it} + \varepsilon_{ijt} \quad (1)$$

The term  $X_{ijt}$  is our dependent variable measuring the two-way (both exports and imports) trade flow between a country  $i$  and a country  $j$  at time  $t$ .  $\alpha_0$  is a constant term with a structural interpretation as world output. The variable  $\alpha_{i(j)t}$  encompasses directional time-varying (exporter and importer) fixed-effects. According to Anderson and van Wincoop (2003), the inclusion of the exporter-time and importer-time fixed-effects for each exporter and importer respectively, enables consideration of multilateral resistances as well as for any other potential observable and unobservable factors that vary over time that may influence trade flows (also see, Baier and Bergstrand, 2007; Olivero and Yotov, 2012). In principle, therefore,  $\alpha_{i(j)t}$  may control for any observable and unobservable time-varying covariates. The variables  $M_{i(j)t}$  are monadic factors that may affect bilateral trade for the exporter (importer) that include GDP and population at a time  $t$ . In contrast to these monadic variables,  $D_{ijt}$  dyadic factors of trade flow determinants such as capturing the presence of international borders, regional trading memberships between countries  $i$  and  $j$  for each year  $t$ . For the latter, we considered dummy variables that is equal to 1 if both exporter and importer are member of EAC, COMESA, SADC, or EU at a time  $t$  and zero otherwise.

The main variables of interest are indicators from the World Bank's Doing Business database and contain information regarding the time and costs to export and import as a result of border compliance and documentary requirement ( $\beta_4$  to  $\beta_7$ ). Given the empirical framework, we addressed several econometric concerns. The first is that our variables of interest are a form of non-discriminatory trade policy. That means, a documentary requirement or border processing time/cost in the exporting country  $i$  is the same regardless of the importing country  $j$  for a given year  $t$ . In this case, any unilateral policy in an exporting country is absorbed by the exporter-time fixed effects regardless of

the importing country at time  $t$ , indicating the gravity equation cannot estimate the impact of our variable of interest. This is because, any covariate that only varies at the  $it$  or  $jt$ -dimension is absorbed by the exporter or importer time-varying fixed-effects. Following best practices, we model the structural gravity equation with intra-national and international trade flows to obtain an estimate of the trade effect of documentary requirements and border-processing time/cost (Yotov et al., 2016).

The way we address this issue is to assume that there is no border processing time for trade within a country – that is: for intra-national trade. This allows to interact the border processing or documentary compliance time/cost variables with a dummy variable indicating that the trade flow is international rather than intra-national. In this case, our variable of interest (the interaction term), does have variation in the  $ijt$ -dimension, as it compares border processing time for international vs. intra-national trade flows (i.e., dependent on the exporter). As it is an interaction, we will not estimate the ‘base-effect’ of documentary and border-processing time/cost, but instead the difference between border-processing time for international and intra-national trade flows. Hence the assumption that there is no border-processing time for intra-national trade flows is crucial, so that we can interpret the interacted coefficients  $\beta_4$  to  $\beta_7$  as the effect of documentary and border processing time/cost in general.<sup>4</sup>

Another econometric concern is that trade data are known to be plagued by heteroscedasticity (Yotov et al., 2016). One way to address this issue in the gravity equation is to transform the term  $X_{ijt}$  (our dependent variable) into size-adjusted trade. According to Anderson and van Wincoop (2003), this adjustment of the dependent variable can be captured by the ratio of the trade flow to the supply potential (exporter GDP), and market demand potential (importer GDP), that is the product of the sizes of the two (exporter and importer) GDPs.<sup>5</sup> Moreover, since we are specifically interested in the EAC, we further distinguish between the world average border processing and documentary compliance time/cost effect and the EAC average effect.

One more empirical concern is the presence of zero trade flows. Traditionally, the gravity equation is estimated with the logarithm of international trade flows from exporter  $i$  to importer  $j$  at time  $t$  with an OLS or other estimation of the empirical specification. A well-known drawback of the log-linearized approach is that it cannot consider the information contained in the zero trade flows (Afesorgbor and van Bergeijk, 2014). In our case, 11% of the trade flows has zero values which means if they are transformed into logarithmic, these observations will be simply omitted/dropped. Instead of omitting zero flows, other strategies in the literature are to use the Tobit estimator or replacing them with small arbitrary values (known as the zero plus

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<sup>4</sup> The document compliance and border processing time and cost variables are interacted with the dummy variable included in the  $D_{ijt}$  (dyadic factors), which is equal to one for *international* trade and zero for *intra-national* trade, to capture the fact that this type of policy apply only to international trade so as to give the variation at  $ijt$ -dimension, whose variable is different from  $it$  (exporter time-varying dimension) or  $jt$  (importer-time varying dimension).

<sup>5</sup> The intuition behind this transformation is that the variance term  $\varepsilon_{ijt}$  (error) is proportional to the supply potential and market demand potential for exporter and importer respectively (Yotov et al., 2016).

one). However, all these strategies are known to produce inconsistent estimated parameters and thus labelled as infeasible (Yotov et al., 2016; Afesorgbor, 2017). To address the presence of zero trade flows, the most convenient solution advocated by Santos Silva and Tenreyro (2006) is to estimate the gravity equation in multiplicative form rather than logarithmic transformation. This approach applies the Poisson Pseudo Maximum Likelihood (PPML) estimator to estimate the gravity model, which is also put forward as consistent in the presence of heteroskedasticity and well behaved in particular when the dataset contains large zero flows (Martínez-Zarzoso, 2013). Moreover, simulations of trade flows show that the PPML estimator is the most convenient strategy in the presence of zero flows than any other approaches (Head and Mayer, 2014).

### 4.3 Findings

All estimates are obtained by allowing that the “direct/partial equilibrium” effect of the border processing time (in terms of documentary and border compliance) for *EAC* is *different* from the world’s average border processing effect. All columns use the PPML estimator. We follow recent studies in the literature (e.g., Olivero and Yotov, 2012; Yotov et al., 2016), and estimate the gravity models with a panel dataset using the period 2015 to 2018. This is also important as responses to trade policy changes will need some time to materialize, and thus will not be instantaneous.

#### *Impact of time to cross borders*

Table 1 reports the effect on exports. Columns 1 and 2 use data on either time for documentary compliance or border compliance, respectively. Results in both columns differ considerably in sign and are also not significant. Column 3 adds both measures and produced an estimate with expected sign and of sufficient significance, thus indicating that the results in columns 1 and 2 suffer from omitted variable bias. Our interpretation therefore focuses on coefficients associated with estimation of our preferred model (column 3). Finally, Column 4 by way of robustness check additionally estimates the combined (interacted) effect of documentary and border compliance; the results are insignificant. Robustness analyses for the monetized costs of border procedures and compliance and also for imports give similar results.<sup>6</sup>

Focusing on column 3, the time for documentary compliance for the EAC is a significant trade barrier and has coefficient of -1.271 implying that a 10% decrease in the time needed for documentary compliance is associated with a 13% increase in exports of EAC countries during the period of investigation. In terms of the time required for border compliance, the effect on export is substantially lower (-0.497) as compared to documentary compliance. That is: exports can be enhanced on average by about 5% if there would be a 10% reduction on the current time spent for border processing.

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<sup>6</sup> Results are available from the authors upon request.

**Table 1**  
**The effect of time for Documentary and Border compliance on exports**

| <b>Variables</b>                           | <b>(1)</b>          | <b>(2)</b>          | <b>(3)</b>           | <b>(4)</b>          |
|--|---------------------|---------------------|----------------------|---------------------|
| Time-Documentary - Rest of the World (RoW) | 0.089<br>(0.370)    |                     | 0.091<br>(0.346)     |                     |
| Time-Documentary - EAC                     | 0.365<br>(0.387)    |                     | -1.271**<br>(0.572)  |                     |
| Time-Border - RoW                          |                     | -0.148<br>(0.209)   | -0.962***<br>(0.353) |                     |
| Time-Border - EAC                          |                     | -0.006<br>(0.173)   | -0.497***<br>(0.112) |                     |
| Time- Documentary-Border - RoW             |                     |                     |                      | 0.173<br>(0.715)    |
| Time- Documentary -Border-EAC              |                     |                     |                      | 0.394<br>(0.720)    |
| Both_EAC                                   | 4.802***<br>(0.316) | 4.766***<br>(0.338) | 4.766***<br>(0.338)  | 4.802***<br>(0.316) |
| Both_SADC                                  | 3.396***<br>(0.314) | 3.442***<br>(0.323) | 3.442***<br>(0.323)  | 3.396***<br>(0.314) |
| Both_COMESA                                | 2.099***<br>(0.270) | 2.207***<br>(0.470) | 2.207***<br>(0.470)  | 2.099***<br>(0.270) |
| Both_EU                                    | 2.109***<br>(0.136) | 1.859***<br>(0.188) | 1.859***<br>(0.188)  | 2.109***<br>(0.136) |
| Constant term                              | 3.842*<br>(2.330)   | 5.762***<br>(1.083) | 9.941***<br>(1.090)  | 3.470<br>(4.338)    |
| N  | 11444               | 9092                | 9092                 | 11444               |
| <b>R<sup>2</sup></b>                       | 0.661               | 0.663               | 0.663                | 0.661               |

*Notes:* Clustered robust standard errors by country-pairs are in parentheses. \*  $p < 0.10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . All estimates are obtained through allowing the “direct/partial equilibrium” effect of the border processing time (in terms of documentary and border compliance) for *EAC is different* to the average border processing effect of the world. These estimates are elasticities. The dependent variable is the size-adjusted exports. All estimates use time, export-time, and import-time fixed effects; however, these fixed effects are not included in the table for brevity. All columns use the PPML estimator. Columns 1 and 2 use data on time for documentary and border compliance respectively; Column 3 adds both these different time requirements in the same regression; and finally, Columns 4 estimates the combined effect of documentary and border compliance.

Table 2 gives even stronger effects regarding the monetized costs of documentary and border compliances. Again, focusing on column 3, our variables of interest are significant and have a priori expected sign. The cost of required documents compliance to export is significant and has a magnitude of -4.402 (a 10% decrease in cost for documentary compliance would increase exports of EAC countries on average by 44%). Similarly, a 10% reduction of EAC border processing costs would increase potential export of EAC countries on average by 35% associated with.

To put our results in to perspective, for instance for the monetized costs of border procedures and compliance (Table 2), the world average size effect regarding cost to export for border processing is about -0.401 only, which means a 10% removal of this cost would increase exports by 4%. Comparatively, EAC countries have to bear about 31 percentage points more costs to export due to border processing. EAC exporters carry the burden of costs associated with border compliances for custom clearances and inspection procedures conducted by several regulatory agencies. Reducing time and costs for crossing borders is therefore still an important issue within the EAC. This is mainly because

streamlining procedures and one stop portals would reduce handling time. At the same time, the use of common standards that facilitate EAC internal trade flows do not require large financial investments but do have a high payoff.

**Table 2**  
**The effect of cost for Documentary and Border compliance on exports**

| Variables                       | (1)                 | (2)                 | (3)                  | (4)                 |
|---------------------------------|---------------------|---------------------|----------------------|---------------------|
| Cost- Documentary - RoW         | 0.055<br>(0.096)    |                     | -1.572***<br>(0.243) |                     |
| Cost- Documentary - EAC         | 0.138<br>(0.114)    |                     | -4.402***<br>(0.695) |                     |
| Cost-Border - RoW               |                     | -0.099<br>(0.154)   | -0.401**<br>(0.188)  |                     |
| Cost-Border - EAC               |                     | -0.001<br>(0.138)   | -3.494***<br>(0.653) |                     |
| Cost- Documentary -Border - RoW |                     |                     |                      | 0.026<br>(0.044)    |
| Cost- Documentary -Border - EAC |                     |                     |                      | 0.074<br>(0.054)    |
| Both_EAC                        | 4.766***<br>(0.338) | 4.726***<br>(0.334) | 4.726***<br>(0.334)  | 4.726***<br>(0.334) |
| Both_SADC                       | 3.442***<br>(0.323) | 3.395***<br>(0.325) | 3.395***<br>(0.325)  | 3.395***<br>(0.325) |
| Both_COMESA                     | 2.207***<br>(0.470) | 2.189***<br>(0.468) | 2.189***<br>(0.468)  | 2.189***<br>(0.468) |
| Both_EU                         | 1.856***<br>(0.189) | 1.799***<br>(0.183) | 1.799***<br>(0.183)  | 1.799***<br>(0.183) |
| Constant term                   | 5.526***<br>(1.180) | 6.542***<br>(1.642) | 12.346***<br>(1.305) | 5.524***<br>(1.179) |
| N                               | 8944                | 8787                | 8787                 | 8787                |
| $\bar{R}^2$                     | 0.663               | 0.698               | 0.698                | 0.698               |

Notes: See Table 1.

### ***Regional economic integration***

Moreover, the results shed light on three important regional economic integration areas or communities in Africa, namely EAC, SADC, and COMESA. The estimates for trade partners in each of these blocks differ substantially in size but consistently have expected signs, implying that these regional economic blocs have a significantly positive impact on intra-area trade flows, but that the size of the effects considerably differs. In particular, the regional economic blocs impact associated with EAC and SADC have a significantly stronger economic impact. These results are consistent with Kassa and Pegdewende (2021), who point out the drivers of these results as density of economic activity, investment in trade facilitation as well as improved quality and quantity of regional infrastructure – in particular as compared to COMESA and other African intra-regional economic blocs. Other studies that are consistent with our findings include Carrere (2006), Coulibaly (2009), and Leyaro (2021). The findings reported by Ejones et al. (2021) agree in terms of positive and significant impact but disagree on the size effect as they estimate that COMESA has generated substantially larger intra-regional bilateral trade flows than the trade for EAC



partner countries. Overall, the results of the three regional economic blocs are in line with the central point of creating regional integration of trade as a mechanism to enhance the capacity of local supply so as to further engage in global trade to improve market access. Our findings seemingly contradict Candau et al. (2019), who analyse the effects of regional trade agreements (RTAs) on bilateral trade in Africa and report that there is no trade creation coming from RTAs in the years 1990 – 2014. Candau et al. (2019) argue that the bulk of trade creation occurred between 1955 and 1990, indicating that most gains of these RTAs have been exhausted. Earlier Longo and Sekkat (2004) for the period 1988-1997 reported in the same vein that regional trade integrations or agreements were not associated with generating trade between member countries.

This paradox in the literature may reflect that the “old design” of African RTAs does not work anymore, but that “new approaches” such as currently underway in the EAC or the COMESA-EAC-SADC Tripartite free trade area do hold significant promise, provided regional integration deepens sufficiently. Our finding for the EAC membership is consistent with the recent study Riedel and Slany (2019) who explore the bilateral imports within the COMESA-EAC-SADC Tripartite countries against a control group of 27 other African economies for the period 1995 to 2010. Riedel and Slany (2019) report a positive but insignificant relationship for the COMESA and SADC urging them to cautiously doubt the trade-promoting effect of the TFTA formed in 2011. Exploring the recent time dimension of the panel dataset, our study consistently suggests a much more optimistic view of the potential effectiveness of the COMESA-EAC-SADC TFTA. This is in line with Afesorgbor and van Bergeijk (2014) investigating a sample of 25 countries for the years 1980 to 2006 regarding multi-membership and report for ECOWAS and SADC that competing membership hampers trade agreements effectiveness. The later enables them to infer that the TFTA could resolve this. Moreover, comparing five major African intra-regional trading areas for 1980 to 2006, Afesorgbor (2017) finds that SADC is trade-promoting, but that COMESA membership is not significantly influencing trade. All in all, our findings consistently highlight the potential of enhancing the regional trading blocs in particular for the EAC and SADC because of their strong trade effects.

## **5 Concluding remarks**

Our findings illustrate the very importance of border procedures for EAC countries. Significant costs and time are involved in documentary compliance and border procedures of exporting and importing thus creating important efficiency losses. Better management of transportation hubs such as (air)ports and border posts, reducing the costs and time of handling, as well as an efficient organization of documentary compliance (streamlining procedures, one stop portals, and the development and use of common quality standards) are therefore important for EAC countries but to a differing degree and along different dimensions. There is ample scope especially for Tanzania, South Sudan and to some extent Burundi to adjust towards Kenya’s best practice. Looking

beyond EAC some room for improvement would appear to exist also for Kenya because its time to import exceeds the sub Saharan average. Such improvements, moreover, are not only directly beneficial for EAC countries that are moving towards that standard. Focusing on EAC movements towards best practice, moreover, will also benefit the best performing EAC country (Kenya), because a specific trade bottleneck is just as important for an exporting as an importing country. If Tanzania, for example, reduces its time to import via the Port of Dar es Salaam, that will also help Kenyan exporters to Tanzania. This is actually a major lesson for further regional integration in the EAC: trade inefficiencies in one-member country have important spill-over effects for other members.

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