

Multilateralism, Institutional quality & Trade Flows: ECOWAS Experience.

Dr. Luqman Olanrewaju Afolabi

Abstract

Even though it is a very significant building block of regional integration, very little research has investigated ECOWAS trade flows and institutional quality among its members. This article fills in this gap by examining the impact of institutional quality on ECOWAS trade flows among its members and its interacting effects spanning from 1996 - 2017. Poisson's Pseudo-Maximum Likelihood Fixed Effect (PPML) technique was employed to provide a further estimation. We also incorporate multilateral resistance term to obtain unbiased estimates. The results indicate that ECOWAS is a regional force. High political instability and feeble governance have hindered ECOWAS's trade performance over the years. The results suggest that regional integration, institutional quality and market size play a significant role in promoting and improving regional integration. Therefore, ECOWAS needs to improve and strengthen feeble institutions across the ECOWAS region. This article further showcases the importance of properly accounting for multilateral resistance terms.

Background of the study

The global economy has tremendously increased in magnitude since 1990 and has been a major development in history, in spite of the post-2007 great recession. India, China and other emerging giants representing one third of humanity are speedily catching up with developed countries. This is even as the world economy in general continues to reinvent itself and fight ahead. Global development, living standards and the welfare of billions of people around the globe, including the poorest, is progressing at an extraordinary level, including in Africa (World Trade Report, 2017).

However, global trade has been seen of as a panacea to achieving economic growth and the improvement of societies including the mitigation of poverty and hunger (Winters, 2004). Africa's contribution to world trade has remained comparatively low (Bouet and Roy, 2008). According to UNCTAD Statistics (2018), it indicated that the total annual trade growth rate for ECOWAS between 2000 and 2017 stood at 26.37% - 25.27%, while from 2014 - 2016 it recorded a negative annual trade growth rate which stood at -4.99, -36.46 and -17.62 respectively. In order for any nation to achieve full integration into the world economy and to benefit from trade strategies in an outward oriented level, institutional quality is critical. According to Anderson (2001), trade can be stalled by ill-functioning institutions and the volume of trade can be reduced by bad institutions (Anderson and Marcouiller, 2002). The quality of institutions and openness likely exhibits causality in a bidirectional way (Dollar and Kraay, 2002). As Anderson and Marcouiller (2002) indicated, a major obstacle in the business world at the market level is corruption. Indeed, corruption is among the major causes of the poor performance facing ECOWAS. Riley (1998) divided the corruption in African communities into three categories: systemic, systematic and incidental. According to the World Bank (2000), about two trillion dollars consumed annually is

due to mismanagement and fraud, which amounts to about 5% of the world's total gross domestic product (GDP). The World Bank further stressed that corruption is the main obstruction to growth and development because it weakens the rule of law and reduces economic performance and growth rates. Corruption can take several different forms, namely extortion, nepotism, bribery, fraud, peddling, influence peddling and embezzlement (Klitgaard, 1998). For instance, Quartey (2012) reported that a recent West African trade hub survey indicated that per 100 km, 17 controls were in existence along the border of ECOWAS countries, from which on average, \$54 was collected as a bribe. He further identified bribery as a major barrier to the movement of goods, people and services across ECOWAS areas.

Similarly, the Global Financial Integrity report for developing nations between the periods of 2005 - 2014 indicated that illegal financial leakages from Sub-Saharan Africa ranged from 5.3% to 9.9% of the total trade in 2014, which represents a ratio that is more than any other geographical zone studied (GFI, 2017). In a similar trend, according to a transparency international report, (2017) Sub-Saharan countries remain the worst performing region with an average score of 32, while other countries that slightly improved under ECOWAS including Senegal and Côte d'Ivoire. Also, looking at the Political Terror Scale rating, it indicated that ECOWAS countries fall under the category of 3 – 5, which signifies instability in the region. Bannon and Collier (2003) proved that there is a clear link between a high dependence on primary commodities and conflicts. This is because the struggle to control the natural resources and illegal smuggling leads to such conflicts. The ECOWAS region typically is characterized by the smuggling of resources and conflicts, most of which are internal and small rather than erupting into large-scale wars (McGowan, 2006). Since 1998, more than 35-armed groups have been operating in more than two thirds of the 15 ECOWAS states (Florquin and Berman, 2005).

In lieu of the emanating issues affecting ECOWAS, this research thus aims to examine the impact of institutional quality on ECOWAS trade flows and by extension, this study will also examine the interacting effect through the use of the PPML technique by incorporating time-varying multilateral trade resistance into our model. This paper is organized as follows. Section two will present a brief literature review. Section three deals with the methodology. Section four presents the results. Section five concludes with policy recommendations.

Literature Review

The gravity model was first employed as a tool of analytical means under the international trade theory dating back to the studies by Tinbergen (1962) & Poyhonen (1963). The gravity model was improved further by Anderson (1979), Aitken (1973), Linnemann (1966), Deardorff (1998), Bergstrand (1985), Helpman et al (2008) and Anderson and Van Wincoop (2003).

However, Holmes (2005) carried out a study on SADC over the period of study and discovered that there is the presence of convergence in SADC. However, Holmes (2005) detected that there was no convergence within ECOWAS in the period of study. Jones (2002) proved that there was convergence in ECOWAS for the period of study. Dufrenor and Sannon(2005) hinted that there was no element of convergence in ECOWAS, while Carmignani (2006) proved that there was no

convergence in COMESA within the period of 1980 – 2002. There was the presence of a limited level of convergence within UEMOA within the period of 1990 - 2003 (Van de Boogaerde and Tsangarides, 2005). Kihangire and Mutoti (2006) discovered that there was the presence of convergence within COMESA between 1995 and 2004 and finally, Aziz Wane (2004) hinted that there was convergence in UEMOA within the period of 1965 - 2002. Jalles (2012) selected a regional trading group made up of 21 Countries from South and South-East Asian for the period of 1980 - 2004 using Bayesian Model averaging (BMA). The result showed that the openness of a country or neighboring countries does not have an impact on the nation’s growth, while the RTA impact remains unclear. Devadason (2011) looked at the regional trade bloc of ASEAN 5 using a modified gravity model. The results indicate that China’s integration into ASEAN has improved the size of size of the key ASEAN members’ economy with regard to the export market while the import sources of the other ASEANS countries has not reduced the intra-ASEAN trade flow.

ECOWAS studies using the empirical approach indicate that common borders and distance have had a strong effect on ECOWAS trade. There is also the negative effect of trade flow among ECOWAS members. Moreover, the level of financial and trade openness among the members impedes the level of trade flows in relation to integration (Afolabi, Abu Bakar and Azman, 2015, 2016, 2016, 2017; Foroutan and Pritchett, 1993; Amjadi, Reincke and Yeast, 1996; Longo and Sekkat, 2004; Rahman et al, 2006; Afio, 2010).

In conclusion and to the best of our knowledge, few studies or none at all have been conducted on the ECOWAS trade flow that includes institutional quality. By extension, this study will look at both the direct effect and the interaction effect through the use of Poisson’s pseudo-maximum-likelihood estimation (PPML) techniques and also by incorporating multilateral resistance factors.

Methodology

Model specification

The static gravity model was considered in this section in a one-way model which included time fixed effects, time effects and country effects. Finally, it was used to examine a linear system that considers the selection of firm heterogeneity and export markets. According to the generalized gravity model of trade, the export volume among pairs of nations X_{ij} is a function of their respective incomes or market size (GDP), their geographical distance, their population and a set of dummies, as depicted in the equation below:

$$X_{ij} = \beta_0 C_i \beta_1 C_j \beta_2 POP_i \beta_3 POP_j \beta_4 dist_{ij} \beta_5 F_{ij} \beta_6 \epsilon_{ij} \dots \dots \dots (3.1)$$

Where $C_i(C_j)$ represent the GDP of the exporter (importer), $POP_i(POP_j)$ are the exporter

The main sources of heteroscedasticity in the data are not unique. The variance of the error term may differ with the regressors as well as with the dependent variables or omitted variables. According to Silva and Tenreyro (2006), in the presence of heteroscedasticity, the Poisson's Pseudo-Maximum Likelihood (PPML) performs better than Ordinary Least Square (OLS). Other challenges facing OLS include the issues of zero value omission and endogeneity. Helpman et al (2008) proposed a theoretical approach for the zero values with the introduction of a model that uses the heterogeneity of the firms. Some researchers adapted PPML to predict the trade flow. Siliverstov and Schumacher (2007), Martinez-Zarzoso et al (2007), Westerlund and Wilhelmsson (2007) and Martin and Pham (2008) obtained differing results when comparing the results with the alternative estimators that deal with zero values and heteroscedasticity problems.

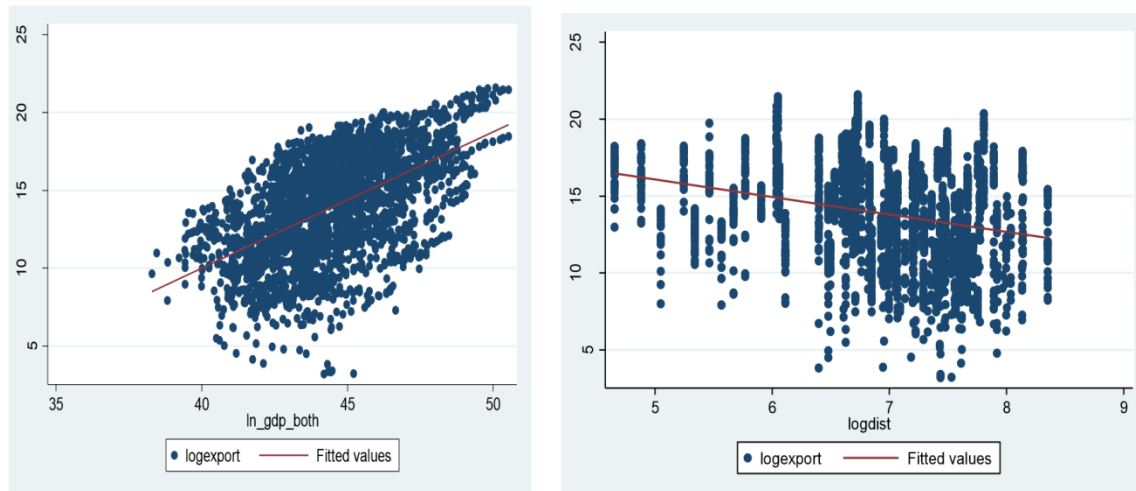
Zeros in trade data and heteroscedasticity, in practice, have been identified by Tenreyro (2006); he found two issues that can generate bias, which is important. Foremost, the data set of trade shows that it is unlikely that the variance of n_{ij} (multiplicative stochastic term) will include several measures of distance that is independent of the countries size. Due to the fact that the projected values of the logarithm of a random variable rest both on the mean and on the higher-order moments of its distribution, the variance of the error term n_{ij} relies on the regressors, violating the condition of OLS consistency. Santos Silva and Tenreyro (2006) suggested that the violation is a serious source of bias in the application of gravity equation. Second, based on the logarithmic transformation, pairs of nations for the bilateral exports that recorded zero were dropped automatically from the sample. Typically, this leads to a 30% loss in the data points. This substantial sample selection is critical and potentially problematic when considering poor or small nations. These two complications can be addressed by estimating the gravity equations in its multiplicative form. The Poisson estimator has extra properties for policy-applied investigators when using gravity models. It is consistent in the presence of fixed effects which can be incorporated into our model as a dummy. This is an unusual property of nonlinear maximum likelihood estimators. Many have failed to understand the properties involved, including fixed effect. This key point is particularly significant for gravity modelling due to the fact that theory-consistent models require the inclusion of fixed effects by both the importers and exporters.

Furthermore, another modification to the existing specification is time and the country effects, which account for time-variant multilateral price terms, as proposed by Baldwin and Taglioni (2006) and Baier and Bergstrand (2007). According to Baldwin and Taglioni (2006), they stated that time-varying nation dummies can completely remove the bias stemming from the 'gold medal error'; i.e. the omission or incorrect specification of the terms known as multilateral trade resistance by Anderson and Wincoop (2003). This study will use models from Frankel (1993), Thede and Gustafson (2012), Sharma and Chua (2000), Hassan (2000, 2001) and Abidin, Bakar and Sahlan (2013) for this study. Small adjustments to this model will be made by bringing in a dummy and other economic, political and institutional variables in order to answer the stated objectives. This model examines the impact of institutional quality on ECOWAS trade. Looking beyond the major determinants to examine the likely impacts of institution on ECOWAS trade is imperative. The estimation technique employed was Poisson pseudo-maximum-likelihood estimation (PPML). This method was introduced into gravity modeling in order to capture the zero-trade matrix that usually occurs in trade (Export and Import). Santos Silva and Tenreyro

Result Interpretations

Diagram (A) shows that using a combined economic mass of importing and exporting nations, i.e. the GDP product of ECOWAS countries, represents the explanatory variable. The scatter plot indicates a positive relationship between the two variables. Furthermore, the best line is upward sloping. The graphical evidence therefore provides further proof that larger country pairs tend to trade more in ECOWAS. The scatter plot (B) is suggestive of a negative relationship. This impression can be proved further by using the line of best fit, which shows as being strongly downward sloping. In conclusion, country pairs that far apart tend to trade less.

AB



The PPML results reported in parentheses are semi-robust, which is in line with Santos Silva and Tenreyro (2010). All regressors are performed by the Poisson pseudo-maximum likelihood that includes time-varying exporters and importers as fixed effects as suggested by Anderson and Van Wincoop (2003). It is imperative to mention that the addition of the interaction term can lead to multicollinearity. This is since the interaction term can be strongly correlated with the actual variables involved in constructing them (Darlington, 1990). In order to avoid this problem, the interaction term was orthogonalized using the following steps. First, the interacting variables of $IntratFTA_{PTSij}$, $IntractFTACorruptij$ and $IntractFTAREgulatij$ were regressed separately in relation to FTA, the PTS index, the level of corruption index and the regulatory quality index variables. Secondly, the regression of each residual was taken from the first step and used as the interaction term (Burill, 2007).

It is very important to discuss the elasticity of the GDP exports and imports under the ECOWAS countries. The GDP of the importing countries within ECOWAS was found to be positive and significant, with both at a 5% significance level. This implies that the 1% increase in the GDP of importing nations within the ECOWAS importation will increase by 4.09%. We can say that GDP represents economic size and it represents what Poyhonen (1963) and Pulliainen (1963) called the trading capacity of a country. The exporting countries' GDP represents its productive capacity and it is also a parameter used to measure the range of product varieties available for export. The GDP

imports represent an indicator of the capacity to import goods. It is expected that both incomes of the countries within the region should positively have an impact on the bilateral flow of trade (Linnemann, 1966; Poyhonen, 1963; Pulliainen, 1963; Tinbergen, 1962). The coefficient of the population j was found to be negatively significant under PPML. This negative sign is consistent with some of the previous literatures, such as that by Oguledo and MacPhee (1994), Linnemann (1966), Blomqvist (1994) and Matyas et al (1997). They concluded that the trading populations of countries affected the trade flow negatively and that it remained significant. With a 1% decrease in population j , imports will to reduce by -5.86% to -9.33%. Generally, we can say that the expected sign of population parameters is always unclear (Brada and Mendez, 1983).

Table 4.1
Poisson Pseudo-Maximum-Likelihood Estimation Results Before and After the Interaction Effect (1997-2017)

Variables	PPML		PPML (Interacting effect)	
	Coef	T-test	Coef	T-test
Contig	1.38***	7.70	1.32***	7.48
lnpopulationi	.326	0.23	-.205	-0.16
lnpopulationj	-5.86*	-1.73	-5.65*	-1.90
lnGDPi	1.48	1.23	1.86	1.33
lnGDPj	4.09**	2.12	4.21**	2.22
lnGDPSimilarity	1.23***	5.70	1.26***	5.92
lnGDPPCdifferences	-.265	-1.38	-.275	-1.47
lnexchangeij	.012***	5.30	.014***	5.90
FTA	-3.26**	-2.35	-0.072	-0.07
LnPtsj	-5.02	-1.19	-3.77	-1.11
LnDistance	-.622***	-4.21	-.666***	-4.50
Commonlang	.385**	2.22	.392**	2.23
LnCorruptj	-6.04	-1.52	-7.99**	-2.13
LnRegulatoryj	-6.34***	-2.90	-9.36***	-4.68
IntratFTAPTSij			1.09	1.16
IntractFTACorruptij			-8.91***	-3.50
IntractFTAREgulatij			-1.58	-0.95

Notes: ***, ** & * denotes level of significance at 1%, 5% and 10% respectively.

Logically, the importer's income and population i are measures of the potential import demand while the exporter's income and population j can be an indicator for the exporter's available supply (Linnemann, 1966; Aiken, 1973). Furthermore, the distance variable was included into the model to capture the transaction cost. Distance was discovered to have a strong negative effect on the overall volume of trade among countries i to j within ECOWAS by 1%, which leads to a reduction in exports with an average of 0.62%.

This finding is in line with the studies of Frankel, Stein and Wei (1995), Soloaga and Winters (2001), Thoumi (1989a, b) and Breuss and Egger (1997, 1999). Overall, these results suggest that transportation costs have a great importance on most small ECOWAS economies. The coefficient of the similarity of the GDP was positive and significant. This indicates that with a 1% per cent increase in the similarity index of the GDP, ECOWAS export trade will increase by 1.23%. The level of importance of this variable on trade will be determined by its closeness and similarity in the economy. The high coefficient of the variable is very common in the literature (Egger and Pfaffermayr, 2004).

Looking at income per head variable, the positive and significance coefficient of the variable can be denoted by the development gaps among the countries within ECOWAS that largely affect the flow of exports. Countries within ECOWAS seem dormant when it comes to inter-industry trade (Kahouli and Maktouf, 2013). The variable common border (Contig) was found to be both positive and significant. Common border positively affects trade, which is in line with the classical results of the gravity models. Common borders are expected to have a positive coefficient because the countries selected for this study are from the same region. West African countries that share the same border within ECOWAS will trade 1.38% more than those who do not share a common border. The coefficient of the common language variable for this study was positive and significant, signifying that two or more countries within ECOWAS that share the same language that is official tend to spur trade between them. The coefficient of a common language within ECOWAS increases by 1% and this will tend to increase the export trade within ECOWAS by 0.38%. An increase in the trade of two or more countries sharing the same official language within the region (i.e. i to j) by 1% will leads to an increase in exports by 0.38%. This finding is in line with Stack and Pentecost (2011).

It is very important to examine the impact of the institutional quality variables incorporated into our models and to see the overall behavior of the series. For interpretation purposes, the three indexes of institutional quality were incorporated into the models, namely the level of corruption, political instability and regulatory quality. The regulatory quality variable was negatively significant under PPML, which indicates that one standard deviation decrease in regulatory quality will lead to a 6.34% increase in bilateral trade within the ECOWAS region. Our result is in line with the previous findings such as by Mehlum et al. (2006) and Fosu (2011). They indicated that the institutional considerations remain essential if African countries want to enhance their trade and development. However, the exchange rate variable coefficient was positive, significant and under the 1% significant level. The positive coefficient suggests that there is an appreciation of the

real exchange rate which will tend to encourage ECOWAS exports from i to j. The estimated results which indicate depreciation denote that the depreciation of the real exchange rate by 1% would increase the ECOWAS exports from i to j by 0.12% .

In conclusion, it is very important to analyze the impact of FTA on ECOWAS regional trade. Under this estimation, the variable was negative and significant under the two estimates. This indicates that the ECOWAS export will increase by -3.26% if 1 unit of improvement occurs under FTA. The results show that there is a trade diversion. The proliferation of FTA has generated a lot of criticism. One of criticisms is the fear of trade diversion; i.e. passing an effective non-member nation toward a member nation that is less efficient concerning production. FTA is a tool used to reduce trade barriers among the signatories and it leads to an expansion of trade at the bilateral level among its members, which could also be at the expense of other non-members.

Interacting Effect

Our focus in this section will mainly be on the interacting variables and we will also look at the other variables that changed after the interaction was included. Our motive in this section is to examine the indirect impact of the three institutional quality variables included in the previous model (corruption, regulatory quality and political instability) by using interaction.

Since ECOWAS as a regional body has fully implemented FTA, our objective is to ascertain whether institutional quality impedes or enhances FTA empirically. According to the table above, the specifications include the variables that were interacted with such as political instability, regulatory quality and corruption. The previous negative significant levels remain in this model, which is in line with the model that was not interacted with. Nevertheless, with an increase in precision based on the parameter of corruption function (-7.99%), the interacted variable between corruption and FTA was found to be statistically significant at 1% (-8.91) under PPML. This indicates that corruption affects FTA adversely, which means that the free flow of goods can be hampered by bribery along the border and by the level of corruption in each country within ECOWAS. This finding is in line the previous submission that identified corruption as a major hindrance to the free flow of goods within ECOWAS. Quartey (2012) discovered that the recent West African trade hub survey indicated that per 100 km, 17 controls were in existence, from which, on average, 54 dollars was collected as a bribe along the borders of all ECOWAS countries. He further identified bribery as a major barrier to the movement of goods, people, and services across the area. In addition, an average delay of 55 minutes per control point exists across the borders of each country within the region''. We can conclude that corruption serves as extra burden to the free flow of goods. Another variable of interest is the regulatory quality index; this variable was introduced to measure the effectiveness of the regulatory parameters within ECOWAS. The interaction of regulatory quality and FTA was found to be statistically insignificant but remained negative. This shows that regulatory quality effectiveness does not have an impact on FTA.

However, it is very important to discuss the FTA's impact within ECOWAS after the interaction. The coefficient of FTA is both negative and significant, which is in line with the previous model that was not interacted with; the coefficient reduced after interactions from -3.26 to 0.072. Generally, we can say that the coefficient of all of the variables reduced after interaction except

for GDP, which was not significant under both models. In addition, the variables maintained the same sign as the previous model. In conclusion, we can say that the quality of the institutions in ECOWAS impedes the trade flow among the ECOWAS member. This section conducted an empirical investigation on the trade flows and bilateral trade relations within the ECOWAS region through the use of estimation techniques. It is essential to discuss the magnitude of some of the variables, which seems to be very high; a higher coefficient is not strange in the context of the gravity model of the trade literature. These results are in line with Sandberg, Seale and Taylor (2006), Egger and Pfaffermayr (2004), Stack and Pentecost (2011) and Thede and Gustafson (2012). All of the variables were logged, so then it is assumed that the degree of the elasticity is a unit less.

Conclusion

The empirical results show how institutional quality and international trade flows at the regional level are related; this has just begun to surface following the development of improved datasets. However, little evidence so far seems to be diverse and augments the confusion. The split in the available evidence in the initial analyses of international trade and corruption, the rising intensity of feeble institutions and the faltering export flows in ECOWAS, and also the inadequate comprehensive study of ECOWAS economies, has motivated this article.

Using the trade flow data of the exports in the period of 1996-2016, we discovered that institutional quality (political unrest and regulatory quality) adversely affects ECOWAS and its members, which in turn impedes on the imports and exports of ECOWAS trade. Our findings are in line with the views that institutional quality (corruption) increases transaction costs, which can lead to imperfect contract attribution. This can also lead to inefficiencies that are harmful to global trade (Kaufman and Wei, 1999; Myrdal, 1968; Marcouiller, 1999). Given the critical role that regional integration plays in the ECOWAS members' developmental process, our empirical findings indicate that feeble institutional quality adversely affects exports and trade flows. We recommend for the ECOWAS policymakers to develop policies that can strengthen the existing feeble institutions. This study also discovered that ECOWAS trade flows have a positive impact on export trade. Consequently, we implore the policy makers in ECOWAS to pursue full monetary integration and to strengthen regionalism up to the custom union level. The conclusion of this article is that the import and export trade flows of the ECOWAS trading bloc would increase if all ECOWAS countries became highly transparent, economically stable and maintain strong institutions.

References

- Abidin, I. S. Z., Bakar, N. A., & Haseeb, M. (2015). Exploring trade relationship between Malaysia and the OIC member countries: A panel cointegration approach (1995-2012). *Asian Journal of Scientific Research*, 8(1), 107.
- Afolabi, L. O., Aznin, A. B., & Izraf, A. A. (2017). ECOWAS Regional Integration and Trade Effect: A Dynamic Panel Cointegration Method Using the Gravity Model. *International Journal of Economic Perspectives*, 11(1), 165-172.
- Afolabi, L. O., Bakar, N. A. A., & Aziz, A. (2016). THE GRAVITY MODEL APPROACH: AN APPLICATION ON THE ECOWAS TRADING BLOC. *The South East European Journal of Economics and Business*, 11(1).
- Afolabi, L. O., Bakar, N. A. A., & Aziz, M. I. A. (2016). Openness And Ecowas Regional Trade: A Panel Cointegration Analysis Using A Gravity Model. *Aktual'ni Problemy Ekonomiky= Actual Problems in Economics*(177), 319.
- Aitken, N. D. (1973). The effect of the EEC and EFTA on European trade: A temporal crossection analysis. *The American Economic Review*, 63(5), 881-892.
- Amjadi, A., Reincke, U., & Yeats, A. J. (1996). Did external barriers cause the marginalization of sub-Saharan Africa in world trade? (Vol. 1586): World Bank Publications.
- Anderson, E. (2005). Openness and inequality in developing countries: A review of theory and recent evidence. *World development*, 33(7), 1045-1063.
- Anderson, J. E. (1979). A theoretical foundation for the gravity equation. *The American Economic Review*, 69(1), 106-116.
- Anderson, J. E., & Marcouiller, D. (1999). Trade, insecurity, and home bias: an empirical investigation. Retrieved from
- Anderson, J. E., & Marcouiller, D. (2002). Insecurity and the pattern of trade: An empirical investigation. *Review of Economics and statistics*, 84(2), 342-352.
- Anderson, J. E., & Van Wincoop, E. (2003). Gravity with gravitas: a solution to the border puzzle. *American economic review*, 93(1), 170-192.
- Anderson, K. (2001). Economy-wide dimensions of trade policy and reform: Centre for International Economic Studies.
- Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of international Economics*, 71(1), 72-95.
- Baldwin, R., & Taglioni, D. (2006). Gravity for dummies and dummies for gravity equations. Retrieved from
- Baldwin, R., & Taglioni, D. (2006). Gravity for dummies and dummies for gravity equations. Retrieved from

Bannon, I., & Collier, P. (2003). *Natural resources and violent conflict: Options and actions*: World Bank publications.

Bergstrand, J. H. (1985). The gravity equation in international trade: some microeconomic foundations and empirical evidence. *The review of economics and statistics*, 474-481.

Bergstrand, J. H. (1985). The gravity equation in international trade: some microeconomic foundations and empirical evidence. *The review of economics and statistics*, 474-481.

Blomqvist, P., Pettersson, A., & Hyenstrand, P. (1994). Ammonium-nitrogen-A key regulatory factor causing dominance of non-nitrogen-fixing cyanobacteria in aquatic systems. *Archiv fur Hydrobiologie*, 132(2), 141-164.

Bouet, A., Mishra, S., & Roy, D. (2008). Does Africa trade less than it should, and if so, why? The role of market access and domestic factors: *Intl Food Policy Res Inst*.

Brada, J. C., & Mendez, J. A. (1983). Regional economic integration and the volume of intraregional trade: a comparison of developed and developing country experience. *Kyklos*, 36(4), 589-603.

Breuss, F., & Egger, P. (1997). Use and misuse of gravity equations in European integration research. Retrieved from

Breuss, F., & Egger, P. (1999). How reliable are estimations of East-West trade potentials based on cross-section gravity analyses? *Empirica*, 26(2), 81-94.

Burill, D. (2007). Modelling and interpreting interactions in multiple regression, Internet.

Carmignani, F. (2006). The road to regional integration in Africa: Macroeconomic convergence and performance in COMESA. *Journal of African Economies*, 15(2), 212-250.

Deardorff, A. (1998). V. 1998. Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World. *The Regionalization of the World Economy*. Devadason, E. S. (2011). Reorganization of Intra-ASEAN 5 Trade Flows: The 'China Factor'. *Asian Economic Journal*, 25(2), 129-149.

Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. *Journal of economic growth*, 7(3), 195-225.

Dollar, D., & Kraay, A. (2003). Institutions, trade, and growth. *Journal of monetary economics*, 50(1), 133-162.

Egger, P., & Pfaffermayr, M. (2004). Distance, trade and FDI: a Hausman–Taylor SUR approach. *Journal of Applied Econometrics*, 19(2), 227-246.

Egger, P., & Pfaffermayr, M. (2004). The impact of bilateral investment treaties on foreign direct investment. *Journal of comparative economics*, 32(4), 788-804.

Florquin, N., & Berman, E. G. (2005). Armed and aimless: armed groups, guns, and human security in the ECOWAS region: Small arms survey.

- Fosu, A. K. (2011). Terms of trade and growth of resource economies: A tale of two countries: Working paper//World Institute for Development Economics Research.
- Fosu, A. K. (2013). Institutions and African economies: an overview. *Journal of African Economies*, 22(4), 491-498.
- Geraci, V. J., & Prewo, W. (1977). Bilateral trade flows and transport costs. *The review of economics and statistics*, 67-74.
- Hassan, M. K. (2000). Trade relations with SAARC countries and trade policies of Bangladesh. *Journal of Economic Cooperation*, 21(3), 99-151.
- Hassan, M. K. (2001). Is SAARC a viable economic block? Evidence from gravity model. *Journal of Asian Economics*, 12(2), 263-290.
- Hassan, M. K. (2001). Is SAARC a viable economic block? Evidence from gravity model. *Journal of Asian Economics*, 12(2), 263-290.
- Helpman, E., Melitz, M., & Rubinstein, Y. (2008). Estimating trade flows: Trading partners and trading volumes. *The Quarterly Journal of Economics*, 123(2), 441-487.
- Holmes, T. (2005). What drives regional trade agreements that work? : Institut universitaire de hautes études internationales.
- Jalles, J. T. (2012). Openness, regional trade agreements and growth: evidence from Asia. *Asian Economic Journal*, 26(1), 63-85.
- Jones, B. (2002). Economic integration and convergence of per capita income in West Africa. *African Development Review*, 14(1), 18-47.
- Joseph Spanjers, M. S. (2017). Illicit Financial Flows to and from Developing Countries: 2005-2014. from Global Financial Integrity <http://www.gfintegrity.org/report/illicit-financial-flowsto-and-from-developing-countries-2005-2014/>
- Kahouli, B., & Maktouf, S. (2013). Regional trade agreements in Mediterranean area: Econometric analysis by static gravity model. *Journal of East-West Business*, 19(4), 237-259.
- Kaufmann, D., & Wei, S.-J. (1999). Does "grease money" speed up the wheels of commerce? Retrieved from
- Kihangire, D., & Mutoti, N. (2006). Macroeconomic Convergence in COMESA. A COMESA Study Project.
- Klitgaard, R. (1988). Controlling corruption: Univ of California Press.
- Klitgaard, R. (1998). International cooperation against corruption. *Finance and development*, 35(1),
3. Linnemann, H. (1966). An econometric study of world trade flows. Amsterdam: North Holland.
- Longo, R., & Sekkat, K. (2004). Economic obstacles to expanding intra-African trade. *World development*, 32(8), 1309-1321.

- Luqman, A. O., Bakar, N. A. A., & Aziz, M. I. A. (2015). Regionalism and ECOWAS Trade Performance: A Gravity Model Approach/Bölgeselcilik ve ECOWAS Ticaret Performansi: Bir Çekim Modeli Uygulaması. *Boğaziçi Journal*, 29(2), 59.
- Martin, W., & Pham, C. S. (2008). Estimating the gravity equation when zero trade flows are frequent. MPRA Paper.
- Martin, W., & Pham, C. S. (2008). Estimating the gravity equation when zero trade flows are frequent. MPRA Paper.
- Martínez-Zarzoso, I. (2013). The log of gravity revisited. *Applied Economics*, 45(3), 311-327.
- Martínez-Zarzoso, I., Bengochea-Morancho, A., & Morales-Lage, R. (2007). The impact of population on CO 2 emissions: evidence from European countries. *Environmental and Resource Economics*, 38(4), 497-512.
- Mátyás, L. (1997). Proper econometric specification of the gravity model. *The World Economy*, 20(3), 363-368.
- McGowan, P. J. (2005). Coups and conflict in West Africa, 1955-2004: Part I, theoretical perspectives. *Armed Forces & Society*, 32(1), 5-23.
- Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal*, 116(508), 1-20.
- Myrdal, G. (1968). Corruption: Its causes and effects. *Asian drama: An inquiry into the poverty of nations*, 2, 953-961.
- Oguledo, V., & MacPhee, C. R. (1994). Gravity models: a reformulation and an application to discriminatory trade arrangements. *Applied Economics*, 26(2), 107-120.
- Olanrewaju, A. L., Bakar, N. A. A., & Aziz, M. I. A. (2015). Regionalism and ECOWAS Trade Performance: A Gravity Model Approach.
- Pöyhönen, P. (1963). A tentative model for the volume of trade between countries. *Weltwirtschaftliches Archiv*, 93-100.
- Quartey, L. (2012, Wednesday, 29 February 2012 17:27). ECOWAS lagging behind SADC, EAC, COMESA in integration. *The African Report*. Retrieved from <http://www.theafricareport.com/WestAfrica/ecowas-lagging-behind-sadc-eac-comesa-in-integration.html>
- Rahman, M., Shadat, W. B., & Das, N. C. (2006). Trade potential in SAFTA: An application of augmented gravity model. *CPD occasional paper series*, 61, 512.
- Riley, S. P. (1998). The political economy of anti-corruption strategies in Africa. *The European Journal of Development Research*, 10(1), 129-159.
- Sandberg, H. M., Seale Jr, J. L., & Taylor, T. G. (2006). History, regionalism, and CARICOM trade: A gravity model analysis. *The Journal of Development Studies*, 42(5), 795-811.

- Santos Silva, J., & Tenreyro, S. (2011). poisson: Some convergence issues.
- Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *The review of economics and statistics*, 88(4), 641-658.
- Silva, J. S., & Tenreyro, S. (2010). On the existence of the maximum likelihood estimates in Poisson regression. *Economics Letters*, 107(2), 310-312.
- Silva, J. S., & Tenreyro, S. (2011). Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator. *Economics Letters*, 112(2), 220-222.
- Stack, M. M., & Pentecost, E. J. (2011). Regional integration and trade: A panel cointegration approach to estimating the gravity model. *The Journal of International Trade & Economic Development*, 20(1), 53-65.
- Thede, S., & Gustafson, N. Å. (2012). The multifaceted impact of corruption on international trade. *The World Economy*, 35(5), 651-666.
- Thede, S., & Gustafson, N. Å. (2012). The multifaceted impact of corruption on international trade. *The World Economy*, 35(5), 651-666.
- Thoumi, F. E. (1989). Bilateral trade flows and economic integration in Latin America and the Caribbean. *World development*, 17(3), 421-429.
- Tinbergen, J. (1962). An analysis of world trade flows. *Shaping the world economy*, 1-117.
- Tinbergen, J., & Hekscher, A. (1962). *Shaping the World Economy. Suggestions for an International Economic Policy.* [With Forew. By A. Hekscher]: Twentieth Century Fund.
- Unctadstat. (2017). United Nation Conference on Trade and Development Retrieved 24/06/2018 <http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=102>
- Van den Boogaerde, M. P., & Tsangarides, M. C. G. (2005). Ten years after the CFA franc devaluation: progress toward regional integration in the WAEMU: International Monetary Fund.
- Wane, M. A. A. (2004). Growth and convergence in WAEMU countries: International Monetary Fund.
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and statistics*, 69(6), 709-748.
- Winters, L. A. (2004). Trade liberalisation and economic performance: an overview. *The Economic Journal*, 114(493).
- W.T.O Report (2017). Trade, technology and jobs. (978-92-870-4361-0). from WTO Publications https://www.wto.org/english/res_e/booksp_e/world_trade_report17_e.pdf