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# **The prospect of the proposed Currency Union on intra-regional trade in East African Community**

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11 April 2020

Online at <https://mpra.ub.uni-muenchen.de/100512/>  
MPRA Paper No. 100512, posted 21 May 2020 09:11 UTC

## The prospect of the proposed Currency Union on intra-regional trade in East African Community

### Abstract

Currency union *with a common policy* is welfare superlative to the use of sovereign currencies even if a member of the East African Community uses a convertible currency. In this background, the study evaluates whether adopting a common currency will lead to trade using an augmented gravity model of international trade. Additionally, the study investigates the effect of tariffs and nontariff on trade in EAC. The results show that adopting a common currency will lead to trade. Also, the study showed that trade will be enhanced by six-folds when tariffs and nontariff is eliminated. The study concludes that a currency union *with a common policy* could serve as a panacea when the appropriate institutional policy framework is adopted to ensure transparency by reducing trade and non-trade barriers.

Keywords: Currency union, Sovereign currencies, tariff, nontariff, gravity model of international trade, panacea, Optimal Currency Area, intra-regional trade

## INTRODUCTION

The treaty of June 1976 formalized the East Africa Community (EAC) as a customs union comprising Kenya, Uganda and Tanganyika, present-day Tanzania. Under colonial rule, the East African currency board issued a single currency by practicing the Sterling Exchange rate regime until countries gained independence and separately established central banks due to limited discretion of monetary policy in 1967 ( Masson & Pattillo, 2004). However, the EAC collapsed in 1977 due to alleged skewed benefits to Kenya attributed to relatively greater industrialization than the other members (Musonda et al, 1997). This led to the signed Permanent Tripartite Commission for East African Co-operation in November 1993 which was launched in 1996 and paved way for the treaty of 30<sup>th</sup> November 1999 to cement East African Community (EAC) as the official name and revived on 7 July 2000. To facilitate the firm implementation of objectives seven institutions were established. Articles 5, 8 and 13 of the treaty stipulated the objectives of the community with greater emphasizes laid on developing policies and programs to widen and deepen co-operation in diverse ways and laid the long term plan of the community in attaining a political union by harmonizing macroeconomic policies and removal of all barriers to trade.

The Protocol on the Establishment of the East African Community Customs union was signed on 2 March 2004 as a stepping stone towards achieving the long term perspective of a political union which was commenced on 1 January 2005. This led to the implementation of a Common External Tariff (CET), elimination of customs duty, scrapped off charges of equivalent effect on imports and set the tone to eliminate all tariffs by 2010. The Customs Union aimed to liberalize intra-EAC trade and promote efficiency in production through facilitating the free movement of goods within the community. The Republic of Burundi and Rwanda acceded to the EAC treaty on 18<sup>th</sup> June 2007 and officially joined in 2009. To facilitate the establishment of a currency union by 2012 led to the set out nominal convergence criteria to reduce asymmetry of shocks among members. However, countries inability to attain the laid down criteria was attributed to infrastructural deficits (Kishore & Ssozi, 2011). Given this, the EAC trade Negotiation Act was brought to bear in the year 2008 which was led by a Joint Trade Negotiations Commission. Also, the Common Market Protocol was signed in November 2009 and implemented in July 2010, to facilitate the free movements of capital, goods, persons, and services (WTO, 2012). The Customs Management Act of 2004 was amended and implemented in 2012.

The Protocol on East African Monetary Union was signed by Kenya, Uganda, Tanzania, Rwanda and the Republic of Burundi in November 2013, igniting the desire to establish a currency union by 2024. It spilled out the processes including macroeconomic convergence criteria, legal and institutional framework for the establishment by 2024 of a single currency. In this background, the pinpointed coverage on harmonization of policies include fiscal policy coordination and harmonization, monetary and exchange rate policy harmonization, statistic harmonization, banking supervision, and financial stability, harmonization of payments financial market coordination, and settlement systems, and cohesive accounting and financial standards. EAC also decided to establish the East African Monetary Institute and the East African Central Bank to fulfill these goals. Also, the Competition Act was implemented after its amendment in 2009 and the Trade Negotiation Bill was drafted in 2014. Also, the East African Payments System (EAPS) was launched to allow members to transact using all sovereign currencies in March 2014 even though the prevalence of some transaction costs. The Protocol on the Monetary Union was ratified by all five partner states in early 2015. As a result of the efforts, South Sudan filed to join the community in March 2016 and became a member in April 2016. The EAC Elimination of Non-Tariff Barriers Act was implemented in 2017. All members of EAC are eligible members of the World Trade Organization except for South Sudan. Additionally, the community has an international Free Trade Area (FTA) Agreements notably Europe and the United States. Also, the EAC is an eligible beneficiary of the African Continental Free Trade Area (AfCFTA) Agreement, touted as the World largest Free Trade Area, aimed to create a common market for goods, resources, and services to facilitate investment, healthy competitiveness and resolve overlapping memberships to promote socio-economic stability under Article 3 of the treaty outlined to begin on 1 July 2020.

Despite the rattling effort of EAC, the level of trade remained robust, below 23 % of total trade (UNCTAD database, 2018). Rose (2000) argued that the use of sovereign currencies serves as a barrier to international trade therefore an exigency to integrate further to stimulate relatively greater trade flows. In this context, adopting a common currency eliminates exchange rate volatility and taxes among members to reduce transaction costs, therefore savings will increase hence investment. Also, empirical studies have shown currency union inures other benefits via other means to members such as political, cultural, tourism, foreign direct investment (FDI), Money market deepens and integrates among members, a platform to judge price differentials, investment certainty due to elimination of exchange rate volatility, portfolio diversification, a larger market for small-scale business to exploit to grow, discipline against inflation, competitive market, lower travel costs, better access to capital among others (Rose & Wincoop, 2001; Glick & Rose, 2002; Alesina & Barro, 2002 ).

The main advantage of developing countries in forming a currency union lies with the relatively smaller public sectors compared to the European Monetary Union, greater trade potential, ability to navigate through shocks easily, relatively large informal sector, poorly diversified economies hitherto the use of sovereign currencies. Contrarily, the main disadvantage of forming a currency union is the asymmetry of shocks. The shocks experienced by developing countries are highly attributed to lack of microeconomic and macroeconomic restraint, and the heavy dependence of the primary sector which is highly volatile and adversely causes the seasonality of reserves of countries. In this background, Currency union is a means of attenuating the adverse effect of monetary policy and ensuring economic diversification through a well-laid road map. Also, currency union in EAC can partly be stabilized against asymmetric shocks by providing credit facilities coupled with strict fiscal discipline by national fiscal authorities in line with deliberating democracy, foreign aid, and trade openness (Tapsoba, 2011, Sakyi, 2013). As trade increases, business cycles can in principle move either more asynchronously or more closely together to nullify shocks and converge (Rose, 2008; Ofori-Abebrese, 2006). To buttress, Ncube et al., (2014) argued that increased intra-regional trade will attenuate the effect of external shocks. Currency union was well documented as debt fueling due to the experience in EMU. Contrarily, the plight was attributed to public sectors been very large and social transfers of one form to another typically constitute a greater share of public expenditures, which are often funded by external debts. It is this large element of social insurance, along with the ability to borrow cheaply from the international markets in other to fund such expenditures. Also, the international financial crises were a major contagion in destabilizing EMU thereby worsening the economic stance of the peripherals. Undeniably, a currency union is best for countries that lack microeconomic and macroeconomic restraint. Therefore ensuring sound inflation rate, interest rate, government stability, reduced debt stock and an integrated financial market improves currency stance. Currently, countries in EAC are negotiating to make all currencies freely convertible with one another. However, the challenge faced emanates from less liquidity in the financial markets, relatively high unemployment, limited business opportunities and limited access to capital which could yield relatively greater exchange rate volatility, increased debt burden, affects exports hitherto balance of trade in EAC. Additionally, members are reluctant to make transactions in domestic currencies with preference to the US dollar (Central Bank of Kenya Annual report, 2018 cited by tralac).

The East African Community (EAC) is plagued with trade and non-trade barriers leading to the low level of trade in the sub-region (AfDB, 2018). In this background, intra-regional trade in EAC is consistently below 23% of total trade (UNCTAD database; 2018). The non-trade barriers consist of smuggling, bribery and corruption, inadequate trade and transport infrastructure, illegal trade practices, political interferences and wrangling, fake documentations, political instability, human trafficking, high illiteracy among small-scale business operators who uses informal channels to export their goods due to the ignorance of the policy on free movement of goods, poor business services such as banking, auditing, and insurance, embezzlement of national coffers, security-related issues, wrong invoicing, human rights violation among others. (Alusala, 2010; Balistreri et al., 2014; United Nations Office of Drugs and Crimes, 2016; East Africa Bribery Index, 2017; Transparency International, 2018; Kaminchia, 2019, AfDB, 2019). These non-trade barriers increase the cost of trading and culminate in the large informal sector. Other significant barriers to trade in EAC are nontariff, tariffs, import restrictions and export restrictions utilizing bans and quotas (Okumu, 2010; Mkuna, 2014; World Bank, 2014; ODI, 2016, 2017, AfDB, 2019). Currency union has proven to be a panacea for these ills in other regions.

The use of sovereign currencies limits the volume of trade within member states, therefore, serves as a barrier to trade in EAC. In this background, the currencies circulate at additional transaction costs that affect price stability and transparency hence adverse effect on investment stimulation. Thus, the relatively high demand for foreign currencies to trade with one another hitherto the costs of currency conversions. However, the convertibility of the Kenyan shilling has played a key role in facilitating trade due to the implementation of the EAC common market. On average, consumer price inflation for Kenya was 7.8%, Tanzania was 8.6%, Uganda was 7.7%, Rwanda was 5.8%, the Republic of Burundi was 9.4% and South Sudan was 80.1% using averaged data from 2009 to 2017 (WDI, 2018). The community is eluded of price transparency across member states. There is an exigency to stimulate intense trade within member states through healthy competition by forming a currency union *with a common policy*. Moreover, the relatively high dependence on the primary sector by EAC countries notably 80% of rural dwellers and contributes about 36% of GDP, has necessitated the need for diversification of the economies (UNCTAD database, 2018; AfDB, 2019). In this background, the danger of climatic change and population growth will dwindle economic gains from the sector. According to the Intergovernmental Panel on Climate Change (IPCC), GDP across Africa is expected to reduce by 2% - 4% by 2040 due to climatic change. This would represent a loss of about \$ 653 million to about \$1 billion in 2040 using exchange rates in 2018. In this background, necessitates the exigency for EAC countries to diversify their economies and initiate regional population control policies. Currency union *with a common policy* has proven to improve the economic stance of struggling economies through healthy competition and the practice of comparative advantage. Furthermore, the over-extraction of precious minerals will harm the long term growth due to the gains from agreements in percentage-wise and trade malpractices. The projected future will run these resources redundant to stimulate growth due to shortage. Currency union *with a common policy* is a means of mobilizing national resources to tackle major problems in the region. Theoretically, currency union is most suitable for relatively small countries.

## OBJECTIVES

- (i) To evaluate whether a common currency will lead to trade
- (ii) To investigate the impact of tariff and nontariff on trade

## SIGNIFICANCE OF THE STUDY

There are mixed results about currency union feasibility in East Africa Community (EAC). In this background, some empirical studies used several econometric dispensation to assess the possibility of currency notably the OCA criteria, structural VAR among others (Sheikh, 2014; Cárcel et al., 2014; Redda et al., 2017; Muthui et al., 2016; Preis & Rappe 2019). The results showed that countries do not form an OCA therefore currency union is not feasible. Contrarily, empirical studies using the OCA criteria showed the European Monetary Union was not an Optimal Currency Area, before the currency union (Komárek, 2002; Vrnáková & Bartušková, 2013). Despite the EMU, not an OCA, the currency union stimulated trade flows among member states (UNCTAD database, 2018). A recent evaluation of the EMU countries based on OCA criteria showed countries were converging with the introduction of the Euro (Rose, 2008; Füllrutter, 2012; Crowley 2013). Therefore the OCA criteria are redundant in its prowess to predict the trade volumes among proposed members. Also, some studies showed that currency union will be feasible due to an estimated long-run convergence (Mkenda, 2001; Kishor & Ssozi, 2009; Caporale et al. 2018; Gitimi, 2018). These existing studies focused on the compatibility of macroeconomic indicators among members failed to acknowledge the effect of a common currency on trade by reducing transaction costs and the significant effect of trade in nullifying shocks hitherto the adverse effect of sovereign currencies and high demand for foreign currencies to trade, unearthing the greater trade potential, ensuring convergence among members, and exposing the large informal sector. This study seeks to estimate the effect of a common currency on trade and investigate the impact of tariff and nontariff to unveil its quantitative effect on trade in EAC. The study adds up to existing knowledge on currency union by using an augmented gravity model of international trade in the estimation and acknowledging the other benefits currency union will inure to the community.

## 2.0 LITERATURE REVIEW

### Theoretical Literature

#### 2.1 The Theory of Optimal Currency Area

The Optimal Currency Area (OCA) theory can be credited to Mundell (1961) and McKinnon (1963) during the 1960s. The theory postulates that countries with high labour mobility, a high degree of openness, substantial product diversification, sufficient flexible price and wage, effective monetary policy, similar inflation rates and the zeal to abandon their currencies will benefit from forming a currency union. Mundell contends that a common currency reduces transaction costs leading to trade creation.

High factor mobility especially labour mobility among the countries was key in forming an OCA in a fixed exchange rate regime. McKinnon (1963) argued that the degree of openness as a relationship between tradable and non-tradable is crucial in forming an OCA.

The more economies are opened to one another, the higher the tendency of forming an optimal area. For a currency area to be optimal, Mundell (1961) argued that asymmetric shocks can be nullified with free labour mobility by liberalizing factor markets in the area. McKinnon (1963) argues an OCA as a region with a common currency and within which monetary policies, fiscal policies, and flexible exchange rates can address issues related to price stability, employment and international payment which are conflicting. He suggested the need for the economies to be well integrated to reduce the exchange rate effect. He investigated the consequence of the size of currency unions and argued that small nations are more liable to trade and have lesser nominal rigidities. Therefore, suitable for the formation of a currency union.

Kenen (1969) introduced product diversification as an important criterion for an OCA. He argued that diversity in products of the countries and the number of single product regions in a currency union is most relevant to form OCA as compared to labour mobility. Product diversity is a key factor for labour to move within a region. He further argues that when a region has a well-diversified export sector and homogenous labour with high mobility, there is a tendency for the region to form an OCA. Mundell (1961) concentrated on the cost involved in joining a currency union whereas McKinnon (1963) and Kenen (1969) focused on the conditions for enhancing the benefit for an Optimal Currency Area. The OCA focuses on the balance between the benefit of reduced trade cost and the cost of abandoning monetary sovereignty and business cycle synchronization of the member states. The theory concludes that there is a need to experience symmetric reactions to external shocks to lower the cost of regionally coordinated policies. Also, Mundell (1973) argued that using a common currency may help an area to be optimal. This will reduce unsynchronized economic shocks leading to the creation of an Optimal Area. Mundell further posits that purchasing power parities should exhibit steadiness overtime. Thus, with the free movement of capital, there is the tendency of attaining an OCA.

#### **Theory on Exchange rate volatility**

Exchange rate volatility shows the level of risk involved with changes in the exchange rate. Exchange rate volatility is associated with either rise or fall in the level of exports depending on the assumptions of the variable. Conventionally, exchange rate volatility is argued to hurt exports since it increases the risk or shock involved in international trade. The prospective gains from international trade by firms are uncertain due to exchange rate volatility due to currency risk (Broll, 1994, 1995). Moreover, even with well-developed forward markets for some currencies, exchange rate volatility cannot be eliminated since it affects exporting firms in diverse channels of trade. An increase in exchange rate volatility increases the risk involved in trading, therefore, reduces the volume of trade with risk-averse firms. Contrarily, another theory on exchange rate volatility on exports shows even in the face of risk associated with volatility, it presents an opportunity for firms to maximize profits. In this background, exchange rate volatility can have a positive impact on the volume of trade. The option theory stipulates in alignment that firms with the option to export are better off when the exchange rate is volatile (De Grawe, 1992).

Empirically, Rose (2000) assessed the impact of currency union on Trade when exchange rate volatility is eliminated. The study focused on the European Monetary Union spanning 1970 to 1990 prior EMU currency union in 1999. The study used Ordinary least squares with country fixed effects. The study found a large positive effect on trade even though the negative effect of exchange rate volatility was minimal. The study showed that currency union was economically and statistically significant therefore countries in a union will trade three times more in a union than countries using their sovereign currency. It concludes that currency unions will yield a greater impact on international trade when countries integrate. Mkenda (2001) examined the possibility of the East African Community as an Optimal Currency Area. The study used data spanning from 1981 to 1998.

The methodology adopted was the Generalized Purchasing Power Parity (GPPP) and standard indices. The results show that there is convergence in inflation and countries are affected by similar shocks, therefore, it could be an OCA but the monetary union is highly politically driven if the need. Kishor & Ssozi (2009) evaluates the East African Community based on the Optimal Currency Area criteria to expatiate whether the community forms a currency area using data span from 1970 to 2007. The results show that the shares of common shocks are low but the business cycle was synchronizing among members. The study concludes that EAC could be a likely Optimal Currency Area. Shiekh (2014) assessed the feasibility of a monetary union in the East Africa Community using data span from 1980 to 2010. The methodology adopted in the study was the optimal currency area criteria, Hodrick-Prescott (HP) and Band Pass (BP) filters and structural VAR. The structural VAR test showed that there was improvement in macroeconomic shocks response after the EAC treaty was signed while the response to monetary shocks were inconclusive. The HP and BP showed that four of the five members had a synchronized business cycle. The study concludes that the East Africa Community is not an optimal currency area and monetary union cannot be a panacea for economic problems. Cárcel et al. (2014) examined the feasibility of currency union in East Africa Community (EAC) using monthly inflation rate data spanning from January 2004 to December 2013. The methodology deployed in the study was a fractional integration approach on inflation rate notably the Engle and Granger's (1987) and Gil-Alana (2003) methodology. The results showed that there is heterogeneity in the inflation rate. Contrarily, forming a currency union will eliminate inflation bias to stimulate stability. Lepetit et al., (2015) analyzed the possibility of the East Africa Community (EAC) to form a monetary union using data span from 2003 to 2010. The study developed a model of policymakers' decision making which builds on Strobel (2005, 2007) to evaluate the political drive in establishing a monetary union. The results showed that eliminating uncertainty and compensation will ensure countries willing to join the monetary union. The study concludes that there is a need for institutions to ensure greater certainty for form a monetary union. Muthui et al., (2016) analyzed the possibility of East Africa Community (EAC) monetary integration using data span from 1996 to 2014. The methodology deployed in the study was the Generalized Purchasing Power Parity (GPPP) to investigate whether EAC forms an OCA. The results showed that there is no cointegration between countries therefore the EAC does not form an OCA hence monetary union will come at greater costs. Redda et al., (2017) analyzed the feasibility of monetary union in the Southern Africa Development Community (SADC) and East Africa Community (EAC) using data span from 1986 to 2015. The study adopts Mckinnon (1963) trade openness to evaluate how the economies are opened for international trade. The results showed that countries in EAC have not attained the trade openness criterion therefore not liable to maximize the benefits of currency union hitherto not an OCA. Caporale et al. (2018) assessed the prospects of a monetary union in the East Africa Community using a monthly Real Exchange rate from 1990 to 2015. Several econometric techniques were adopted in the estimation notably unit root tests, univariate fractional integration analysis, bivariate fractional tests and Fractional Cointegrated Vector Autoregressive (FCVAR). The results showed that there exists a long-run integration between the members therefore a monetary union is feasible in the East Africa Community. Gitimi (2018) examined the feasibility of adopting a common currency in the East Africa Community (EAC) using quarterly data span from 2000 to 2015. The methodology adopted in the study was the Macroeconomic Convergence Criteria (MCC) and the Generalized Purchasing Power Parity (GPPP). The results showed that there was a long-run convergence among members of EAC therefore East Africa Community is an optimal currency area. Finally, Preis & Rappe (2019) assessed the optimality of the East Africa Community in forming an Optimal Currency Area (OCA) using data span from 1995 to 2017. The methodology used in the study was the optimal currency area criteria. The results showed that there exists an asymmetry of shocks, structural differences, and attainable yet unsustainable nominal convergence criteria, therefore, miniature evidence for EAC forming an OCA.

## METHODOLOGY

### Dataset

The study used a dataset with 360 bilateral trade observations spanning from 2000 to 2017 (some observations are missing for the dependent variable). Export data was sourced from United Nations Conference on Trade and Development (UNCTAD), and International Monetary Fund Direction of Trades (DOTs). GDP, FDI, and GDP per capita were sourced from World's Bank World Development Indicators (WDI), the distance was sourced from CEPII, Real Effective Exchange Rate (REER) from United Nations Conference on Trade and Development (UNCTAD) and WDI, data on Tariff and Non-Tariff were obtained from World Bank's ESCAP and Rule of Law was obtained from World Governance Indicators, GDP at Purchasing Power Parity was sourced from WDI and Intra-trade was sourced from UNCTAD.

### Model specification

To evaluate the impact of adopting a common currency on trade, the study considers the augmented gravity model of international trade following the work of Rose (2000), Glick & Rose (2001) among others. The model is specified as follows;

- (i) The Effect of a common currency on trade

$$X_{ijt} = \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln(Y_i Y_j / Pop_i Pop_j) + \beta_3 \ln D_{ij} + \beta_4 Cont_{ij} + \beta_5 Lang_{ij} + \beta_6 Comcol_{ij} + \tau CU + r(V_{ij}) + \delta Volat_{ij} + \varepsilon_{ij} \dots 3.1$$

- (ii) The Impact of tariff and nontariff on trade

$$X_{ijt} = \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln(Y_i Y_j / Pop_i Pop_j) + \beta_3 \ln D_{ij} + \beta_4 Cont_{ij} + \beta_5 Lang_{ij} + \beta_6 Comcol_{ij} + \ln \beta_7 RL_{ij} + \ln \beta_8 FDI_{ij} + \ln \beta_9 Tariff_{ij} + \ln \beta_{10} Nontariff_{ij} + \varepsilon_{ij} \dots 3.2$$

Where  $i$  and  $j$  denotes countries,  $t$  denotes time, and the variables are defined as:  $X_{ijt}$  denotes the value of bilateral trade (exports) between  $i$  and  $j$ ,  $Y$  is real GDP,  $Pop$  is population,  $D_{ij}$  is the distance between  $i$  and  $j$ ,  $Cont_{ij}$  is a binary variable that is unity if  $i$  and  $j$  share a land border,  $Lang_{ij}$  is a binary variable that is unity if  $i$  and  $j$  have a common official language,  $Comcol_{ij}$  is a binary variable that is unity if  $i$  and  $j$  were colonized by the same colonial master,  $CU_{ij}$  is a binary variable that is unity if  $i$  is the reporter using convertible currency and  $j$  is the partner at time  $t$ ,  $V_{ij}$  is the volatility of the bilateral (between  $i$  and  $j$ ) real effective exchange rate in the period before  $t$ ,  $RL_{ij}$  denotes the product of rule of law in the country-pairs,  $Tariff_{ij}$  represent the charge between country-pairs,  $Nontariff_{ij}$  represent the effect of nontariff between country-pairs,  $FDI$  represent foreign direct inflow between the country-pairs,  $\varepsilon_{ij}$  is a vector of nuisance coefficients, and represents the myriad other influences on bilateral exports, assumed to be well behaved,  $Volat_{ij}$  is a binary variable that is unitary if the exchange rate is low peaked in the period  $t$  ( $PEAKNESS$ ).

Where  $I = 1, 2, \dots, N$  is the number of countries where  $N=5$ ,  $t$  is the time-series dimension of the data ( $T=18$  years).

However, South Sudan was not used in the estimation due to limited data on the various variables of interests.

### **Definition of Variables and Expected Signs**

Export was adopted in the model to represent trade flows between countries since the level of imports is usually underestimated. GDP was used to proxy for the economic mass of the country in the model. It was measured as the log product of the GDP of country-pairs. GDP per capita was used as a proxy for all other variables that were not specified in the model. It was measured as the log product of GDP per capita of the country-pairs in the model. Distance is the transportation cost involved in trading between the two countries. The coefficient of sharing a land border is expected to have a positive relationship with trade. Spatial theory of trade depicts that countries sharing border tends to cooperate to enhance trade. The coefficient of Language is expected to have a positive relationship with trade. Adam Smith argued in 'Wealth of Nations' that common language enhances trade and exchange utilizing effectively communicating the task in hand to the trading partners and easily convincing parties to know it is in their best interest. The coefficient of a common currency is expected to have a positive effect on trade.

Exchange rate volatility was computed as the standard deviation of the moving average of the natural log of real effective exchange rate (REER). The study used real effective exchange rate data in the computation of the exchange rate volatility using the standard deviation approach due to the latest development in exchange rate volatility measures (Serenis & Tsounis, 2014). Recent development in trade stipulates countries are no more interested in the value of their currency with another country but rather how its currency is valued with their major trading partners. Real effective exchange rate is the nominal effective exchange rate (a measure of the value of several foreign currencies) divided by a price deflator or index of costs. The nominal effective exchange rate (NEER) is the weighted average of the currencies exchange rate with its major trading partners' currencies.

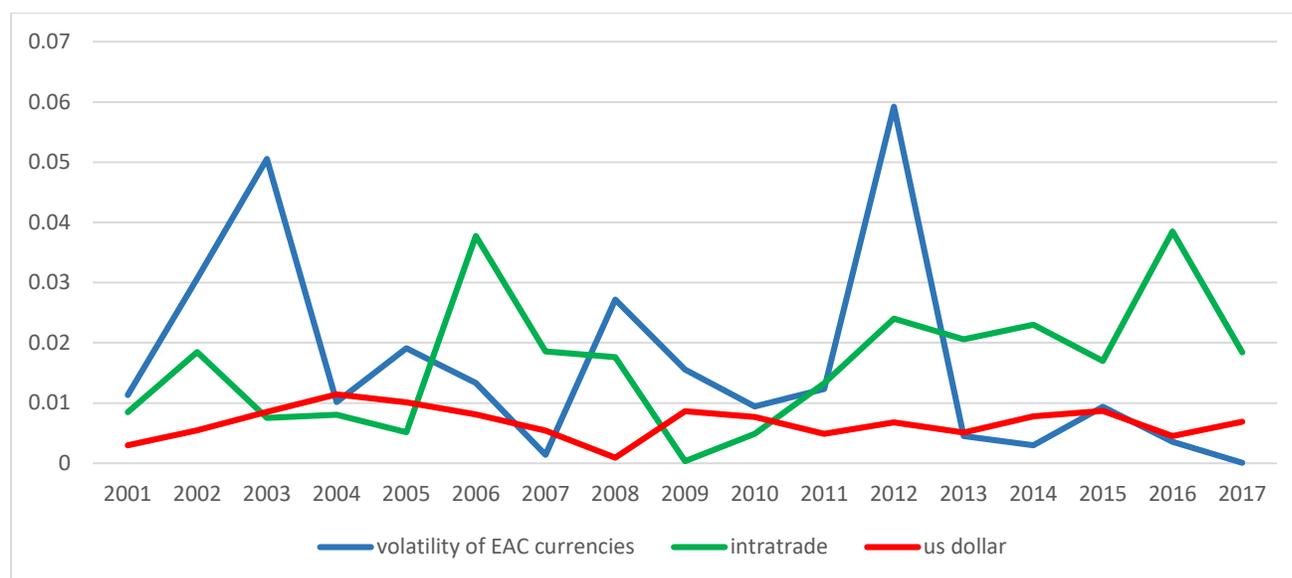
REER is a refinement on the nominal exchange rate with price inflation removed. The coefficient of exchange rate volatility between the countries is expected to have a negative relationship with bilateral trade. Historically, exchange rate volatility has a negative relationship with the volume of trade when countries use sovereign currencies. Etheir (1973) asserted that exchange rate volatility hurts international trade. This assertion has been backed by Clark (1973), Hooper & Kohlhagen (1978) and Gagnon (1993). Additionally, The coefficient of exchange rate peak ( $Volat_{ij}$ ) is expected to have a negative relationship with trade. According to Serenis & Tsounis (2014), the main criticism of using standard deviation as a measure for exchange rate volatility fails to capture the potential effects of high and low peak values of the exchange rate. The high and low peak values refer to the unpredictable factor which affects trade. The peak of exchange rate volatility was computed as the average of the volatility, deducted from the various values and represented by 1 if low peaked and 0 otherwise. Highly peaked exchange rate discourages trade by increasing the cost of trading among trading partners whereas low peaked exchange rate volatility encourages trade.

Tariff is defined as the taxes charged on goods and services imported. According to the World Bank ESCAP, Tariff answers the question, 'Evaluate the effect of tariffs in on agricultural goods.' Nontariff is defined as the taxes charged on total goods including agricultural and manufactured goods. According to the World Bank ESCAP, Nontariff answers the question, 'Evaluate the effect of nontariff in on agricultural goods.'

### **Estimation technique and Empirical Application**

Monte Carlo simulation shows that the gravity model of international trade is best estimated using a nonlinear model (Silva Santos and Tenreyro, 2011). The Poisson Pseudo Maximum likelihood is the best estimator for the gravity model due to the prevalence of zero trade-in data and its prowess of eliminating heteroscedasticity, autocorrelation, catering for model misspecification among others. Furthermore, the PPML estimates is efficient in both small and large sample size (Silva Santos and Tenreyro, 2006). To buttress. The PPML is the best estimator for estimating the coefficients of the gravity model (Bobková, 2012; Martin & Pham, 2015; Vavrek, 2018).

Fig. 1: Trend Analysis of Intra-regional Trade and Exchange Rate Volatility on the East Africa Community



From figure 4.1 exchange rate volatility of the US dollar had a strong relationship with trade than the volatility of the domestic currencies. Most periods were characterized by high volatility of the US dollar coupled with low trade volumes in EAC notably 2003, 2004, 2009 and 2015. Additionally, both volatility of the US dollar and the East African Community currencies depreciated and trade was high. Contrarily, some periods were characterized by low volatility of the US dollar and high volume of trade notably 2002 and 2016. Additionally, 2010 was a period that exhibited a depreciating US dollar and a rising trade volume. Finally, the year 2008 exhibited a depreciated US dollar attributed to the International financial crisis hitherto exchange rate volatility of EAC currencies rises due to the practice of expansionary monetary policy which led to a rise in inflation but trade was falling steadily. In the nutshell, eliminating exchange rate volatility among members will ensure the common currency have a strong effect on intra-regional trade.

#### 4.1: Results for the proposed common currency on trade

The study estimates the effect of a proposed common currency on trade

**Table 1 Poisson Pseudo Maximum Likelihood (PPML) Estimates**

Variables	Coefficients
GDP	1.064** (.4608637)
GDP per capita	1.762 (1.076208)
Distance	-2.100*** (.6403932)
Border	.154 (.2803141)
Language	.117 (.5133092)
Colonizer	.323 (.2054624)
Common Currency (CU)	.771*** (.1602327)
Volatility	.170 (.1516486)
Peakness	-.029 (.0618356)
_cons	-8.041376 (5.614016)

Note: \*, \*\* and \*\*\* represent rejection of null hypothesis at 10%, 5% and 1%.

Author's Estimates

Robust Standard Errors are in the parenthesis.

Sharing a common currency is found to have a positive impact on trade with an estimated coefficient is .771 and statistically significant at 1%. The result shows that adopting a common currency reduces transaction costs, therefore, stimulating trade through savings. The argument is in line with Rose (2000) that adopting a common currency increases trade flows within countries. Theoretically, adopting a common currency ensures greater integration notably political, social, economic and cultural to attenuate ills in the trade bloc.

Exchange rate volatility is found to have a positive but insignificant effect on trade in the community. The estimated coefficient is .170. The result shows that the Kenyan shilling played a key role in stimulating trade in EAC due to its convertibility even though it did not have a significant impact on trade. According to Anyanzwa (2019, cited in [allafrica.com](http://allafrica.com)) showed that about 98% of transactions were made using the Kenyan shilling in EAC. Also, Kenyan shilling dominated transactions in the East African payments system (Central Bank of Kenya annual report, 2018).

Exchange rate peak is found to have a negative but insignificant effect on trade with an estimated coefficient is -.029. The result shows that the trade effect resulting from the convertibility of the Kenyan Shilling attenuated the adverse effect of exchange rate volatility. This result incinerates that there is a greater tendency a foreign currency had a greater influence on trade other than the Kenyan shilling due to the use of sovereign currencies by four members comparative to the trade volume. In this context, the US dollar is the intervention and external reference currency for all five members and the main rate tracked by participants in the market (Adam et al., 2012). According to the Central Bank of Kenya's annual report 2018, countries notably the four other members preferred the use of the US dollar due to the use of sovereign currencies.

#### 4.2: Results for the Effect of Tariff and Nontariff on trade

The study estimates the effect of Tariff and Nontariff on trade

**Table 2 Poisson Pseudo Maximum Likelihood (PPML) Estimates**

Variables	Coefficients
GDP	1.028* (.5414668)
GDP per capita	1.759 (1.332564)
Distance	-1.006 (.7105601)
Border	.352 (.306771)
Language	-.304 (.4864788)
colonizer	-.213 (.2656217)
Rule of Law	.382 (.3383669)
fdi	-.029 (.0842626)
Tariff	-4.644*** (.9241173)
Nontariff	2.489*** (.7787187)
_cons	-4.101 (5.67347)

Note: \*, \*\* and \*\*\* represent rejection of null hypothesis at 10%, 5% and 1%.

Author's Estimates

Robust Standard Errors are in the parenthesis.

Tariff is estimated to have a coefficient of -4.644 and statistically significant at 1%. The result is not startling because countries heavily depend on tariffs on agricultural products as a major source of revenue for budget financing. The results indicate that tariff charged on the primary sector reduced trade in agricultural products by four times. The community was characterized by trade disputes with one another which led to the increased tariffs. Additionally, tariffs were used to protect small-scale producers in country-specific (Khorana et al., 2007). Nontariff is estimated to have a coefficient of 2.489 and statistically significant at 1%. The result is startling but logically plausible because countries characterized by a relatively high volume of trade had a greater tendency to record high nontariff barriers. According to Kurugai et al. (2009), nontariff was a greater barrier to trade notably administrative requirements, taxes/duties, roadblocks, licensing, corruption, and transiting, custom barriers among others. Also, Mkunna (2014) and Bowen (2018) showed that the nontariff barrier had an adverse effect on the volume of trade in EAC.

This study showed that even though exchange rate volatility had a negative but insignificant effect on trade in East Africa Community, the strong impact of foreign currency on trade in EAC poses a greater danger to intra-regional trade due to high demand for the US dollar to facilitate intra-regional trade. The study concludes that adopting a common currency will stimulate relatively greater trade flows. Additionally, the study showed that the elimination of tariffs and nontariff will increase trade by six-folds. The study recommends that EAC have an incentive to adopt a common currency by achieving the nominal convergence criteria. In this background, EAC should focus on providing technical support to all member states to facilitate the attainment of the convergence criteria for the policy to be realized. Also, EAC focus should be on the stability of the common currency to be adopted since a common currency eliminates inflation and exchange rate volatility bias. Thus, EAC should focus on the development of the financial markets due to its ability to reduce the volatility of currency by indexing all financial assets using the common currency and building financial market buffers. Financial institutes are to be listed in the common currency which in turn will attract potential investors to gain confidence in different EAC countries' financial markets. Also, countries should implement institutional framework to ensure transparency. Additionally, EAC should advise countries on the need to monetize their fiscal deficits, which depreciates the value of the currency and increases the debt servicing obligations of countries by adhering to policies initiated by the proposed Central Bank.

## APPENDICE

Number of parameters: 10  
 Number of observations: 292  
 Number of observations dropped: 0  
 Pseudo log-likelihood: -4.246e+09  
 R-squared: .73652326

(Std. Err. adjusted for 20 clusters in pairings)

trade	Robust		z	P> z	[95% Conf. Interval]	
	Coef.	Std. Err.				
GDP	1.064426	.4608637	2.31	0.021	.1611499	1.967703
Percapita	1.761619	1.076208	1.64	0.102	-.3477095	3.870948
distance	-2.099509	.6403932	-3.28	0.001	-3.354657	-.8443615
border	.1536079	.2803141	0.55	0.584	-.3957975	.7030134
language	.1166228	.5133092	0.23	0.820	-.8894447	1.12269
colonizer	.3233818	.2054624	1.57	0.116	-.0793171	.7260807
CU	.7708368	.1602327	4.81	0.000	.4567865	1.084887
volatility	.169866	.1516486	1.12	0.263	-.1273597	.4670918
peakness	-.0290977	.0618356	-0.47	0.638	-.1502933	.0920979
_cons	-8.041376	5.614016	-1.43	0.152	-19.04465	2.961894

Number of parameters: 11  
 Number of observations: 239  
 Number of observations dropped: 0  
 Pseudo log-likelihood: -3.629e+09  
 R-squared: .78671895

(Std. Err. adjusted for 19 clusters in pairings)

trade	Robust		z	P> z	[95% Conf. Interval]	
	Coef.	Std. Err.				
GDP	1.028396	.5414668	1.90	0.058	-.0328592	2.089652
Percapita	1.758567	1.332564	1.32	0.187	-.8532095	4.370344
distance	-1.005876	.7105601	-1.42	0.157	-2.398548	.3867965
border	.352307	.306771	1.15	0.251	-.2489532	.9535672
language	-.3040378	.4864788	-0.62	0.532	-1.257519	.6494431
colonizer	-.2130812	.2656217	-0.80	0.422	-.7336902	.3075279
RL	.3822922	.3383669	1.13	0.259	-.2808947	1.045479
fdi	-.0290477	.0842626	-0.34	0.730	-.1941994	.136104
Tariff	-4.643735	.9241173	-5.03	0.000	-6.454972	-2.832499
nontariff	2.488997	.7787187	3.20	0.001	.9627364	4.015258
_cons	-4.100534	5.67347	-0.72	0.470	-15.22033	7.019263